# The influence of privacy perceptions on online shopping behavior – a comparison between millennials and baby boomers

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## ABSTRACT

**Purpose –** Privacy and security perceptions are growing topics in e-commerce. To develop a successful marketing strategy, it is crucial to know and address privacy concerns to prevent them from negatively influencing the online shopping behavior of customers. Perceived risk and trust are chosen to measure privacy perceptions. This study focuses on two generational cohorts, the millennials (18-24 years old) and baby boomers (55-65 years old). The aim of the research is to investigate differences in privacy perceptions influencing their online shopping behavior. The research question is answered by analyzing data from German respondents.

**Methodology –** Data is obtained with an online survey collecting 217 responses in Germany. The data is analyzed by independent t-test, regression analysis and ANCOVA analysis.

**Results & Conclusion –** The study reveals five main findings. Firstly, contrary to the previous assumption, trust has no significant influence on online shopping stable over age. Secondly, privacy risk is the strongest perceived risk among the respondents, however, it has no influence on their online shopping behavior. Thirdly, transaction risk has a significant negative influence on online shopping behavior for both generational cohorts. Fourthly, Source risk has a significant influence on online shipping behavior for both generational groups, but higher for baby boomers and lower for millennials. Lastly, baby boomers are more careful in their privacy behavior and their actual risk perceptions fit to their privacy behavior. The results show that transaction and source risk are the main influencers of online shopping behavior for both age groups, which should consequently be addressed in practice.

**Theoretical & Practical Implications –** This study strengthen the existing literature on the influence of risk and trust on online shopping. The added variable "generational cohorts" turn out to have a significant influence and thus, should be included in future research. For the retail industry the results implicate that especially transaction risk and source risk need to be addressed. This can be done by alignment of payment methods and visual design of the online shop.

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## Keywords

Privacy Perceptions, Perceived Risk, Perceived Trust, Online Shopping, Millennials, Baby Boomers

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# 1. INTRODUCTION

Nowadays, spending a day without access to the internet is inconceivable for most people of the Western world. The internet is part of our everyday life and for many actions we do not even recognize it anymore (Horrigan & Rainie, 2006). Online shopping is a rising topic in practice but also in research since the last decade (Lissista & Kol, 2016). It is simple, fast and comfortable and it is possible to order nearly everything via the internet (Jiang, Yang & Jun, 2013). Many brands offer their wares and services via an online shop additional to their retail shops and some even concentrate solely on e-commerce and close their retail shops (Bucksbaum, 2001). The main markets for online shopping are books, fashion and travelling (Bitkom, 2013) but also non-durable goods like groceries can be bought online (Benn, Webb, Chang & Reidy, 2015). The total number of people shopping online and the amount spent is expected to grow further. This has extensive and fundamental consequences for the whole retail market. Since online shopping is expected to further increase, many physical stores are closed. Many brands already focus completely on the online business. Due to online shopping, price pressure on retailers increases (Delafrooz, Paim & Khatibi, 2010). Current literature already did a lot of research on the topic of online shopping. There are several factors influencing the online shopping behavior, like the prior experience with the internet and online purchasing. Furthermore, income, product perception or customer service can influence the online shopping behavior (Jusoh & Ling, 2012).

Online shopping is a growing topic and the majority already prefer purchasing online instead of shopping in traditional retail stores (A.T. Kearney, 2015). However, privacy concerns are a rising problem in relation to online shopping (Milne, Rohm & Bahl, 2004). With every purchase, customers disclose private information to the selling company, like their name or address. In addition, online payment methods request private financial data, like credit card details, which people generally try to avoid to disclose online (Koyuncu & Bhattacharya, 2004).

Privacy is one of the greatest assets of many people. Privacy is needed to protect personal interests and to keep relationships trustful (Rachels, 1975). In the offline environment, it is easier to protect the own privacy. In the online environment, privacy protection is problematic due to the high complexity of technology and information overload (Rose, Khoo & Staub, 1999; Milne, Rohm & Bahl, 2004). Thus, privacy perceptions are assumed as highly influencing the online shopping behavior as people try to avoid behavior they perceive as risky. Current literature measures privacy perceptions in terms of risk and trust (Lou, Li, Zhang & Shim, 2010; Ling, Chai & Piew, 2010; Jusoh & Ling, 2012; Lee & Moon, 2015; Kim, Ferring & Rao, 2008). High perceptions of risk have a negative influence on online shopping behavior and high perceptions of trust have a positive influence on online shopping behavior.

This leads to the first part of the research question of this study:

*The influence of privacy perceptions on online shopping behavior.*

Additionally, this study includes the influence of a third variable, the "age", investigated in two generational cohorts. There are still different findings and opinions about the influence of age on online shopping in current literature (Zhou & Zhang, 2007). Some research findings indicate an association between age and online shopping behavior (Jusoh & Ling, 2012). Other authors find an influence of age on online shopping behavior, in fact younger people are more likely to purchase online (Khare, Khare & Singh, 2012). For marketing purposes, the predictors of specific behavior are important to evoke the target behavior in the customer. Thus, this study aims at revealing the role of privacy perceptions as one main predictor of online shopping, comparing its influence on online shopping behavior between two generational cohorts. The outcomes of this research will be important for designing marketing strategies that address and reduce privacy concerns and thus, increase the online shopping behavior of customers.

To analyze differences between age groups, this study compares the generational cohorts of millennials and baby boomers. Millennials (aged between 18-24) are regarded as "digital natives", technological savvy and experienced because they grow up with the internet and modern technology (Prensky, 2001. In traditional literature, baby boomers (aged between 55 and 65) are identified as the "digital immigrants", assumed to be less experienced an anxious regarding the use of internet as a purchasing tool (Prensky, 2001). However, recent literature indicates that baby boomers catch up and make use of the internet for several purposes, especially for online shopping (Beans, 2013). Both generational cohorts are of high interest for the retail market due to their size and high purchasing power (Parment, 2013).

This leads to the final the research question in this study:

***The influence of privacy perceptions on online shopping behavior - a comparison between millennials and baby boomers***

To answer this research question, this paper will follow a clear structure. In the theoretical framework, the findings of existing literate of all variables are summarized. After that, the relations between the variables are illustrated in the conceptual model. The operationalization and measurement of the variables are described. In the methods section, the data collection method is explained and the study is proved on validity and reliability. The main results are explained and the data is analyzed. The analysis is done with IBM SPSS Statistics Version 22. After the analysis, the outcomes are discussed and theoretical and practical implications are concluded. The limitations of this study and suggestions for further research are clarified. In the end, the findings and relevance of this study will be concluded.

# 2. THEORETICAL FRAMEWORK

## 2.1 Millennials vs. Non-Millennials

The use of generational cohorts instead of generations is more useful in analyzing markets (Schewe, Meredith & Noble, 2000). A generation is defined as 20-25 years, which is the time a person needs to grow up and get own children (Markert, 2004). Generational cohorts are based on dramatic events, which lead to changes in the behavior or values of people (Parment, 2013). This research will focus on the comparison of two generational cohorts: millennials and baby boomers.

### *2.1.1 Millennials*

The existing literature offers different age ranges for millennials. For some authors, the cohort spans 20 years and includes people born between 1975 and 1995 (Statistics Canada, 2007) or 1981-2000 (Ordun, 2015). Other authors define a shorter time span from 1981-1996 (Pew Research Center, 2015) or 1980-1994 (Bennett, Maton & Kervin, 2008). For the purpose of this study, the millennial age group is divided in early and late millennials and this paper only includes the early millennials born between 1992 and 1998, thus aged between 18 and 24 in 2016.

The millennials have different names like Generation Y (Parment, 2013), Digital Natives (Prensky, 2001) or Echo Boomers (Bracy, Bevill & Roach, 2010). Most of the people between 18 and 24 are currently at the end of their vocational

education or in the beginnings their working lives (Reisenwitz & Iyer, 2009). They are starting to achieve independence from their parents and move out of their parents' home (Bleemer, Brown, Lee & Van der Klaauw, 2014). In 2014, 28% are married and the median household income of a millennial is about $61,003 per year (Pew Research Center, 2015).

The millennials are highly educated (Bannon, Ford & Meltzer, 2011) and experienced good economic conditions while growing up (Duchscher & Cowin, 2004). Through the internationalization, globalization and emerging of new technologies, the millennials are characterized as the generation of growing opportunities. This is also supported by the increasing acceptance of e.g. new family structures, lifestyles or consumption behavior (Parment, 2013). They are fostered by their parents (Parment, 2013) to make individual choices and find their preferred way of living (Lester, Forman & Loyd, 2006). Millennials reflect on events, challenge traditional views and do not accept opinions set by authorities. Generally, they become confident and optimistic persons with a positive way of thinking in critical times (Kim, 2008). Millennials strive for independence (Parment, 2013), which is measured in terms of good education and income in this generation (Bleemer et al., 2014). Millennials seek recognition by others (Kim, 2008). Their life goals are based on a self-fulfilling and challenging job with high pay, but also on a good work/life balance and on a useful contribution to society (Schweitzer & Lyons, 2010).

The millennials grow up with technology (Kim, 2008) and are defined as the first high-tech generation (Prensky, 2001). With 95% (Pew Research Center, 2010), they are the generation with the highest internet use (Lenhart, Purcell, Smith & Zickuhr, 2010). Millennials are also named "digital natives" because they are connected to the internet for their whole lives and cannot imagine a life without it (Prensy, 2001). Millennials use the internet more than any other medium, like TV or radio (Lester, Forman, Loyd, 2006). Thus, they are confronted by an enormous amount of information every day and are better in handling these than older generations (Parment, 2013). Therefore, they become technological multi-taskers (Kim, 2008; Parment, 2013). 95% own a mobile phone (Pew Researcch Center, 2010) and are dependent on it in everyday situations (Parment, 2013) and become the "driving force of online communications" (Mangold & Smith, 2012, p. 3). Due to their intensive use of technology, millennials are the early adopters of new products (Ordun, 2015). The technology use is the most important factor that differentiate millennials from older generations (Pew Research Center, 2010).

### *2.1.2 Baby Boomer*

The Baby boomers are the largest generation (Duchscher & Cowin, 2004) and their time span is differently defined in literature. Some authors use a shorter time span from 1945-1958 (Parment, 2013), but the most typical one is the span from 1946-1964/1965 (Markert, 2004; Schewe, Meredith & Noble, 2000; Ordung, 2015). Sometimes, the generation is divided in early and late boomers (Markert, 2004) or leading-edge and trailing-edge boomers (Schewe, Meredith & Noble, 2000). For the purpose of this study, the younger baby boomers born between 1951 and 1966 (aged between 50 and 65 in 2016) are used.

