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### Security Risk and Social Presence in E-commerce

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## Security Risk and Social Presence in E-commerce

### Cover Page Footnote

Amy Wright graduated Butler University in May 2015 with a double degree in Accounting and Management Information Systems. While at Butler, she received the award for the top senior in her major, Management Information Systems. This research was conducted during her junior and senior years at Butler.

## **SECURITY RISK AND SOCIAL PRESENCE IN E-COMMERCE**

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MENTOR: HONGJIANG XU

### **Abstract**

The object is to investigate the relationship between consumers' sense of security of a store and their purchasing intention from the store. This was investigated by evaluating how perceptions of security vary among pure play websites with no social presence on the one hand and with social presence on the other; and click and mortar websites with no social presence on the one hand, and social presence on the other. It was also investigated by evaluating how social presence might mitigate the risk of security perceived by consumers. The research method included a scenario given to each participant which requires them to walk through a shopping purchase on a given website. Then the participant was given a survey where the participant will evaluate their perceptions of the shopping experience in regards to security, social presence, and intention to purchase. While there have been studies conducted about perceptions of security, none of these studies have looked at how the type of store, either click and mortar or pure play, impact perceptions of security and how social presence might mitigate negative perceptions. Our study concluded that perceptions of security risk and intention to make a purchase are inversely related, that is that the more risk one feels, the less likely they will have an intention to make a purchase. Our study also found that the type of store does not influence perceptions of security or intention to make a purchase. Social presence was also not found to influence perceptions of security or intention to make a purchase. Online shopping experience was found to influence perceptions of risk.

### **Introduction**

The internet has revolutionized many facets of life all around the world. One aspect of daily life that has changed is the way consumers buy and receive goods. This is referred to as electronic commerce, "the process of buying, selling, or exchanging products, services, or information via computer" (Turban, 2012). Many businesses have adapted to this new model, either adding an online website or creating an entirely new company only found online. Even today the internet is still dominated by the largest

retailers, even with new companies flooding the internet (Kolesar and Wayne, 2000). Currently, there are two main types of websites that sell goods. The first is a click and mortar website. This is a website that originally was just a physical retailer located in a place like a mall. Now this company can still be found in a physical store but also on the internet. Many companies have adapted to this business model in order to create two streams of revenue. The balance of these two forms of selling can be difficult to manage. Some companies choose to integrate the two worlds while others have two different systems for each stream of revenue (Turban, 2012). Companies must make sure that the creation of an online store front does not end up competing with their physical store fronts and must make sure that they are in accordance with one another. Some examples would be Walmart or Nordstrom. The other type of website for a typical consumer is referred to as a pure play website. This is a website that was created primarily for the internet. There is no physical store, just a website. These organizations generally have less overhead cost because it is much cheaper to have a virtual store front than a physical location. They can have just one warehouse that can ship directly to the customer instead of to a store first (Turban, 2012). Amazon is one of the most successful examples of a pure play store. Most companies have tried to enter the electronic commerce world, but for small boutiques it is sometimes very hard or impractical.

While both of these business models have proven to be profitable, they are perceived differently by consumers especially with trust. According to one of the senior vice presidents for UPS: "Consumers' expectations are rising, and online shoppers want to come as close as possible to getting the same kind of one-to-one personal attention they would receive at their favorite brick and mortar store." There are many forms of risk that can arise when a consumer makes an online purchase, including security risk, financial risk, and risk of spending too much time. (Flanagin et al., 2014). Perceptions of risk is part of the larger idea of trust. Trust is earned differently by online shopping rather than shopping in a store (Hernandez and Santos, 2010). An important risk that needs to be examined is security risk. Security risk has been a concern for consumers but this concern may vary by the type of website. The types of stores are different and people have different opportunities for interaction with the store. This may mean that customers may think of each store's security levels differently. Security risk is a real concern for online shoppers and is something that online websites should be concerned about. It is important to see what impacts security risk and what can mitigate risk so that online websites will know how to create a better shopping experience for consumers. However the perception of security risk

for a website might be mitigated by the introduction of social presence. Social presence is something on a website that is included to allow the consumer to have an actual, personal interaction with a salesperson on that website. (Zhang et al., 2011). This can include but is not limited to an online chat option or an avatar on the website. Intention to purchase is something that can be influenced by a variety of factors, including different risks (Chiu, 2014). Intention to purchase is ultimately what the online store desires from consumers and therefore its relation to risk is very important.

### **RESEARCH QUESTION**

This study is to address the issue of the lack of research examining how type of online store, and social presence impact consumers' security perceptions, and whether it further influence the intent to purchase. A lot of research has been done to develop a framework for security risks and how that may impact purchase intention (Schmidt and Chen and Phan, 2009). However nothing has been done to look at how the type of store and the social presence together influence perceptions of security risk.