The baby boomers are also called "digital immigrants" due to their technological experience (Prensky, 2001). The baby boomers already have work experience and fill high management positions (Kim, 2008). The median household income of an baby boomer is 65.843$. Most of the people in this generation live with their families. 66% are married, 16% divorced and 80% of female baby boomers have at least one child (Destatis, 2014). The baby boomers are the parents of the millennials generation (Ordun, 2015).

Baby boomers experience the beginnings of the internationalization in their youth. They have more opportunities than the generation before, e.g. in travelling (Parment, 2013). Thus, baby boomers appreciate mobility (Parment, 2013) and individualism (Schewe, Meredith & Noble, 2000). They are affected by immigration waves in Europe and experience cultural diversity (Parment, 2013). Generally, the baby boomers live in good economic times. However, especially the younger baby boomers experience economic fluctuations due to the Oil Shock in 1973. In contrast to earlier generations, the baby boomers like to spend their money instead of saving it (Schewe, Meredith & Noble, 2000). Baby boomers are hardworking and present a confident and optimistic nature (Kim, 2008).

Baby boomers did not grown up with technology, but they start to adopt it. They use information technology mostly for communication and research purposes (Kim, 2008). They are characterized with a "digital immigrant accent" which means that they use technology and the internet, but, compared to the millennials, it is not their first choice for every purpose (Prensky, 2001). However, baby boomers adopt to the main technical advances. In a study conducted by Pew Research (2010, 2011), 81% regularly use the internet and 86% have a mobile phone. They use their mobile phone for various purposes, but still to a lesser extent than the millennials (Sullivan & Hyun, 2016).

As literature indicates, the millennials and the baby boomers are two generational cohorts interesting for the retail market because of their size and purchasing power. Both generational groups share common values like individualism and optimism. The greatest difference is about technological expertise, distinguishing them in "digital natives" and "digital immigrants". However, current literature reveals that baby boomers catch up with the technological developments which might mitigate the effects of the immigration status of baby boomers when venturing into the millennials' native digital playground.

## 2.2 Online Shopping Behavior

### *2.2.1 Online Shopping Behavior*

In this study, online shopping behavior is examined in four dimensions: (1) experience, (2) shopping types, (3) online shopping behavior split into light versus heavy shopping, (4) advantages and disadvantages.

Literature provides mixed findings about the influence of experience on online shopping behavior. Dai, Forsythe and Kwon (2014) find that more experience in the field of online shopping leads to lower perceived risk concerning privacy and security. More experienced customers are more likely to purchase online (Ling, Chai & Piew, 2010). Other authors come up with contrary results, in fact that more experience lead to higher privacy concerns (Hoffman, Novak & Peralta, 1999; Miyazaki & Fernandez, 2001).

Online shoppers can be classified in three different groups. The *shopper* is someone who searches for product information online and then buys the product online as well (Soopramanien & Robertson, 2007). The *browser* is someone who searches for product information online, but actually buys the product in a retail store (Soopramanien & Robertson, 2007). The *showroomer* is someone who searches for product information in a retail store and physically examines the product before he

or she buys it in an online shop, mostly for price reasons (Dorman, 2013).

For the purpose of this study, online shopping behavior is split into light versus heavy shopper measured in frequency of online shopping, average spending, variety of products bought and variety of payment methods known and used. A heavy shopper is defined as someone who buys often, spends a high amount of money, buys various products and uses various online payment methods. Heavy shoppers perceive more risk, especially in terms of privacy issues. They spend more time in researching an online shop, e.g. about its trustworthiness. Heavy shoppers value trust in an online shop much more than light shoppers. In contrast, light shopper value a good price/value ration more than privacy conditions and trust (Chiou & Pan, 2009). Heavy shoppers have a tendency to be older, more experienced in the field of internet and online shopping and have a higher income. Men are more likely to be heavy shoppers than women (Forsythe & Shi, 2003).

The most important advantages of online shopping are convenience and time saving (Pate & Adams, 2013). Furthermore, better prices and the option of price comparisons are reasons for people to shop online. Other motivating factors are a higher variety of products, flexibility and a 24/7 shopping possibility, discreetness (Lester, Forman & Loyd, 2006), and the availability of reviews and recommendations (Wolfinbarger & Gill, 2001).

However, there are also factors preventing people from shopping online. The most important disadvantage is the missing possibility to test the physical product. Furthermore, the risk of online payment methods and added taxes are reasons against online shopping. The costs of delivery and the length of delivery time also prevent people from purchasing online (Lester, Forman & Loyd, 2006). Lastly, refund policies and problems with warranty and claims are disadvantages (Kacen, Hess & Chiang, 2013).

### *2.2.3 Online Shopping in Germany*

The e-commerce market in Germany is classified as established and growing with the fastest growing rate in Europe (Ben-Shabat, Moriarty, & Nilforoushan, 2015). Although the majority of purchases is still done in retail stores, 64% of Germans prefer buying online (A.T. Kearney, 2015). Germans spend 1½ hours per day searching on the world wide web. German people are knowledgeable and have a keen mind in relation to their online shopping behavior. They spend a lot of time for research and comparing prices before the actual purchase. Furthermore, they consider reviews and recommendations (Ben-Shabat, Moriarty, & Nilforoushan, 2015). In Germany, 92% of internet users have purchased online. For millennials, above-average 96% of internet users purchase online. A great proportion (89%) of internet users among the baby boomers use online shopping as a source of purchase (Bitkom, 2013). These data indicate that the baby boomers in Germany catch up with the millennials in terms of online shopping. The average German buys online 19 times a year with an average value of 63,76€ per purchase (RetailMeNot, 2015). The most favorite products bought online are books, fashion, tickets, music, travel and software. Millennials prefer to buy books and fashion, baby boomers prefer books and travel. The most used online payment methods among Germans are Paypal (and other online payment systems), direct debit, advance payment and credits card. Millennials mostly pay with direct debit or paypal. Baby boomers also pay with paypal, but also with credit card. The preferred payment methods is paypal for both age groups. In general, 87% of German show a browser and 71% a showroomer behavior. Millennials behave on average with 87% browser and 78% showroomer behavior. The browser behavior for baby boomers is similar (85%), but less than millennials for showroomer behavior (67%). Reviews and recommendations are important for the purchasing decision of Germans. In general, 73% read reviews, millennials even more (76%) and baby boomers slightly less (61%) (Bitkom, 2013).

Based on this data, one can say that millennials and baby boomers in Germany have some small differences in their online shopping behavior but are generally very similar. Both generational groups have a high purchasing power (Brown, 2016; GTAI, 2015) and are of great importance for the e-commerce market in Germany.

### *2.2.4 Millennials' Shopping Behavior*

Millennials are the most energetic consumer group in the internet (GTAI, 2015). They are increasingly dependent on technology for information search and purchasing of products. They are technologically savvy and expect fast online transactions (Harris, Stiles & Durocher, 2011). Within this generational group, the probability of people shopping online rises with age. Older millennials are more likely to shop online than younger ones (Lissitsa & Kol, 2016). Millennials are impulsive in their purchasing behavior. They make decisions very quickly (Lissitsa & Kol, 2016), mostly without physically examining the product (Ordun, 2015). They value a high speed transaction more than customer service and refuse human interaction during their shopping trip (Harris, Stiles & Durocher, 2011). On the other side, they value personalization in their online shopping experience (Hughes, 2008). Millennials are less brand loyal than other generational groups (Ordun, 2015) but consider reviews and recommendation for their shopping decisions (Mangold & Smith, 2012).

### *2.2.5 Baby Boomers' Shopping Behavior*

Baby boomers participate still less in online shopping than millennials, however, they increasingly recognize and use the internet as a source of shopping (Hughes, 2008). They use smartphones in their everyday live but also as a medium for shopping (Sllivan & Hyun, 2016). They make direct and rational shopping decisions. They know exactly what they want and organize their shopping trip. They trust on experts and friends when making shopping decisions (Hughes, 2008). Baby boomers value relationships to specific shops, they like brands and prefer shops with good reputations (Harris, Stiles & Durocher, 2011).

## 2.3 Privacy and Security Perceptions

Privacy perceptions are defined as "the willingness of consumers to share information over the Internet that allows purchases to be concluded" (Belanger, Hiller & Smith, 2002, p.248). Online shopping is perceived as a big opportunity, however, the technology behind the internet is complex and cannot be controlled by the user (Rose, Khoo & Staub, 1999). Thus, many consumers feel insecure about their private data and these privacy concerns have to be handled by e-commerce companies to retain a successful online market (Belanger, Hiller & Smith, 2002). This study measures privacy perceptions in terms of risk and trust.

### *2.3.1 Risk Perceptions*

Perceived risk is an often discussed topic in literature and research focuses on the influences on business for many years. Perceived risk can be measured in the magnitude of the negative consequences and the estimated probability of these consequences to follow a certain action or behavior. If the consequences of an action or behavior are drastic and likely to occur, people tend to avoid that behavior (Peter & Tarpey,

1975). Perceived risk directs consumer behavior because they want to prevent mistakes in the shopping process (Mitchell, 1999). Consumers perceive different kinds of risks in retail shopping (Kaplan, Szybillo & Jacoby, 1974). However, for online shopping new types of risks emerge. Perceived risk in online shopping is defined as the consumer's cognition about possible uncertain negative outcomes resulting from an online purchase (Kim, Ferrin & Rao, 2008) The perceived risks can be a reason for customers not do purchase online and thus, it is crucial for e-commerce companies to consider these risks (Kim, Ferrin & Rao, 2008). Since this study focuses on privacy perception, it will consider only the risks related to privacy: privacy risks, source risk, and transaction security risk (Lee & Moon, 2015).

Privacy risks is about the unknown collection of customer information, e.g. shopping habits (Lim, 2003) and the potential that online shops record and use personal data inappropriately (Nyshadham, 2000). The technology of the internet is a source for privacy risk. Consumers fear skimming of their private data due to hackers. Additionally, the online vendor is another source since the online shop itself can save private data of the consumer and sell it to third parties. According to Lim's research, customers read the privacy terms and conditions in only 10% of the cases. However, they also feel insecure if an online shop does not provide any privacy terms (Lim, 2003). Additional privacy risks are behavior tracking, which describes the analysis and storage of the customer's actions online, and spam mails (Wang, Lee & Wang, 1998).

Source risk is defined as the threat of purchasing from an unreliably and dubious online shop (Lim, 2003). If customers want to purchase from an online shop, they check if the website is reliable and real (Belanger, Hiller & Smith. 2002). Online vendors are the origin of source risk because customers fear that they give their private data to an unreliable online shop and that the product or service is not delivered after the transaction. Consumer perceive higher source risks in online shops which do not publish contact opportunities, like a contact person, phone number or address. Furthermore, customers in Lim's study often avoid overseas online shops because of high perceived source risk. Customers feel less risk with purchasing well-known online shops which are reputable or referenced by friends or family (Lim, 2003).

Transaction security risk is defined as the reluctance "to provide personal information such as credit card numbers to electronic commerce outlet" (Belanger, Hiller & Smith, 2002, p. 246). Customer most often use the credit card as the payment method (Lim, 2003). The sources of transaction security risk are the technology and the vendor. Customers fear that their computer does not process the transaction appropriately and shut down, fearing insecurity of their bank account information. Additionally, they perceive the risk of hackers stealing their bank account information or credit card details. Another financial risk comes from the vendor because unreliable online shops could not deliver the product after the financial transaction (Lim et al., 2003).

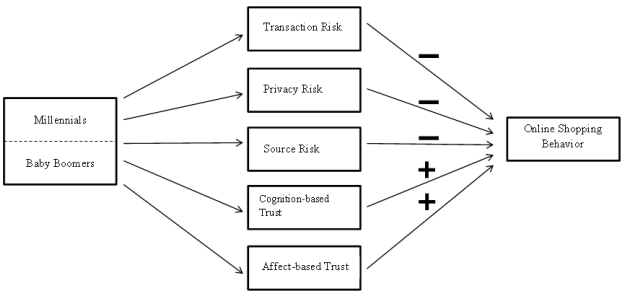
### *2.3.2 Trust Perceptions*

The basis of the perceived trust of a customer is the assumption that the seller treats the buyer in an appropriate and responsible way and without an exploitation of the situation for personal interests (Gefen, Karahanna & Straub, 2003). The level of trust has an effect on shopping behavior (Büttner & Göritz, 2008), however, in the circumstances of online shopping, trust plays an essential role. Customers have to trust the online shops because they do not have the possibility to test the product by themselves (Li, Jiang & Wu, 2014). Thus, the perceived level of trust is an important criterion for the final purchasing decision (Gupta, Yadav & Varadarajan, 2009; Hong & Cho, 2011). Additionally, trust is also a main determinant for re-purchasing decisions of customers and for helping to establish a good customer-seller relationship (Santos & Fernandes, 2008). On the other side, missing trust is the greatest factor restraining customer from purchasing online (Urban, Amyx & Lorenzon, 2009, p. 179). Thus, trust is an important issue to consider when measuring privacy perceptions and needs to be assessed by online shops for sustaining success.

Kim, Ferring and Rao (2008) developed a framework for measuring trust concerning online shopping behavior. They distinguish between cognition-based, affect-based, experience-based and personality-oriented trust. Cognition-based trust evolves from the general observation of the website and the resulting perceptions of the customer about the seller. When measuring cognition-based trust, three main sub-dimensions are important. Firstly, information quality determines if the customer finds enough information about products and the purchasing process on the website and thus, high information quality develops when the customer perceive the website as complete with correct and detailed information. Secondly, perceived privacy protection increases when the customer feels confident that the online shop will not use private information inappropriately. Thirdly, perceived security protection is defined as the perceived security measures the online shop takes to assure a save online transaction process. Affect-based trust is about the "indirect interaction" (Kim, Ferring, Rao, 2008, p. 6 ) with the seller by referring to opinions of others. In measuring affect-based trust, two sub-dimensions are important. The presence of third party seal is about certification the online shop attains and the positive reputation of selling party is about reviews and recommendations from others. Reviews from other customers have an impact on the perceived trust and reduce uncertainty for potential customers (Chen, 2008). Experience-based trust is about the personal past experience and prior knowledge about the online shop. Personality-oriented trust bases upon personal character traits about the development and the perception of trust in the shopping behavior. This study mainly focuses on cognition- and affect-based trust.

# 3. CONECEPTUAL MODEL

**Figure 1: Conceptual Model**




## 3.1 Variables

The independent variables are transaction, privacy and source risk and cognition-based and affect-based trust. These are meant to be predictors for the dependent variable, online shopping behavior. Current literature indicates a negative influence of the risk types and a positive influence of the trust types on online shopping

Online shopping behavior is divided light vs. heavy shopping, measuring frequency of online shopping, average spending, variety of products bought and variety of payment methods known and used.

Thus , the first part of the research questions is to assess in how far transactions risk, privacy risk, source risk, cognition-based trust and affect-based trust (summarized in privacy and security perceptions) influence the online shopping behavior. In the second part of the research question, differences between the generational groups millennials and baby boomers wants to be identified. The resulting research question this paper is dealing with is:

***The influence of privacy and security perceptions on online shopping behavior – a comparison between millennials and baby boomers***

# 4. OPERAZIONALIZATION AND MEASUREMENT

The questionnaire is divided into five sections: (1) demographics, (2) online shopping behavior, (3) privacy behavior, (4) risk perceptions (5) trust perceptions. The independent variables risk and trust are divided into different constructs (privacy, source, transaction risk; cognition-based, affect-based trust). These constructs are derived from Lee & Moon (2015) and Kim, Ferring & Rao (2008). Since the authors do not provide questions for their constructs, the items are developed by the authors of this study. The dependent variable, online shopping behavior, is measured in four main questions, developed for the purpose of this study. Demographics is treated as a control variable. Privacy behavior is not part of the direct research question but is also asked in the questionnaire for the purpose of comparing privacy perceptions with actual privacy behavior.

The survey is tested before publishing by independent people from all age groups. The survey is translated from English into German, Dutch and Chinese to manage all target groups. The translations are proved with a re-translation by an independent person. After these pre-tests, the survey is adjusted and published.

# 5. METHODOLOGY

## 5.1 Data Collection

The necessary data for this study is collected with an online survey constructed with Qualtrics. The survey is published via social media or email and answers are collected with a response rate of about 11%. All respondents do have access to the internet. The survey was open for 20 days, from May 5$^{th}$ till 24$^{th}$ 2016. In this time 856 responses are collected whereof 789 are completed and usable. In this study, the research question will be answered based on the data from German respondents in the age group 18-25 (millennials) and 50-65 (baby boomers). For this analysis, a total sample size of 217 responses is valid.

### *5.1.1 Sample Statistics*

The total sample size for the two age groups is 217 people. 58.5% (n=127) responses are from the millennials group and 41.5% (n=90) from the baby boomers group. The sample can be treated as equally sized. The mean of age in the millennials group is 20.13 years with a highest proportion of 18 years old respondents. The mean of age in the baby boomers group is 54.61 years with a highest proportion of 50 years old respondents.

In both age groups, the majority of respondents are female. For the millennials, 29% (n=37) are male and 71% (n=90) are female. For the baby boomers, 40% (N=36) are male and 60% (n=54) are female.

Concerning the current occupation, 82% (n=104) of the millennials group are students, the others are employed or self-employed (n=23). For the baby boomers group, 90% (n=77) of respondents are employed or self-employed. Six respondents are stay-at-home or retired each and one person is unemployed.

**Table 1: Overview of constructs and items**

| Construct | Definition | Items | Source |
|---|---|---|---|
| Privacy Risk | Perceived risk that the online shop save and use personal data inappropriately or sell it to third parties. | Risk_1: I believe that my personal information is protected during online shopping<br>Risk_2 I am aware that my private data can be given to 3rd parties by online shopping sites<br>Risk_3: I am aware that advertisement is based on my prior searches and shopping behavior<br>Risk_4: I receive newsletters/mails from online shops I did not register for | Lee & Moon, 2015 |
| Source Risk | Perceived risk that the online shop is fake or unreliable. | Risk_5: The possibility that online shops are fake is high<br>Risk_6: The possibility that my online purchase will not be delivered is high<br>Risk_7: I buy from online shops without a physical store | Lee & Moon, 2015 |
| Transaction Security Risk | Perceived risk that the online shop save and use financial data inappropriately, sell it to third parties and hacker attacks. | Risk_8: I am afraid to use my credit card online<br>Risk_9: The possibility that hackers will steal my credit card information is low<br>Risk_10: The possibility that my credit card information is sold to third parties is high<br>Risk_11: In general I trust mainstream online payment methods | Lee & Moon, 2015 |
| Cognition-based Trust | Perceived trust based on the observations and impressions of the online shop. | Trust_1: The product information I get in online shops is complete and understandable<br>Trust_2: Privacy policies in online shops are easily accessible and understandable<br>Trust_3: I expect mainstream online shops to fulfill basic digital security protection(s) | Kim, Ferring & Rao (2008) |
| Affect-based Trust | Perceived trust based on opinions from a third party (friends, reviews, certificates) | Trust_4: I check for safety logos and certification (eg. trusted e-shops) in online shops before I purchase.<br>Trust_5: I ask friends and family for recommendations of an online shop before I purchase<br>Trust_6: I read reviews of an online shop before I purchase | Kim, Ferring & Rao (2008) |
| Online Shopping Behavior | A heavy shopper is someone who buys often, spend a lot of money, buy various products online and know and use different payment methods. | Online_Shopping_7: How often did you shop online in the past year?<br>Online_Shopping_9:How much money do you spend on average per month for online shopping in Euros?<br>Sum_Products: What type of products do you usually buy online?<br>Sum_Paymethods: Which online payment methods do you know and use? | own definition for the purpose of this study |

## 5.2 Validity

Validity indicates if a study's measurement is correct for measuring what is aimed to be measured (Merriam, 1995). A factor analysis helps to investigate internal validity by testing if items belong together in measuring the same construct (Harman, 1967). Bartlett's Test is significant (p=.000) and the KMO is .643 which is acceptable to regard sample adequacy and the factor analysis as accurate (Dziuban & Shirkey, 1974).

**Table 2: KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,643 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 331,509 |
| | df | 55 |
| | Sig. | ,000 |

The factor matrix indicates that the variable risk is split in three factors. This is consistent with the measurement of the constructs since risk is divided into three risk types: transaction risk (factor 1), privacy risk (factor 4) and source risk (factor 3). The factor analysis proves validity of these risk types. Similarly, trust is divided in cognition-based and affect-based trust. However, the factor matrix shows that cognition-based trust is not valid. This could be due to the fact that cognition-based trust can be better measured with a specific website and not in a general context about online shopping. Thus, the items for cognition-based trust are deleted and the variable trust only consists of affect-based trust items (factor 2). Furthermore, the item Risk_1 is deleted because it cannot be assigned to any factor group, probably because the question is asked in a too general context. Risk_4 and Risk_7 are deleted due the fact that they measure actual risk instead of perceived risk. Factor loadings are all above .3 and thus moderately high and some are even above .6 and high according to Kline (2014). Additionally, each item is only assessed to one factor group. Summing up, a strong validity for this study can be assumed.