The research question for this study is: Is the intention to purchase while shopping online influenced by perceptions of security risk which vary based on the type of website that the consumer is shopping at and the social presence of the website?

## **Literature Review**

### **E-COMMERCE TRUST**

Trust is something that greatly affects where and how people buy their goods. In general trust can be hard to gain on the internet because there is a lack of assurance (Kolesar and Galbraith, 2000). Regardless of how often one uses the internet, they still have the same overall perception of e-commerce trust (Schmidt *et al*, 2009). However trust does have a very huge role in e-commerce (Manafi *et al*, 2011). A new customer will judge a website by its trustworthiness (Al-maghrabi *et al*, 2011). The development based model for trust is the best way to explain the aspect of trust in regards to the buyer-seller relationship (Hernandez and Santos, 2010). This development based model has three sub-contracts. They are calculus-based, knowledge-based and identification. Calculus-based trust is evaluating trust based on calculating costs versus benefits. Knowledge-based trust is trust that is built after numerous interactions between the user and the website. Identification-

based trust is trust in the other party because one knows what the other party wants and who they are. Trust can be hard to achieve in regards to electronic commerce, since trust used to be built on personal interactions and face-to-face encounters. This application of trust can also be extended to mobile online shopping. A positive trust towards a mobile online shopping experience will lead to a decrease in perceived risk of buying on-line (Shuiging *et al.*, 2015).

### **RISK IN RELATION TO E-COMMERCE**

E-commerce risk is a part of a broader idea of consumer trust. E-commerce consumers' e-satisfaction is influenced by risk and emotional states, which then in turn creates loyalty to a specific website (Ltifi and Gharbi, 2012). Risk has two different levels that work together. One aspect of risk is the size of the problem that could be created and then how likely is it that this problem will actually happen (Dowling and Staelin, 1994). These two different dimensions work together to create either a high or low level of perceived risk. It is important to realize that risk is not one dimensional and is assessed differently by people. People will assign different magnitudes to each level risk and different probabilities of these risks.

Research has been done about a few types of risk that consumers face while engaging in online shopping. One risk that has been found to be very important is the risk of the loss of time. People do not want to waste their time on looking for something on a website. The point of shopping online is to find something quickly and easily. Additionally, it was found that in regards to e-satisfaction, financial risk was not a concern (Kim and Benbasat, 2010). People generally feel confident in the integrity of the company to deliver the product the way that they say they will, especially when the price is higher signifying quality. But financial risk does vary based on the consumer's wealth level. If the consumer does not value a minor monetary loss then financial risk will not be calculated into their overall risk level (Dowling and Staelin, 1994). Risk is also influenced by ratings about the website (Flanagin *et al.*, 2014). Consumers will do their research to look at average rating scores when evaluating the riskiness of a website. Further, in terms of the item being purchased, more risk is associated with sensory items (Sinha and Singh, 2014).

## **SECURITY RISK AS A RISK OF E-COMMERCE**

In an e-commerce environment, there are many avenues for consumers to experience risk. One area of risk that is a cause of great concern is security risk. Security risk refers to the threat of a security breach of personal information that people submit online. Uncertainty is a major concern for shoppers and has an impact on the amount of potential profit for an online retailer (Joonkyum and Bumsoo, 2014). It has been shown that security issues regarding both personal and financial information are one of the top concerns of internet users (Miyazaki and Fernandez, 2001). This concern is highest when a country's population has just began to have the opportunity of e-commerce (Muhannad and Ahmed, 2014).

Information security can be defined as “protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction” (Turban, 2012). There are different perceptions of aspects of security based on the individual's usage of the internet. A light user is someone who uses the internet no more than 15 hours per week while a heavy user is anyone who uses the internet more than 15 hours per week. Light users are better with password practices, perhaps because they are in general more cautious because they do not have as much awareness. Heavy users in turn are more informed about risk awareness and phishing awareness and are better about updating antivirus software. (Schmidt *et al.*, 2009). However increase of usage does not decrease overall perceptions of security risk. In order for people to complete a purchase online, they need to feel secure and feel that the risk is relatively low. There are regulations applied by governing bodies about online security, and specifically the security of information people provide in regards to e-commerce. Many people are not satisfied with these laws and think that they are not strict enough to fully protect their confidential information (Knezevic and Jakovic and Strugar, 2014). The idea of information security is very important because buyers will not desire to make purchases online if there are uncertainty perceptions due to the risk of security (Pavlou, 2007). However, there may be one way for online websites to mitigate perceptions of security risk and that is through the use of a social presence tool.