**Table 3: Factor Matrix**

| | Factor | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Risk_8 | ,598 | | | |
| Risk_9 | ,526 | | | |
| Risk_11 | ,521 | | | |
| Risk_10 | ,495 | | | |
| Trust_6 | | ,647 | | |
| Trust_4 | | ,567 | | |
| Trust_5 | | ,486 | | |
| Risk_5 | | | ,716 | |
| Risk_6 | | | ,435 | |
| Risk_2 | | | | ,639 |
| Risk_3 | | | | ,635 |

## 5.3 Reliability

An outcome is reliably when it is independent from the sample and a reproduction of the study would lead to the same outcome (Merriam, 1994). Reliability can be assessed with Cronbach's Alpha which measures the internal consistency between items (Cronbach, 1951). According to Hair, Black, Babin and Anderson (2010) Cronbach's Alpha indicates reliability when the value is above .6. For overall risk, the value is .606 and thus acceptable in terms of reliability. The Cronbach Alphas for transaction risk (.632), privacy risk (.555) and source risk (.562) are not high, but good enough to be acceptable for this study. For trust the value .575 which is close to 0,6 and thus acceptable for this study. For online shopping behavior, the Cronbach's Alpha is .644 and thus acceptable. The Cronbach's Alphas are relatively low because new items had to be constructed and are not validated by prior research due to the recency of this study.

**Table 4: Cronbach's Alpha**

| | Cronbach's Alpha | N of Items |
|---|---|---|
| Overall Risk | ,606 | 8 |
| Transaction Risk | ,632 | 4 |
| Privacy Risk | ,555 | 2 |
| Source Risk | ,562 | 2 |
| Trust | ,575 | 3 |
| Online Shopping Behavior | ,644 | 4 |

## 5.4 Survey Results

### *5.4.1 Online Shopping Behavior*

The online shopping questions measure different aspects: (1) Experience, (2) Shopping type, (3) Light vs. Heavy Shopping and (4) Advantages vs. Disadvantages. Thus, these aspects are divided into sub variables of the online shopping variable.

#### *5.4.1.1 Experience*

Millennials use the internet more often than baby boomers (p=.003). However, the baby boomers have more experience in online shopping (p=.02). Both age groups can be considered as mediate to highly experienced in terms of time of use. The fact that millennials use the internet more could indicate that they use the internet also for other online activities besides online shopping.

#### *5.4.1.2 Shopping Types*

There is no significant difference of the shopping types between millennials and baby boomers. Both generational groups rank the information search higher than the actual purchasing (p=.149; p<.001).

#### *5.4.1.3 Online Shopping Behavior (Light vs. Heavy Shopper)*

There is no significant difference between the two generational groups for the overall online shopping behavior (p=.8). Both millennials and baby boomers are considered as moderate online shoppers. The only difference within the overall shopping behavior is between the money spent. Baby boomers spend more money during online shopping that millennials do (p= .032).

#### *5.4.1.4 Advantages and Disadvantages*

Millennials and baby boomers do not mention substantially different advantages or disadvantages of online shopping. For millennials, the most important reasons for shopping online are convenience, variety of products and better prices. Baby boomers mention convenience, price comparison and better prices as the three most important reasons. Factors preventing millennials from shopping online are the missing physical product, high delivery costs and long delivery time. The baby boomers' reasons against online shopping are the missing physical product, high delivery costs and refund policies.

#### *5.4.1.5 Perceived Risk*

The perceived risk is measured in (1) privacy risk, (2) source risk, (3) transaction risk. When splitting the variable in the risk types, the General Linear Model indicates that privacy risk is the strongest perceived risk for both age groups (p<.001). Millennials rate privacy risk higher than baby boomers (p=.044)

#### *5.4.1.6 Perceived Trust*

The perceived trust is only measured in affect-based trust based on the results from the Factor Analysis. Both age groups

perceive cognition-based trust to a similar extent without significant differences (p=.507)

## 5.5 Survey Analysis

### *5.5.1 Correlations*

With the correlation table (see Appendix Table 8), the correlations between independent and dependent variable, but also in between the independent can be assessed. Gender is added as a control variable. Significant correlations can be found for:

- transaction risk has a weak negative correlation with online shopping, r(215)=-.277, p<.001
- source risk has a weak negative correlation with online shopping, r(215)=-.216, p=.001
- Men have a weakly higher online shopping behavior than women, r(215)=-.178, p=.008
- transaction risk and source risk have a weak positive correlation, r(215)=.326, p<.001
- source risk has a weak positive correlation with trust
- women perceive higher transaction risk than men (weak correlation), r(215)=.258, p<.001
- women perceive higher source risk (weak correlation), r(215)=.152, p=025

There are some correlations for the control variable gender, however, these correlation are weak and thus, gender is excluded from the further analysis.

### *5.5.2 Regression Analysis*

The model is tested with a regression analysis, analyzing the prediction of online shopping based on the independent variables transaction risk, privacy risk, source risk and trust (affect-based trust). The correlation table (see Appendix Table 9) shows a weak correlation for source risk and trust (p=.006, correlation coefficient =.187) and a moderate correlation between source risk and transaction risk (p<.001, correlation coefficient=.326).

10% of variance in online shopping can be predicted from the independent variables (Adjusted $R^2$=.100). Furthermore, the ANOVA analysis (see Appendix Table 9) indicates that the combination of the independent variables significantly predict online shopping (p<.01, F=6.970). Table 5 show the effects of the independent variables on online shopping. Trust (p=.013, Beta=.167) has a positive effect on online shopping. Transaction risk (p=.001, Beta =-.231) and source risk (p=.022, Beta =-.162) have a negative effect on online shopping. Except from privacy risk, all independent variables significantly contribute to the prediction of online shopping. Without the influence of these predictors, the online shopping value would increase to a mean of 2.857 (compared to 2.582). When looking at the Collinearity Statistics (see Appendix Table 12) it becomes obvious that that the tolerance for transaction risk and source risk are a bit too low. This is probably due to the moderate correlation between these two variables. However, the correlation is not very high and for the purpose of this study it does not make sense to combine them, the tolerance level is accepted and the variables are kept separated.

**Table 5: Coefficients explaining online shopping behavior**

| Model | | B | Std. Error | Beta | t | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 2,857 | ,337 | | 8,469 | ,000 |
| | Trust (Affect-based) | ,101 | ,040 | ,167 | 2,517 | ,013 |
| | Transaction Risk | -,166 | ,049 | -,231 | -3,353 | ,001 |
| | Privacy Risk | ,063 | ,043 | ,096 | 1,479 | ,141 |
| | Source Risk | -,120 | ,052 | -,162 | -2,303 | ,022 |

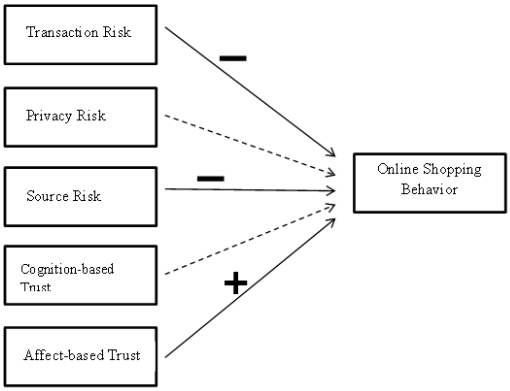



**Figure 2: Outcome Regression Analysis**

Thus, the outcome of the regression analysis is that trust, transaction risk and source risk are predictors of online shopping. Privacy risk has no influence on online shopping. In the further analysis, the variable age is added to identify differences between the millennials and baby boomer group.

### *5.5.3 Univariate ANCOVA Analysis*

After answering the first part of the research question, the age variable will be add to the analysis with an univariate ANCOVA analysis. With this, the relationship between the independent variables (trust, transaction risk, source risk and privacy risk) and the dependent variable online shopping will be assesses by adding age as a fixed factor. This gives insights if the in the regression analysis founded relationship is stable over age and shows possible differences between the generational groups.

With the ANCOVA main effects of the independent variables and interaction effects between each independent variable and age will be analyzed. Both tables below (Table 6+7) need to be considered. All independent variables do have significant influences on online shopping behavior (p<.05) (Table 6). The generational groups have no direct influence on online shopping behavior (F(1,205)=-1.588, p=.114), which supports the result from above that there is no difference between the generational cohorts concerning online shopping behavior. However, there is an interaction effect between generation and source risk (F(1,205)=2.371, p=.019). This indicates, that source risk influences online shopping behavior differently for the two age groups. Table 7 provides the strength and direction of the relationship. Trust and privacy risk loses its significance in the parameter estimates (F(1,205)=1.882, p=.061; F(1,205)=1.447, p=.149). This supports the findings from the regression analysis, that privacy risk is no predictor for online shopping. Based on the regression analysis, trust has been a predictor for online shopping, however, the ANCOVA shows that this relationship is not stable over age.

**Table 6: Between-Subject Effects**

Dependent Variable: HeavyShopping_Mean

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 18,907[a] | 9 | 2,101 | 4,214 | ,000 |
| Intercept | 34,165 | 1 | 34,165 | 68,527 | ,000 |
| Generation | 1,257 | 1 | 1,257 | 2,521 | ,114 |
| Trust (Affect-based) | 3,077 | 1 | 3,077 | 6,171 | ,014 |
| Transaction Risk | 6,598 | 1 | 6,598 | 13,234 | ,000 |
| Privacy Risk | 1,992 | 1 | 1,992 | 3,995 | ,047 |
| Source Risk | 3,360 | 1 | 3,360 | 6,740 | ,010 |
| Generation* Trust | ,181 | 1 | ,181 | ,362 | ,548 |
| Generation * Transaction Risk | ,418 | 1 | ,418 | ,838 | ,361 |
| Generation * Privacy Risk | ,002 | 1 | ,002 | ,003 | ,955 |
| Generation * Source Risk | 2,802 | 1 | 2,802 | 5,620 | ,019 |
| Error | 103,204 | 207 | ,499 | | |
| Total | 1568,563 | 217 | | | |
| Corrected Total | 122,111 | 216 | | | |

a. R Squared = ,155 (Adjusted R Squared = ,118)

**Table 7: Parameter Estimates**

| Parameter | B | Std. Error | t | Sig. | 95% Confidence Interval Lower Bound | 95% Confidence Interval Upper Bound |
|---|---|---|---|---|---|---|
| Intercept | 3,388 | ,492 | 6,880 | ,000 | 2,417 | 4,359 |
| Millennials | -1,090 | ,687 | -1,588 | ,114 | -2,444 | ,264 |
| Baby Boomers | 0 | . | . | . | . | . |
| Trust | ,132 | ,070 | 1,882 | ,061 | -,006 | ,271 |
| Transaction Risk | -,229 | ,079 | -2,922 | ,004 | -,384 | -,075 |
| Privacy Risk | ,085 | ,059 | 1,447 | ,149 | -,031 | ,201 |
| Source Risk | -,261 | ,078 | -3,356 | ,001 | -,415 | -,108 |
| Millennials * Trust | -,052 | ,086 | -,602 | ,548 | -,220 | ,117 |
| Baby Boomers * Trust | 0 | . | . | . | . | . |
| Millennials * Transaction Risk | ,092 | ,101 | ,915 | ,361 | -,106 | ,291 |
| Baby Boomers * Transaction Risk | 0 | . | . | . | . | . |
| Millennials * Privacy Risk | ,005 | ,087 | ,057 | ,955 | -,167 | ,177 |
| Baby Boomers * Privacy Risk | 0 | . | . | . | . | . |
| Millennials * Source Risk | ,249 | ,105 | 2,371 | ,019 | ,042 | ,457 |
| Baby Boomers* Source Risk | 0 | . | . | . | . | . |

Summing up, the outcomes of the ANCOVA analysis identify an influence of transaction risk and source risk on online shopping stable over age. Transaction risk influences both generational groups to the same extent in their online shopping behavior. For source risk, an interaction effect is identified. To detect the differences between the millennials and baby boomers, a scatter plot is built (see Appendix Figure 6). The scatter plot shows that source risk has a greater influence on the baby boomers than on the millennials. The graph for millennials is much flatter than for baby boomers, however, source risk has also a significant influence on millennials in their online shopping behavior.

### *5.5.4 Independent t-test for privacy behavior*

Besides the general research question, this study also measures the privacy behavior to control if there respondents behave according to their risk and trust perceptions. The privacy behavior is measured with questions about email accounts, passwords, and the handling with privacy policies and terms and conditions. An independent t-test identify significant differences between the two age groups ($p<.001$). Baby boomers show a higher privacy behavior than millennials, which means they are taking more actions to protect their privacy during online shopping. This outcome fits to the result from the ANCOVA analysis, since baby boomers are more influenced by source risk in their online shopping behavior.

## 6. DISCUSSION AND CONCLUSION

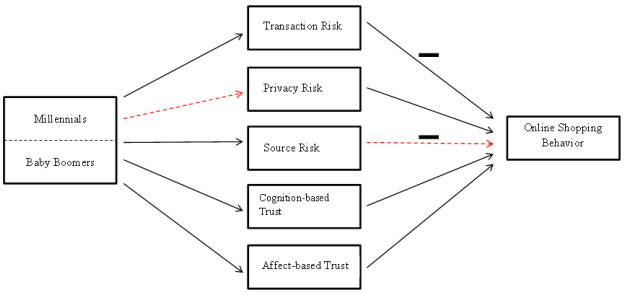



**Figure 3: Outcomes**

(red lines indicate a difference between millennials and baby boomers)

The aim of this study is to identify the influence of risk and trust on online shopping behavior compared between millennials and baby boomers. The first part of the research question is answered by a regression analysis. Based on the literature review we assume a negative influence of transaction, source and privacy risk and a positive influence of cognition-based and affect-based trust on the online shopping behavior. Cognition-based trust had to be excluded from this study based on the outcome of the factor analysis. A reason for this could be that cognition-based trust can be best measures based on one specific online shop. This study focuses on the general context of online shopping and obviously, respondents could not apply the cognition-based perspective to this context. Thus, the variable is not valid and excluded and trust is only measured in terms of affect-based trust. The outcome of the regression analysis shows, that this study can support prior research regarding the negative influence of transaction risk and source risk on online shopping. However, for privacy risk no significant influence can be found and thus, privacy risk cannot be treated as predictor for online shopping behavior. This is contradictory to the findings of Lim (2003), assuming that privacy risk has a negative influence on online shopping behavior. The findings in this study goes in line with the findings of Miyazaki and Fernandez (2001) who identify privacy risk as a main concern of internet users, but not as a predictor for online shopping.

For answering the second part of the research question, the comparison between millennials and baby boomers, an ANCOVA analysis is executed. It shows that transaction and source risk are the only predictors for online shopping which are stable over age.

***Finding 1: Trust has no significant influence on online shopping stable over age***

Affect-based trust has a significant influence on online shopping behavior, however, the influence of trust disappears when adding the generational groups to the analysis. This is contradictory to the findings of prior research (Kim, Ferrin & Rao, 2008; McCole, Ramsey & Williams, 2010) that trust has a positive influence on intention to shop online. Hsiao, Chuan-Chuan Lind and Wand (2010) find out that trust in a specific website increases the intention to purchase on that specific website, but has no influence on the intention to purchase online at all. This results could also explain the finding of this study because this research is done based on online shopping in a general context. As already assumed for cognition-based trust, the insignificance of trust in this research model could be due to this reason. In the case of online shopping, customer build affect-based trust by reading reviews, recommendations or checking certifications. Although reviews are important for both millennials and baby boomers, they do not always know if they are trustworthy and only influence the intention to buy for specific websites, but not online shopping in general (Hsiao, Chuan-Chuan Lind & Wand, 2010).

***Finding 2: Privacy risk is the strongest perceived risk among respondents but has no significant influence on the online shopping behavior***

In the results, data indicates that privacy risk is the strongest perceived risk for both millennials and baby boomers. Millennials perceive even higher privacy risk than baby boomers.

Surprisingly, privacy risk has no significant influence on online shopping behavior in the ANCOVA analysis, which fits to the outcome of the regression analysis. This is contradictory to the findings of prior research (Featherman, Miyazaki & Sprott, 2010) that privacy risk has a significant negative influence on intention to participate in online shopping. The result of this study supports the outcomes of Miyazaki and Fernandez (2001) that privacy risk is a main concern among internet users, but do not have an influence on their online shopping behavior. A reason for this could be that privacy risk is the most present risk and it is often discussed in media. People receive a lot of spam mails and thus, are in touch with privacy risk regularly. This could be the reason why privacy risk is the strongest perceived

risk by the respondents. However, privacy risk is simultaneously a vague risk, which differentiates it from source and transaction risk, which often have a direct influence on peoples' lives. Internet users know about the risk of personal data theft, however, they do not understand what happens to the data. There are mostly no direct consequences to the person and thus, privacy risk does not have an influence on their online shopping behavior.

***Finding 3: Transaction risk has a significant negative influence on online shopping behavior for both generational groups***

Transaction risk negatively influences the online shopping behavior of the two generational groups. Both age groups are similarly influenced by this type of risk. This outcome is coherent with the findings of Koyuncu and Bhattacharya (2004) about transaction risk reducing the intention to purchase online. Transaction risk often has direct financial consequences, e.g. when the credit card is charged by third parties. This risk is present to the customer every time he or she pays online. Both age groups are affected by this risk similarly because money is an important issue for both. The millennials group are mostly students, and thus, they mostly have no income and not much money to spend. The baby boomers, as the generational group with the highest purchasing power, spend more money during online shopping. Thus, both age groups fear financial losses due to online activities. For both age groups, PayPal is the most popular payment method.

***Finding 4: Source risk has a significant influence on online shopping, which is higher for baby boomers and lower for millennials***

Source risk significantly influences the online shopping behavior of both generational groups. This is coherent with the opinion of McCorkle (1990) who ascribe high importance to source risk. The interaction effect shows that baby boomers are more influenced by source risk in their online shopping behavior than millennials. The reason for the difference between the two generational groups could be that millennials make fast and impulsive purchases (Lissitsa & Kol, 2016) and thus, do not check an online shop carefully before purchasing. Furthermore, they are not as brand loyal as baby boomers (Ordun, 2015) and thus, tend to use various online shops and do not perceive a strong risk with new and unknown shops. The baby boomer generation is not as save as the millennials in dealing with technology (Prensky, 2001) and thus, they are more careful with unknown online shops. They make planned decisions and take their time to complete their purchasing transaction (Hughes, 2008). This could be a reason from them checking online shops more carefully to reduce their higher source risk.

***Finding 5: Baby boomers are more careful in their privacy behavior***

In the last analysis step, the actual privacy behavior is analyzed to see if the actual behavior fits to the prior perceptions of the respondents. Baby boomers take more actions to prevent their privacy in the context of online shopping. This outcome fits to the outcome that they are more influenced by source risk. Although millennials perceive higher privacy risk, they do not behave according to that. A reason for the inconsistency between perceptions and actual behavior for millennials could be that they are treated as the experienced "digital natives" , which gives them the feeling of safety and security in online activities. George (2004) offers an explanations for this behavior based on the theory of planned behavior. Confidence and self-efficacy in the context of online shopping increases the perceived control governance and thus, positively influences the online shopping behavior.

Furthermore, younger people are sometimes not aware of the consequences of their behavior. They often rely on their parents and are currently in the life stage where they learn to take responsibility for themselves. These could be reasons for their more frivolous behavior regarding privacy protection. Baby boomers are more careful in their privacy behavior because they did not grow up with the internet and are not used to it as the millennials. Thus, they cannot assess the consequences of their behavior to a full extent and take more actions to prevent their privacy.

## 6.1 Theoretical Implications

This research combines the framework of Lee & Moon (2015) about the perception of risk and the one of Kim, Ferring and Rao (2008) about the perception of trust. Compared to prior studies, this research isolate risk and trust from other factors influencing online shopping. Risk and trust are treated as individual and independent factors and thus, the dynamics between them are ignored. This could be the reason for the insignificant influence of trust on online shopping behavior. Gefen and Pavlou (2006) find out that trust has no direct linear effect on the intention to purchase online. Rather, trust is supposed to reduce perceived risk in online shopping (Pavlou & Gefen, 2004). The dynamics between risk and trust should be included in further research to develop a more specific framework for studying the influence on online shopping behavior. Furthermore, source risk is the type of risk often disregarded in current literature (Lim, 2003; Lee & Moon, 2015). This study underlies the assumption already made by McCorkle (1990) that source risk is the foundation of the other types of risks and significantly influencing the customer's decision process. Thus, this research implicates that source risk should be included in risk analysis for further studies.

This study aims at strengthen the existing research by including a new variable, the generational cohorts, to the relationship between privacy perceptions and online shopping behavior. Therefore, this study provides a summary of literature findings about main characteristics, technological skills and online shopping behavior of millennials and baby boomers. Since online shopping is a growing topic for both generational groups, these information can be used for future studies. The outcomes of the study show the main differences between millennials and baby boomers, and thus, between younger (18-14) and older (55-65) people and between children and their parents.

The internal validity is proved by the factor analysis and regarded as high. The research is conducted in a general context and not based on one industry or one specific company. However, the external validity is restricted to companies and online shops in Germany.