## **SOCIAL PRESENCE**

Companies utilizing e-commerce need to have alternatives to increase the consumers' trust and satisfaction compare to the traditional physical stores, because there are no face-to-face interactions. Online websites do not allow

for a customer to have an interaction with a real customer service representatives. However, there are certain ways for companies to recreate this physical interaction. One of these alternatives is social presence.

When a company uses real-time audio or audio-visual channels for communication, interpersonal trust will increase (Bente *et al.*, 2008). This would be something like providing an avatar or having a live online chat with a customer service representative. When a company specifically uses an avatar, a user will feel that there is a greater sense of social presence and purchase intention (Moon *et al.*, 2013). The avatar provides a real time conversation with the consumer and someone affiliated with the website. The use of a modern communication tool can help make the user experience more enjoyable (Al-maghrabi, *et al.*, 2011). Social presence can especially play an important role when examining consumer mood. Social presence can increase the mood of the customer which will then increase their intention to purchase (Zhang *et al.*, 2011). Social presence has been proven to greatly enhance the online shopping experience.

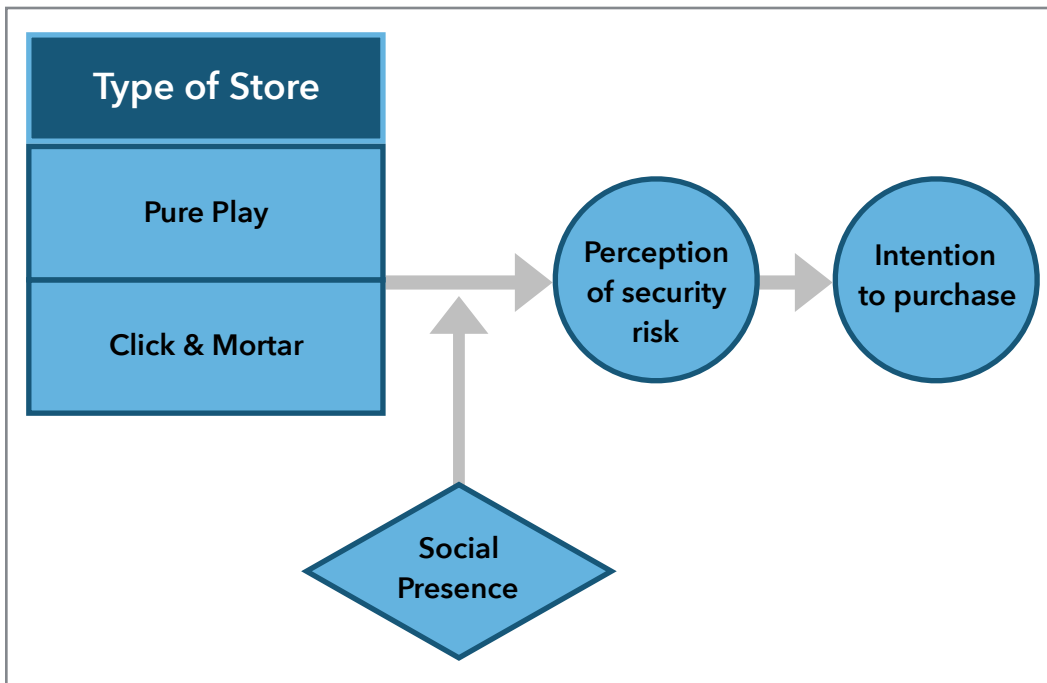
## **INTENTION TO PURCHASE**

In terms of shopping, intention to purchase is very important. Companies exist because of people actually purchasing goods from that company. Intention to purchase can be influenced by a variety of things including trust, usefulness, satisfaction, and risk (Dash and Saji, 2007). Overall satisfaction and attitude are something that influence intention to purchase. When a consumer has a positive experience with the online website and is satisfied, they are more likely to make a purchase and then to make a repeat purchase as well (Abdul-Muhmin, 2011). Not only is satisfaction important during the purchase, it is also important for the post-purchase phase for repeat purchase intention (Claudia, 2012). Risk is something else that negatively affects intention to purchase. However the effect can vary based on how much the consumer shops online. When a consumer is a heavy online shopper, risk will not influence intention to purchase as heavily as when a consumer is a light online shopper (Chiu, 2014). Trust has been found to be a mitigating relationship for purchase intention. When a consumer feels like they can trust the website, maybe due to good visual design or a highly informative website, they are more likely to make a purchase.



**RESEARCH FRAMEWORK**

This study examines online consumers’ perceived security risks and intention to purchase in regard to different types of shopping experiences. It examines how perceptions vary in regards to the type of store that the online consumer is using. This study investigates whether online consumers have different perceptions of risk for pure play and click and mortar type of e-commerce stores, whether an online store has incorporated social presence and whether these affect the consumers’ purchase intentions. Below is the proposed model of the type of store impacts perceptions of security and then ultimately affect the intention to purchase. This relationship is proposed to be mitigated by the use of social presence by the online stores.



**Figure 1.** Proposed model for how store type impacts perceptions of security and intention to purchase and how social presence may mitigate this relationship.

To investigate online consumers’ perceptions of security, this study looks at differing perceptions based on the type of website. As mentioned earlier, the two main categories of websites people can buy goods at are pure

play and click and mortar. The type of store is proposed to influence the consumer's perception of security. More specifically, a consumer will perceive more security risk when shopping on a pure play website than shopping on a click and mortar website.

One moderating variable in the relation of type of website and perceived risk is social presence. Social presence is how a company creates a personal interaction through the internet. The addition of a social presence tool is proposed to mitigate security perceptions. Adding a tool that allows consumers to have a personal interaction with the store will lower perceptions of security risk.

### Hypotheses

The following is a list of hypotheses derived from the research question and the research framework. Each of these hypotheses is discussed in details with supporting literature.

#### H1

There is a negative relationship between consumer perceptions about a website's security risk and their willingness to purchase a product from that website.

When an online shopping site has a higher perceived risk, the consumer might have a low intention to purchase on that website (Dash and Saji, 2007). Studies have found that if perceived uncertainty is high, then purchase intentions are negatively affected. If a consumer is buying something with a relatively high purchase involvement, then perceived uncertainty related to risk is higher, decreasing purchasing intentions even more (Pavlou *et al.*, 2007). Risk is an important issue consumers will think about before completing their purchase, with security risk being one of the aspects of risk. If there are security concerns, a buyer will not purchase online (Pavlou *et al.*, 2007). While there can be benefits to shopping online, there is also an aspect of increased risk, especially security risk because consumers can not personally see who is getting their information and what is being done with it.

Some stores online websites come after the presence of a physical store front, so a consumer may have been to the store at a mall and then he or she visits the website. However, online shopping is still a different experience

then shopping in a store. Research shows that if a company has perceived personal interaction, then they will have a lower perceived risk (Dash and Saji, 2007). Trust develops with touch, but in the world of e-commerce, there is no way for companies to provide a sense of touch. However, in terms of a click and mortar store, companies can offer “touch” through the physical store (Bente *et al.*, 2008). This perception of trust should extend to their online websites because customers may be able to recall a physical interaction previously encountered. Because of this, click and mortar sites might have a lower perceived security risk than pure-play stores. Finally, most pure play websites do not have any opportunity for social interaction. There is no opportunity for a face to face interaction and touch with the company. This might result in a high perception of security risk.

## H2

The purchase intentions of a customer will be higher in a click and mortar store than a pure-play website.

Attitude about websites has a strong influence on a customer’s intention to make an initial purchase and it also affects the intention to make a repeat purchase (Abdul-Muhmin, 2011). According to a study done on virtual malls, which is another broad form of internet shopping involving virtual worlds, perceived security did influence customers’ attitudes and therefore their intentions (Shin and Shin, 2011). Customers were more likely to make a purchase at a virtual mall if they felt that there was a high level of security. As mentioned, it is hypothesized that perceptions security is higher for click and mortar stores, when customers have the opportunity to make a purchase in person or online. The lower perception of security might be associated with pure-play. It has been found that the use of various shopping activities can positively influence how comfortable they feel (Dowling and Staelin, 1994). Not all shopping experiences are perceived the same and people have differing views of risk depending on where they are doing their shopping.

## H3

The addition of a social presence tool will mitigate security risk in online shopping. i.e. When there is a social presence tool on the website, perceived security risk will decrease.

One concept that might be relevant in understanding consumer perceptions of risk associated with e-commerce transactions is social

presence. Social presence helps lower a consumer's security risk (Pavlou *et al.*, 2007). Social presence is a way for companies to give customers a sense of personal interaction. A company with a high social presence can help that company provide a real life interaction with its customers. Social presence helps consumers feel like the information that a website reveals is true and an accurate representation of the product or service. It helps people feel more secure about their transaction. Perceived social presence has a direct impact on how customers perceive risk (Dash and Saji, 2007). Social presence helps with the moods of customers and purchase intention (Zhang *et al.*, 2011). Adding an online customer service opportunity is perceived as useful and can generally make the online shopping experience more enjoyable for the user (Al-maghrabi *et al.*, 2011).