## 6.2 Practical Implications

The outcomes of this study will be particularly important for companies in the B2C sector operating in e-commerce. Nowadays, privacy perceptions is a growing topic and companies could develop a new competitive advantage with a marketing strategy addressing these new needs.

Until now, baby boomers are designated as the "digital immigrants". They are often underestimated and neglected in the context of online shopping. This study reveals that baby boomers purchase online to a similar extent as millennials. There is no significant difference between the online shopping behavior among the two generational groups. Thus, baby boomers should be considered as serious and relevant online shoppers. For the marketing department of a company targeting

the baby boomer generation, this means that marketing strategies should be expanded to the online environment. Baby boomers value customer service during their shopping experience (Parment, 2013). Thus, online shop should guide the baby boomer customer through the online shopping trip and offer contact possibilities. This can be done by providing FAQs, mail or telephone contact information or live chat possibilities. The millennials prefer personalization in their online shopping experiences (Hughes, 2008). Online shops can fulfill this need by sending personalized messages to the customer or recommend products based on past purchases. Online shops can exploit the full purchasing power by addressing the customer's needs during the online shopping process.

Although the online shopping behavior is similar, the outcomes of this study indicate, that millennials and baby boomers are differently influenced by perceived risk in their online shopping behavior. It is important to address the risks in marketing strategies to give the customer a feeling of security and prevent negative influences on their online shopping behavior.

Both generational groups are influenced by transaction risk. Practically, this means that they perceive high risks concerning online payment methods and the potential of financial data theft which has a negative influence on their online shopping behavior. Online shops could decrease transaction risk by offering money back guarantees and a wide range of payment methods to give the customer the possibility of choosing the one he or she feels most safe with. Additionally, offering offline payment methods, like purchase on account, could decrease the transaction risk and motivate people to spend more money on the particular online shop.

Source risk has a negative influence on online shopping behavior, particularly higher for baby boomers. To decrease this risk, websites need to be designed in a professional way which gives an impression of safety and security. To exploit the full purchasing power of the baby boomers, they need to feel save in the online environment. For the website design, 3 main factors are important: (1) information design, (2) navigation design, (3) visual design (Ganguly, Dash, Cry & Head, 2010). To improve information design, the company should provide contact information, but also details about the company itself, like history or ownership. Information design supports the decision process of a customer. Navigation design supports the feeling of ease of use. The customer has to find ones way on the website and needs to understand everything easily. Lastly, the visual design should not only be functional, but also attractive with appropriately chosen colors and pictures. A good visual design increases the perceived usability of the website. These three design factors decrease concerns and anxieties about the website and can thus, increase the online shopping behavior of customers.

Lastly, this study reveals that privacy risk is a high concern for both millennials and baby boomers, but especially millennials do not act according to that. This implicates that customer still need to be educated about online privacy. After disclose information to the online seller, he has the power and authority to keep the data safe. Nevertheless, also the customer can protect his or her privacy actively. Customers can protect themselves by technological safety systems, like firewalls and virus protection. Furthermore, during online shopping, customers can check for privacy policies, spyware data capture, cookies and third party sharing information. Customer can also try to reduce the amount of information disclosing to a limited extend or remove information as far as possible (Milne, Rohm & Bahl, 2004). If online shops clearly present these protection possibilities to the customer, privacy risk can be reduced because customer actively protect their own privacy.

## 6.3 Limitations

Due to the limited availability of time and resources, this study is based on a small sample of 217 respondents. A higher sample size would have probably led to more reliable and specific results

Additionally, this study could not make use of already tested and validated item questions for the survey and thus, the reliability of the results is reduced to a certain extent. Nevertheless, the values of Cronbach's Alpha are acceptable and thus, the data can be used to draw reliable conclusions.

Furthermore, this study investigates the predictors and influences on online shopping in a very general context. Some concepts of risk and especially trust could have yield more explicit results when applying it to a specific website. Based on the results of the factor analysis, cognition-based trust had to be excluded from the study, probably because respondents could not apply it to the general context of online shopping.

Another limitation, typical in researches using surveys, is social desirability. Furthermore, a pre-selection of the sample was done by only publishing the survey via the internet. Thus, all respondents are internet users, which also increases their probability to shop online.

Lastly, the research is based on German respondents and thus, the outcomes are only applicable to Germany.

## 6.4 Further Research

The outcomes of this study are only a small piece of the whole research on online shopping. There are many other factors which influence the online shopping behavior, but this study reveals that risk is a predictor and underlies the importance of segmenting into age groups. Since this research is based on the general context of online shopping, future research should test the framework on a specific website. Respondents are expected to give more precise answers to the questions with applying them to a website they know and use.

Furthermore, the comparison between the age groups should be further investigated. This study compares the millennials with the baby boomers. However, there are also other generational groups, which should be included to obtain a clear picture. This could lead to new segmentation opportunities.

Lastly, the possible interacting effect between risk and trust should be further investigated. There are several research findings about the dynamics between risk and trust (Pavlou & Gefen, 2004; McCole, Ramsey & Williams, 2010), which should be tested and included in the influence on online shopping.

## 6.5 Conclusion

This research has shown that both millennials and baby boomers should be considered as relevant online shoppers. To exploit the full purchasing power of both age groups, risks regarding online shopping need to be addressed. It is important for marketing strategies to reduce the risks before they can arise and influence the online shopper. Since privacy and security in e-commerce is still a complex construct and will probably gain increased attention in the future, education on this topic is important for both the marketer but also the customer.

## 7. ACKNOWLEDGEMENTS

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# 9. APPENDIX

## 9.1 Correlation Table

**Table 8: Correlation Table**

| | | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| Spearman's rho | 1. Online Shopping Behavior | Correlation Coefficient | 1,000 | | | | | |
| | | Sig. (2-tailed) | . | | | | | |
| | | N | 217 | | | | | |
| | 2. Transaction Risk | Correlation Coefficient | -,277 | 1,000 | | | | |
| | | Sig. (2-tailed) | ,000 | . | | | | |
| | | N | 217 | 217 | | | | |
| | 3. Privacy Risk | Correlation Coefficient | ,046 | ,038 | 1,000 | | | |
| | | Sig. (2-tailed) | ,498 | ,581 | . | | | |
| | | N | 217 | 217 | 217 | | | |
| | 4. Source Risk | Correlation Coefficient | -,216 | ,326 | ,098 | 1,000 | | |
| | | Sig. (2-tailed) | ,001 | ,000 | ,151 | . | | |
| | | N | 217 | 217 | 217 | 217 | | |
| | 5. Trust (Affect-based) | Correlation Coefficient | ,098 | ,098 | -,017 | ,187 | 1,000 | |
| | | Sig. (2-tailed) | ,149 | ,151 | ,807 | ,006 | . | |
| | | N | 217 | 217 | 217 | 217 | 217 | |
| | 6. Gender | Correlation Coefficient | -,178 | ,258 | ,088 | ,152 | ,057 | 1,000 |
| | | Sig. (2-tailed) | ,008 | ,000 | ,197 | ,025 | ,407 | . |
| | | N | 217 | 217 | 217 | 217 | 217 | 217 |