Therefore, e-commerce companies can control social presence and help mitigate the problem of the lack of personal interactions on the internet. It has been found that consumers will feel that an online company has a higher social presence if the website offers a way for the customer to communicate directly with a customer service representative (Bente *et al.*, 2008). While e-commerce companies can offer an instant messaging system, another way to increase social presence is through the use of video or an avatar (Bente *et al.*, 2008) They could also use various online environments such as social media pages and virtual communities (Zhang *et al.*, 2012). The closer the website can get to recreate the personal interaction and the relationship established when people talk in person, the higher the social presence.

#### H4

When people perceive higher social presence, they will have higher purchase intentions. i.e. The use of a social presence tool on a website will lead to an increase in intention to make a purchase.

Social presence can not only impact perceptions of security risk but can also influence purchase intentions. As hypothesized earlier, security risk might have an inverse effect on intention to purchase. This study proposes that adding a social presence tool will therefore not only decrease perceived security risk but will also increase intention to purchase. As mentioned earlier, adding social presence has been found to decrease overall risk perceptions (Dash and Saji, 2007). Social presence has been found to positively influence trust and through positively influencing trust, intention to purchase has increased (Gefen and Straub, 2003). If companies want people to feel more comfortable, especially when there is no prior personal

interaction, they should look to add a line of communication. Companies can provide the opportunity for customers to feel a sense of social interaction with the help of social presence which will increase customer's intention to purchase.

## Research Method

### THE SURVEY

The research method used to collect data for this study was a survey questionnaire. A survey was used as this is the most common instrument used in studies about online shopping (Dash and Saji, 2011).

The survey included the descriptions of the different types of shopping experiences and questions regarding the survey respondents' feedback on that experience. This makes for a research design of random assignment to either manipulated independent variables or an experimental control. The sample population is college students. This group was chosen because the participants are very likely to have experience shopping online. Most surveys about online shopping use younger participants, generally college aged for their studies (Zhang *et al.*, 2011). College students often shop for themselves and most students are constantly connected to the internet. Also, college students are familiar with the concept of social presence because so much of what they do is online, and they have developed ways to decide if a website is trustworthy (Zhang *et al.*, 2011). Therefore, they are an acceptable group to survey. The group included a mix of females and males. It can be said with confidence that everyone in this group has at least minimal experience with shopping online, proven by survey answers.

Since this was an undergraduate research project, a convenience sample rather than a random sample is chosen. Students with different grades were asked to participate in the beginning of both lower and upper level classes as approved by their professors. Most of these surveys were completed during class time. Surveys were also completed at the end of various college student group meetings, including sorority and fraternity meetings. There was also an incentive to complete the survey. All students who completed the survey were entered into a drawing to win various gift cards to both Amazon and Starbucks.

This research involved 200 students at the researcher's institute, ranging in ages from 18 to 23 and grades freshmen to fifth-year senior. The

response rate was 90%, because most surveys were done in class and there was an incentive to complete the survey.

## **THE INSTRUMENT**

The research tool was a structured questionnaire, with the questions coming from various surveys that have been conducted about the online shopping experiences. All the measurement items were adapted from other studies. The survey instrument was examined by an expert in the field, and subsequently pilot tested on college students to make sure the survey was understandable.

The researcher developed four different scenarios of online shopping. Each participant read one of the scenarios and then was given a questionnaire about the described shopping experience. The scenarios were each four pages long and included both text and screen shot pictures of a website that was described as one selling an electronic device. The survey instrument included a scenario that either represented a pure play website, a pure play website with social presence, a click and mortar website, or a click and mortar website with social presence. The scenarios were all the same except for slight variations describing the type of website. Electronics are something that everyone buys regardless of gender. It is easy to find variations for electronics to be purchased. The first scenario has the user shop at a store that only has an online website and has no personal customer service online portal. The second scenario describes a web site for a store that also has a physical location. This website does not have a way for the customer to interact with representatives. The third scenario features a pure play website that has a social presence, which is a way for the customer to interact with people in the store. The fourth situation is similar to the third but the website described as a place that includes an online customer service help line.

The social presence in the scenarios was designed as an online chat system. The scenario provided a description along with pictures chronicling an online chat experience with a real time employee. The scenario had the participant asking various questions about the product being purchased with the employee answering all of the questions in detail.

The scenario walked the participant through a complete online transaction. For each website description, the participant was told that they are purchasing the same specific computer on an electronics website. They were told that they are completing the purchase all the way up until payment

was demanded. These scenarios will be randomly assigned to each subject, either websites with social presence or without. The subjects are not aware what the other situations are and will be led to believe that everyone is given the same situation.