## 9.2 Regression Analysis

**Figure 4: Linear Regression for Risk**

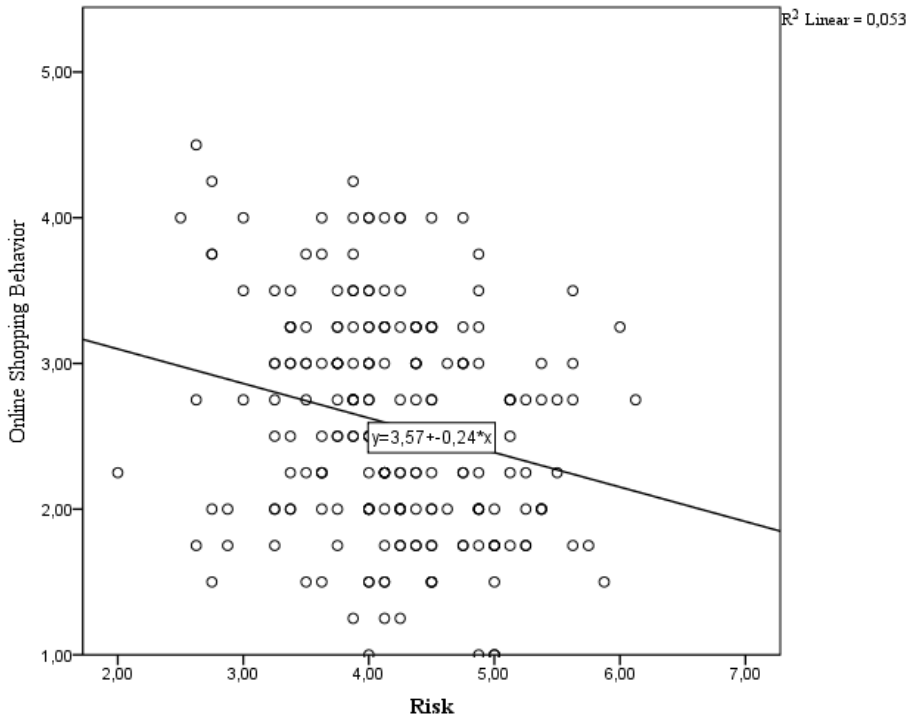


**Figure 5: Linear Regression for Trust**

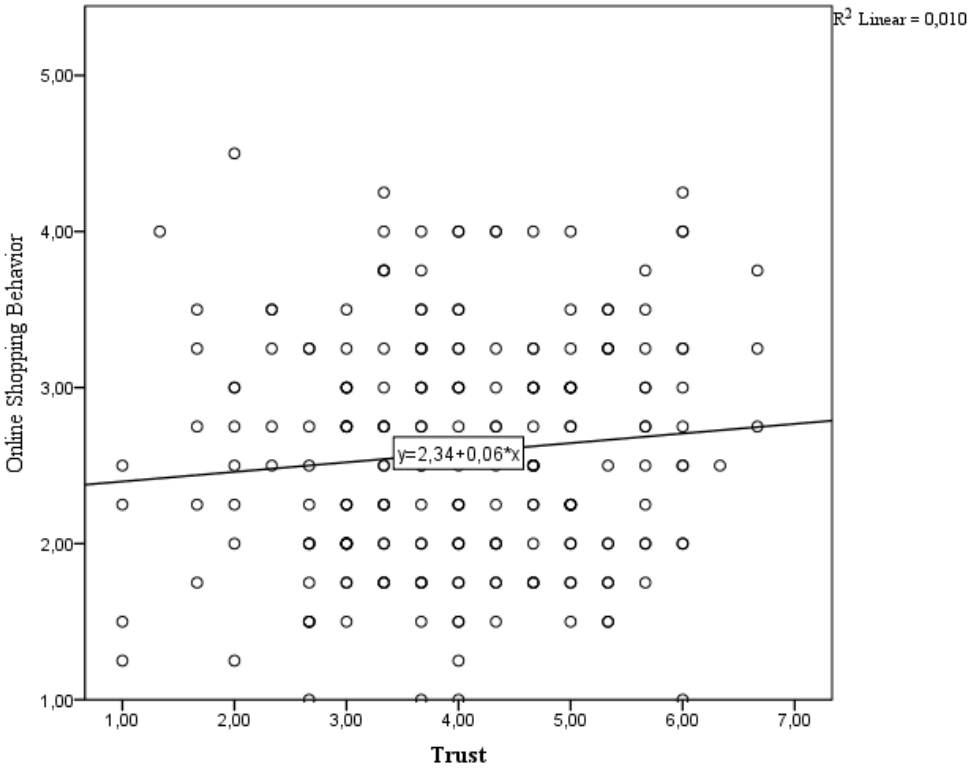



**Table 9: Correlations**

| | | Online Shopping Behavior | Risk | Trust |
|---|---|---|---|---|
| Pearson Correlation | Online Shopping Behavior | 1,000 | -,230 | ,102 |
| | Risk | -,230 | 1,000 | ,152 |
| | Trust | ,102 | ,152 | 1,000 |
| Sig. (1-tailed) | Online Shopping Behavior | . | ,000 | ,068 |
| | Risk | ,000 | . | ,013 |
| | Trust | ,068 | ,013 | . |
| N | Online Shopping Behavior | 217 | 217 | 217 |
| | Risk | 217 | 217 | 217 |
| | Trust | 217 | 217 | 217 |

**Table 10: Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | ,341 | ,116 | ,100 | ,71348 |

**Table 11: ANOVA**

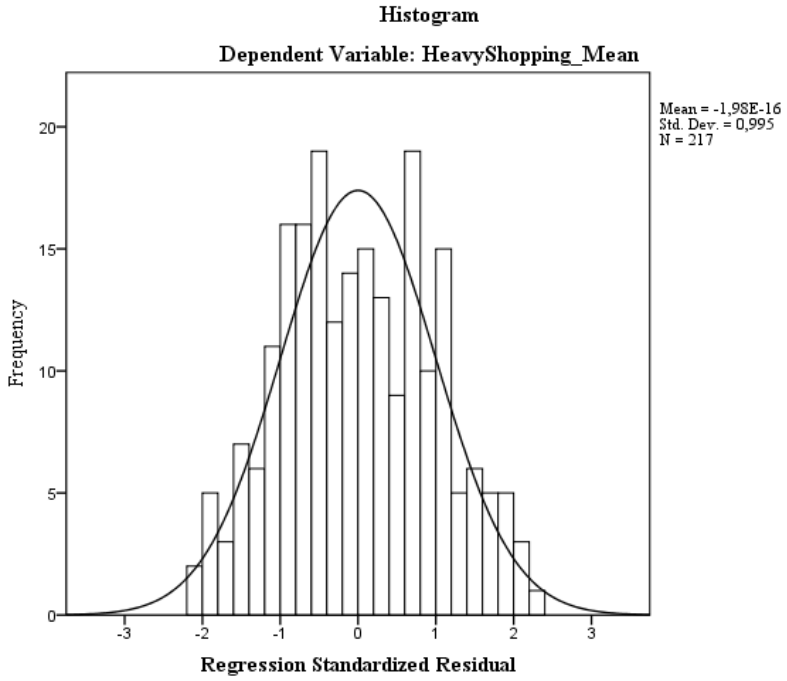
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 14,192 | 4 | 3,548 | 6,970 | ,000 |
| | Residual | 107,918 | 212 | ,509 | | |
| | Total | 122,111 | 216 | | | |

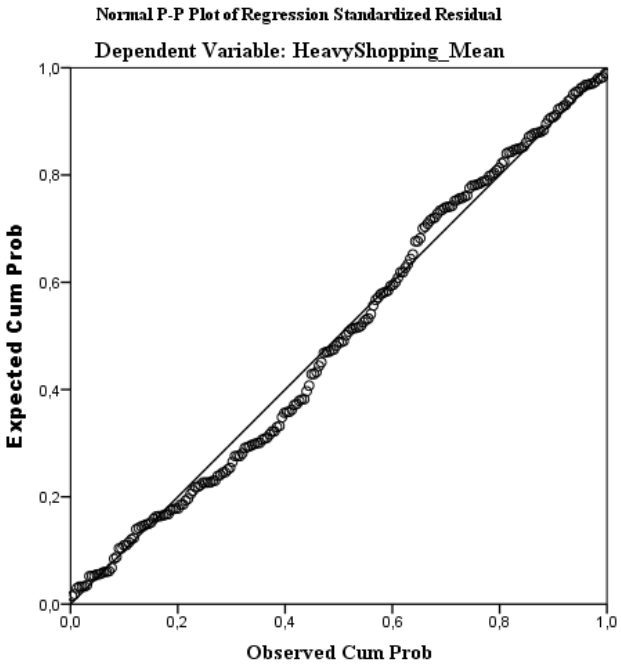
**Table 12: Coefficients**

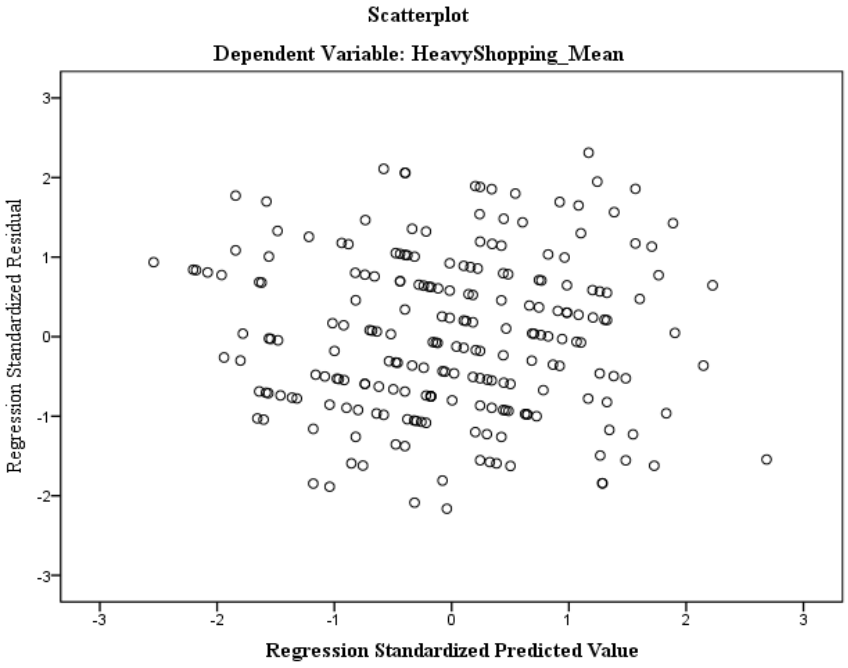
| | | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| Model | | B | Std. Error | Beta | t | Sig. | Tolerance | VIF |
| 1 | (Constant) | 2,857 | ,337 | | 8,469 | ,000 | | |
| | Trust | ,101 | ,040 | ,167 | 2,517 | ,013 | ,949 | 1,054 |
| | Transaction Risk | -,166 | ,049 | -,231 | -3,353 | ,001 | ,881 | 1,136 |
| | Privacy Risk | ,063 | ,043 | ,096 | 1,479 | ,141 | ,980 | 1,020 |
| | Source Risk | -,120 | ,052 | -,162 | -2,303 | ,022 | ,838 | 1,194 |

**Table 13: Residuals Statistics**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 2,0693 | 3,1234 | 2,5818 | ,20167 | 217 |
| Residual | -1,57356 | 1,68268 | ,00000 | ,72433 | 217 |
| Std. Predicted Value | -2,541 | 2,686 | ,000 | 1,000 | 217 |
| Std. Residual | -2,162 | 2,312 | ,000 | ,995 | 217 |

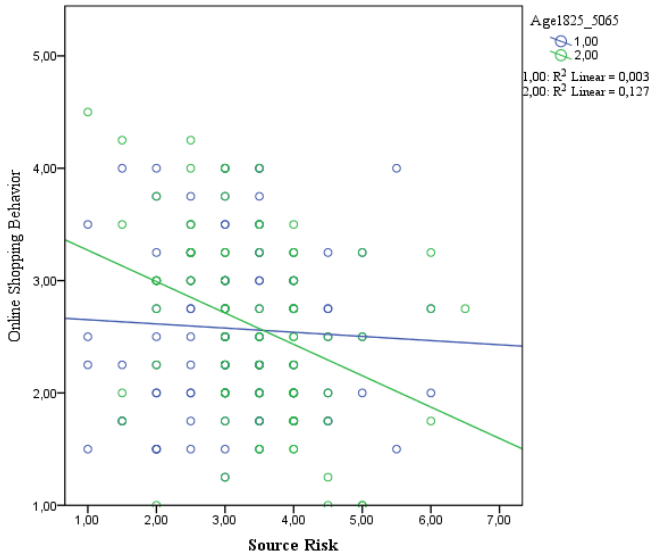



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: HeavyShopping_Mean
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: HeavyShopping_Mean
Regression Standardized Residual
Regression Standardized Predicted Value
-3
-2
-1
0
1
2
3

## 9.3 ANCOVA Analysis

**Figure 6: Scatter Plot Source Risk*Online Shopping**




## 9.4 Comparison Privacy Behavior

| | Generation | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Privacy Behavior | Millennials | 127 | 3,0602 | ,92719 | ,08228 |
| | Baby Boomers | 90 | 3,8865 | 1,10334 | ,11630 |

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Privacy Behavior | Equal variances assumed | 2,998 | ,085 | -5,974 | 215 | ,000 | -,82633 | ,13832 | -1,09896 | -,55369 |
| | Equal variances not assumed | | | -5,800 | 170,251 | ,000 | -,82633 | ,14246 | -1,10755 | -,54511 |

## 9.5 Survey Questions

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.

Q47 Page: 1/6

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

Demographics 2 What is you gender?

- Male (1)
- Female (2)

Demographics 3 What is your nationality?

- German (1)
- Dutch (2)
- Belgian (3)
- Chinese (4)
- Other (please fill in below) (5) _____

Demographics 4 What is your current occupation?

- Student (1)
- Employed (2)
- Self-employed (3)
- Unemployed (4)
- Retired (5)
- Stay-at-home (6)
- Unable to work (7)

Demographics 5 What is your highest education?