Once the participant read through the scenario, they were asked to fill out a survey that included questions about security risk, information security, social presence, intention to purchase and trust. Because it is unlikely that all customers would actually purchase the type of good from one of the stores described, the questions can only examine if the customer would be willing to make a purchase. The survey then ended with demographic questions. All of the questions in the questionnaires are the same.

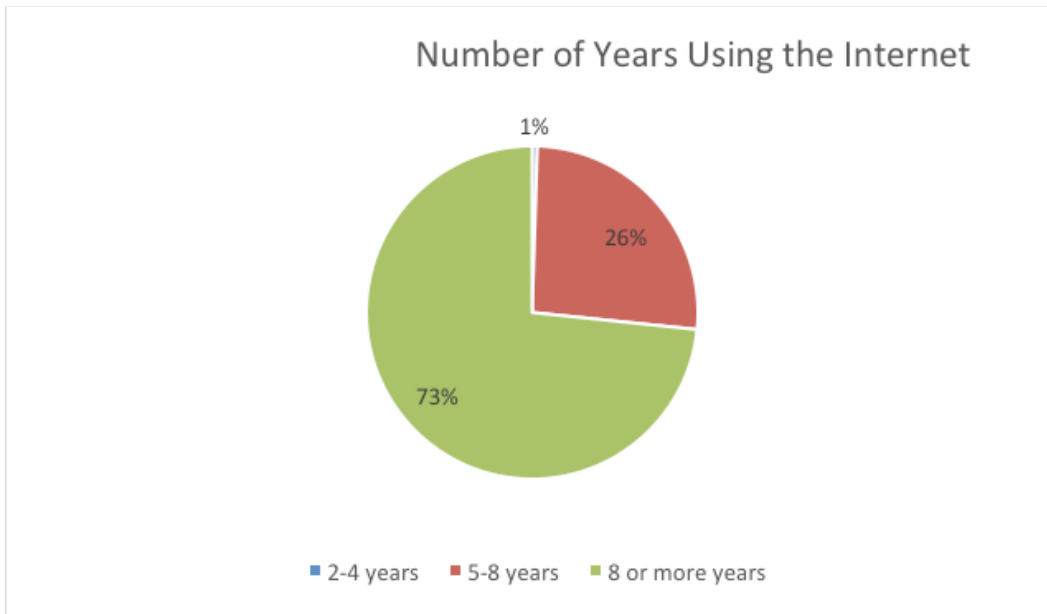
In conclusion, each participant was given a short scenario description. Then the participant was asked the same set of questions regarding their views about the shopping experience described.

## **SURVEY QUESTIONS**

Refer to the appendix for a listing of the survey questions used and an explanation as to how the questions were developed for the survey. All of the questions were adapted from previous studies. The questions are grouped together by the construct that is being tested to clarify what variable is being tested.

The survey concluded with a section asking questions about the participants' demographics. Age and gender are included on this survey like most other research study surveys. The next area asked about was internet usage. Because this survey is about online shopping it is important to ask how long the participant has been using the internet, how often they use the internet and why they use the internet. The final demographic questions were specific to online shopping experience and money spent online. It is important to examine the participants' experience with online shopping as this can influence their perceptions about the online shopping situation.

The scale used for the survey questions are a 5 likert scale which is a very common scale to use and the scale that was used for the questions originally. The five options were strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree, with 1 being strongly disagree and 5 being strongly agree.



**Chart 1.** Comparison of the number of years participants have used the internet.

### Data Analysis

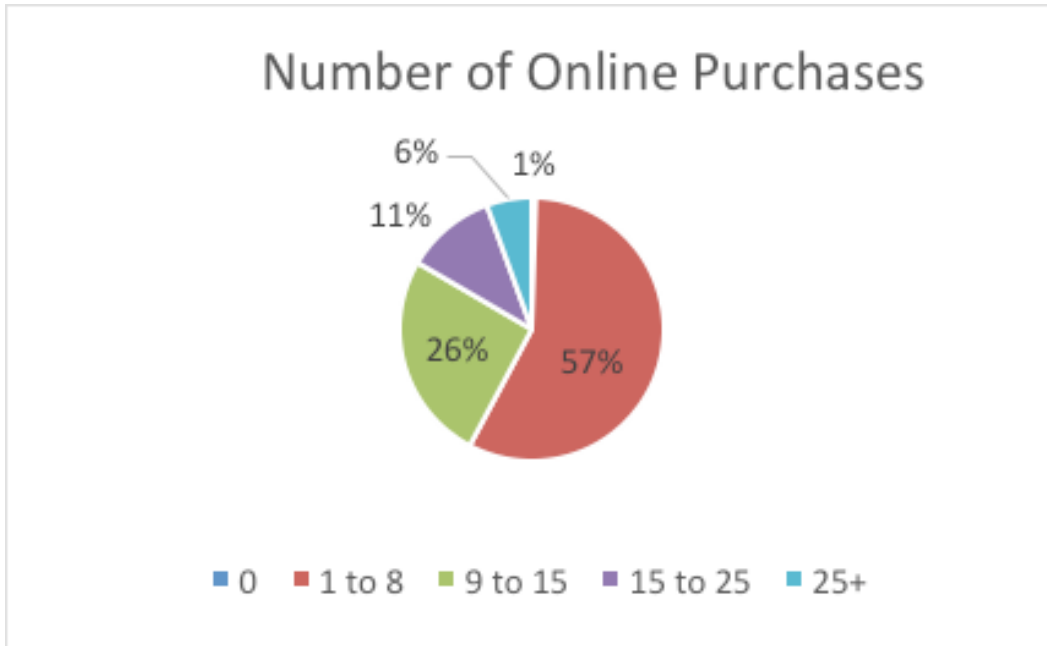
#### DESCRIPTIVE ANALYSIS

Participants were asked to answer a variety of demographic data questions. These questions were used for inferential analysis and as possible control variables. 13% of the participants were 18 years old, 15% of the participant were 19, 16% of the participants were 20, 29% of the participants were 21 and the remaining 26% were either 22 or 23 years old. In terms of gender, 41% of participants were female and 59% were male.

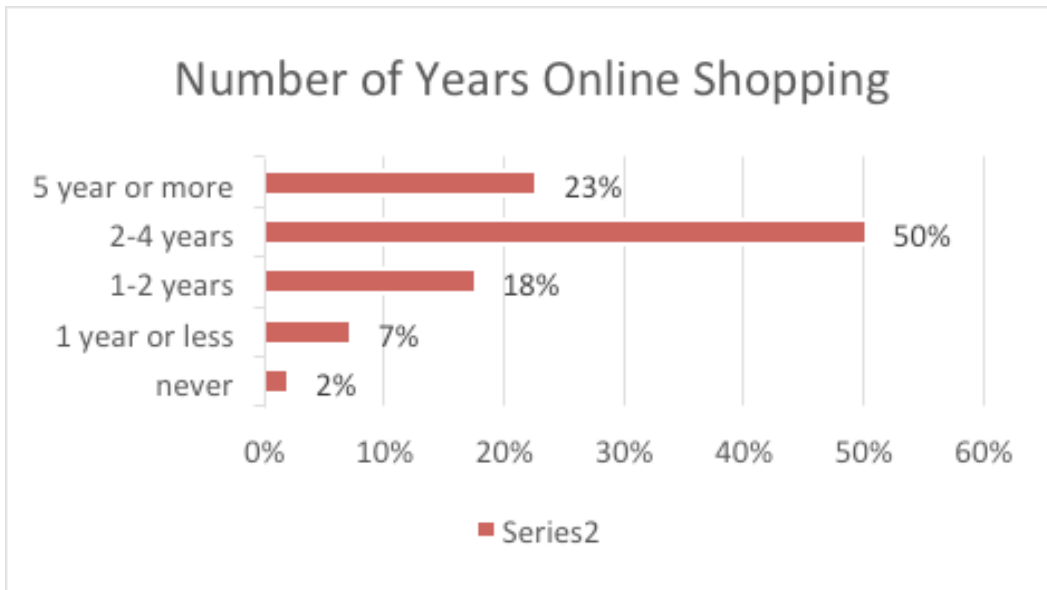
145 participants have been using the internet for over 8 years. 0.5% of participants use the internet less than once a week, 67.7% of participant use the internet over 12 times a week, 5% use the internet two to five times a week, and 25% use the internet six to twelve times a week. The majority of participants could be classified as heavy internet users, using the internet more than once a day. 69% of participants use the internet for shopping, school, entertainment, social media, and personal reasons.

In terms of online shopping, the majority of participants have been shopping online for two to four years, with the average number of yearly purchases being one to eight products. .5% of participants make zero





**Chart 2.** Comparison of the number of online purchases participants make yearly.



**Chart 3.** Comparison of the number of years participants have shopped online.

purchases per year, 57% of participants make one to eight purchases online per year, 25% of participants make 9 to 15 purchases per year, 11% of participants make 15 to 25 purchases online a year, and 5% make over 25 online purchases a year.