- Below High school (1)
- High school graduate (2)
- College graduate (8)
- Trade/technical/vocational training (3)
- Associate degree (4)
- Bachelor degree (5)
- Master degree (6)
- Doctorate degree (7)
- Professional degree (14)

Q48 Page: 2/6

Online Shopping 1 Online Shopping Behavior The following questions will help us to get to know your individual shopping behavior. Please answer openly and truthfullyClick on your most appropriate choice.

Online Shopping 2 How often do you use the Internet?

- Several times a day (4)
- Once a day (3)
- Several times a week (9)
- Once a week (6)
- Seldom (8)

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

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

- Less than 1 year (1)
- 1-3 years (2)
- 4 years or more (3)

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

- Never (1)
- 1 - 5 times a year (2)
- 6 - 10 times a year (3)
- Once a month (4)
- Several times a month (5)

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

- Fashion (1)
- Electronics & Software (2)
- Books, Music, Films etc. (3)
- Mobile Phone Apps (4)
- Health care/ Pharmaceutical products (5)
- Travel (6)
- Home and Garden (7)
- Sports (8)
- Motors (cars, equipment, etc.) (9)
- Groceries (10)
- Cosmetic products (12)
- Others (please fill in below) (11) _____

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

- 0-50 (1)
- 50-100 (2)
- 100-200 (3)
- 200-500 (4)
- 500+ (5)Online Shopping 10 Which online payment methods do you know and use? (multiple answers possible)

- Credit card (1)
- PayPal (2)
- iDeal (3)
- Klarna (4)
- Cash on delivery (5)
- Direct debit (6)
- In-app purchases (7)
- Digital wallet (8)
- Bitcoin (9)
- AliPay (10)
- Wechat (11)
- Other (please fill in below) (12) _____

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

- Credit card (1)
- PayPal (2)
- iDeal (3)
- Klarna (4)
- Cash on delivery (5)
- Direct debit (6)
- In-app purchases (7)
- Digital wallet (8)
- Bitcoin (9)
- AliPay (10)
- Wechat (11)
- Other (please fill in below) (12) _____

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

- Better prices (1)
- Convenience (2)
- Variety of products/brands (3)
- Flexibility (24/7 open) (4)
- Availability of reviews and recommendations (5)
- Discreteness of shopping (6)
- Price comparisons (8)
- Others (please fill in below) (7) _____

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

- Online Payment Methods (1)
- Added tax/ customs duty (2)
- High delivery costs (3)
- Long delivery time (4)
- Refund policies (5)
- Warranty & Claims (6)
- No physical product (intouchable, no real colours, no fitting etc.) (8)
- Others (please fill in below) (7) _____

Q49 Page: 3/6

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

- Yes, different ones for different purposes (online shopping, work, private etc.) (1)
- No, I have only one E-Mail account (2)

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

- Yes, a different one for each website (1)
- Yes, only a few websites with the same password (2)
- Yes, but several websites with the same password (3)
- No, the same password for each website (4)

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

- Image:Imgres (1)
- Image:Imgres 1 (2)
- Image:Imgres 1 (3)
- Image:Imgres 2 (4)
- Image:Imgres (7)
- Image:Imgres 3 (8)
- Image:Imgres (9)
- Image:屏幕快照2016 05 04 下午1.24.09 (10)
- Image:屏幕快照2016 05 04 下午1.24.15 (11)
- Other (name the logo) (12) _____

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 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

Q50 Page: 4/6

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) |
|---|---|---|---|---|---|---|---|
| Never:Always (1) | - | - | - | - | - | - | - |

Risk 5 The possibility that online shops are fake is high

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

Risk 7 I buy from online shops without a physical store

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

Risk 8 I am afraid to use my credit card online

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

Risk 11 In general I trust mainstream online payment methods

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

Q51 Page: 5/6

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

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

| | Entirely disagree (1) | Mostly disagree (2) | Somewhat disagree (3) | Neither agree nor disagree (4) | Somewhat agree (5) | Mostly agree (6) | Entirely agree (7) |
|---|---|---|---|---|---|---|---|
| (1) | - | - | - | - | - | - | - |

Q46 Have you ever had a bad experience with an online shop related to privacy and security concerns? Please share your experience below.

## 9.6 SPSS Syntax

```
* ================= *.
* Factor Analysis.
* ================= *.
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.

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.
* ================= *.
* RISK Reliability.
* ================= *.
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.

COMPUTE RiskMean=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.
* ================= *.
* TRUST Reliability
* ================= *.
```

```
RELIABILITY
  /VARIABLES=Trust_4_1 Trust_5_1 Trust_6_1
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.

COMPUTE TrustMean=MEAN (Trust_4_1, Trust_5_1, Trust_6_1).
EXECUTE.
* ================= *.
* RISK types
* ================= *.
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.

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.
COMPUTE AffectTrustMean=Mean (Trust_4_1, Trust_5_1, Trust_6_1).
EXECUTE.
* ================= *.
* Sample Statistics.
* ================= *.
FREQUENCIES VARIABLES=Age1825_5065
  /ORDER=ANALYSIS.
CROSSTABS
  /TABLES=Demographics_2 BY Age1825_5065
```

```
  /FORMAT=AVALUE TABLES
  /CELLS=COUNT
  /COUNT ROUND CELL.
CROSSTABS
  /TABLES=Demographics_4 BY Age1825_5065
  /FORMAT=AVALUE TABLES
  /CELLS=COUNT
  /COUNT ROUND CELL.
* ================= *.
* Heavy Shopping
* ================= *.
COMPUTE Sum_Products=SUM (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).
EXECUTE.
RECODE Sum_Products (1=1) (2=2) (3=3) (4=4) (5 thru 12=5).
EXECUTE.
COMPUTE Sum_Paymethods=SUM (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).
EXECUTE.
RECODE Sum_Paymethods (1=1) (2=2) (3=3) (4=4) (5 thru 12=5).
EXECUTE.
RELIABILITY
  /VARIABLES=Sum_Paymethods Sum_Products Online_Shopping_7 Online_Shopping_9
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.
COMPUTE HeavyShopping_Mean=MEAN (Online_Shopping_7, Online_Shopping_9, Sum_Products, Sum_Paymethods).
EXECUTE.
* ================= *.
* Correlation Table
* ================= *.
NONPAR CORR
  /VARIABLES=TrustMean TransactionRiskMean PrivacyRiskMean SourceRiskMean Demographics_2 DHeavyShopping_Mean
  /PRINT=SPEARMAN TWOTAIL NOSIG
  /MISSING=PAIRWISE.
* ================= *.
* Shopping Types
* ================= *.
RECODE Online_Shopping_3_1 Online_Shopping_4_1 Online_Shopping_5_1 (1=0) (2=1) (3=2) (4=3) (5=4)
    (6=5) (7=6).
EXECUTE.

COMPUTE INFO = (Online_Shopping_3_1+Online_Shopping_5_1)/2 - Online_Shopping_4_1 .
EXECUTE.
```

```
COMPUTE PURCHASE = (Online_Shopping_5_1+Online_Shopping_4_1)/2 - Online_Shopping_3_1.
EXECUTE.
* ================= *.
* Comparison Risk Types
* ================= *.
GLM TransactionRiskMean PrivacyRiskMean SourceRiskMean BY Age1825_5065
  /WSFACTOR=measures 3 Polynomial
  /METHOD=SSTYPE(3)
  /EMMEANS=TABLES(measures) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Age1825_5065*measures)  compare(Age1825_5065)
  /EMMEANS=TABLES(Age1825_5065*measures)  compare(measures)
  /CRITERIA=ALPHA(.05)
  /WSDESIGN=measures
  /DESIGN=Age1825_5065.
* ================= *.
* Comparison Risk & Trust
* ================= *.
COMPUTE Difference_Risk_Trust=RiskMean - TrustMean.
EXECUTE.
T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Difference_Risk_Trust
  /CRITERIA=CI(.95).
* ================= *.
* Results Online Shopping
* ================= *.
T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Online_Shopping_2
  /CRITERIA=CI(.95).

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Online_Shopping_6
  /CRITERIA=CI(.95).

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=INFO PURCHASE
  /CRITERIA=CI(.95).

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=HeavyShopping_Mean
  /CRITERIA=CI(.95).
* ================= *.
* Results Risk and Trust
* ================= *.
```

```
T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=PrivacyPercMean
  /CRITERIA=CI(.95).

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=RiskMean TrustMean
  /CRITERIA=CI(.95).

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Difference_Risk_Trust
  /CRITERIA=CI(.95).

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=TransactionRiskMean PrivacyRiskMean SourceRiskMean
  /CRITERIA=CI(.95).

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=CognitionTrustMean AffectTrustMean
  /CRITERIA=CI(.95).

* ================= *.
* Privacy behavior
* ================= *.
RECODE Privacy_behavior_1 (1=7) (2=1).
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_behavior_6_1, Privacy_behavior_7_1, Privacy_behavior_8_1).
EXECUTE.

T-TEST GROUPS=Age1825_5065(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=PrivacyBehavior
  /CRITERIA=CI(.95).
* ================= *.
* Regression Analysis
* ================= *.
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
```

```
  /DEPENDENT HeavyShopping_Mean
  /METHOD=ENTER RiskMean TrustMean
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID).
GLM PrivacyBehavior TrustMean RiskMean BY Age1825_5065
  /WSFACTOR=measures 3 Polynomial
  /METHOD=SSTYPE(3)
  /EMMEANS=TABLES(measures) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Age1825_5065*measures)  compare(Age1825_5065)
  /EMMEANS=TABLES(Age1825_5065*measures)  compare(measures)
  /CRITERIA=ALPHA(.05)
  /WSDESIGN=measures
  /DESIGN=Age1825_5065.
GLM INFO PURCHASE BY Age1825_5065
  /WSFACTOR=measures 2 Polynomial
  /METHOD=SSTYPE(3)
  /EMMEANS=TABLES(measures) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Age1825_5065*measures)  compare(Age1825_5065)
  /EMMEANS=TABLES(Age1825_5065*measures)  compare(measures)
  /CRITERIA=ALPHA(.05)
  /WSDESIGN=measures
  /DESIGN=Age1825_5065.


* ================= *.
* UNIANCOVA
* ================= *.
UNIANOVA HeavyShopping_Mean BY Age1825_5065 WITH TrustMean TransactionRiskMean
PrivacyRiskMean SourceRiskMean
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PRINT=DESCRIPTIVE PARAMETER
  /CRITERIA=ALPHA(.05)
  /DESIGN=Age1825_5065 TrustMean TransactionRiskMean PrivacyRiskMean SourceRiskMean
Age1825_5065*TrustMean Age1825_5065*TransactionRiskMean Age1825_5065*PrivacyRiskMean
Age1825_5065*SourceRiskMean.
* Chart Builder.
```