Another factor to consider about participants is their elastic income, or how much money they spend on items that are not a necessity. Participants who spend \$0 on unnecessary items represent 1%, participants who spend \$0-\$25 represent 21%, participants who spend \$25-\$50 represent 38%, participants who spend \$50-\$100 represent 24%, participants who spend \$100-\$250 represent 7.5%, participants who spend \$250-\$500 represent 8%, and participants who spend over 500 dollars represent 1.3%.

### **MANIPULATION CHECK**

In order to make assumptions about the data, it is important to make sure that the variables measured are valid and reliable. The following section will explain various tests that were used to confirm the validity of the data. One important construct validation for the survey is that adding social presence does impact how people feel about the online shopping as this is one of the key moderating variables. In order to test this, ANOVA was run with the dependent variables being feelings about social presence, and the fixed factor being whether the website had social presence or did not have social presence. When an online chat feature was added to a website description, it was found that there was more of a feeling of human interaction with a p-value of .000. Significance was also found between a feeling of friendliness and the type of store had a significance of .000. This shows that the survey did accurately portray a social presence outlet for online shoppers through an online chat system.

Normality of the data was tested using descriptive statistics in SPSS. The first set of data tested was the dependent variables of trust, intention and security when compared with store type. The second set of data was the same dependent variables but this time they were compared with and without social presence. While the Kolmogorov-Smirnov statistic revealed that the data may violate the assumption of normality at .000, this is common for a large sample size (Pallant, 2005). The histograms revealed that the scores are normally distributed. The Normal Q-Q plots also are plotted in a reasonably straight line.

The data must also be tested for multicollinearity. This will be tested using regression to find the variance inflation factor (VIF). When intention to

	Intention 1	Intention 2	Intention 3
<b>Intention_1</b>			
Pearson Correlation	1	.717**	.807**
Sig (2-tailed)	—	.000	.000
Sum of squares and cross-products	161.343	110.955	130.000
Covariance	.807	.555	.650
N	201	201	201
<b>Intention_2</b>			
Pearson Correlation	.717**	1	.786**
Sig (2-tailed)	.000	—	.000
Sum of squares and cross-products	110.955	148.368	121.333
Covariance	.555	.742	.607
N	201	201	201
<b>Intention_3</b>			
Pearson Correlation	.807**	.786**	1
Sig (2-tailed)	.000	.000	—
Sum of squares and cross-products	130.000	121.333	160.667
Covariance	.650	.607	.803
N	201	201	201

**Table 1.** Correlation of intention questions using the Pearson Correlation.

purchase is the dependent variable the VIF for social presence is 1.001 and the VIF for type of store is also 1.001. The normal threshold for VIF is below three so there is found to be no correlation between the variables.

All of the questions that have been used to assess intention, security and trust were analyzed using the reliability analysis. The reliability of the

scale for security only was .747 based on the Pearson Correlation. The reliability of the scale for intention only was the highest at .910, meaning that this scale was the most reliable. After checking the reliability of the scale for all of the variables as they all used the same scale, it can be determined that the scale was reliable for the present sample because the value is above .7 at .753 (Pallant, 2005).

Ultimately, this study is examining the purchase intentions of online shoppers and how intention can be influenced. The survey included three different questions asking about different areas of purchase intention. In order to confirm that these questions were valid, a correlation test was performed. Using a bivariate correlation test, it was found that all three questions were highly correlated, all with a Pearson correlation of over .7.

### **INFERENCEAL ANALYSIS**

The survey collected data about the participants and all these variables were tested to examine if they had an impact on risk and intention to purchase. Demographic questions were asked to accurately measure the population, and to see if there was any variance in demographic variables for any of the dependent variables. The inferential data analysis is used to further investigate additional relationships among the variables, and whether the results of this study could be applied to a larger population. The demographics tested were age, gender, experience with the internet, and experience with online shopping.

The only variable that was found to have an impact on risk and therefore intention to purchase was the online shopping experience of the participants. Online shopping experience was determined by the amount of years the participant has been conducting online shopping. When the number of years online shopping was the fixed factor and the dependent variable was trust, ANOVA analysis found that these two were not related. When the dependent variable was security risk, there was correlation between when the dependent variable was intention to purchase there was also correlation. This relationship will be explored later in this paper. Experience was also compared with both type of store and social presence in a MANOVA test. However there was not significant when looking at the impact on intention and trust.

Another type of experience with online shopping could be defined as the number of times one conducts online shopping. When number of online purchases per year is the fixed factor, there is a correlation between a

dependent variable of security risk as ANOVA analysis produces a  $p$  value of .006. However trust and intention are not affected by the number of purchases a participant has made online in the past year.

There was no significant difference between perceptions of male participants and female participants. ANOVA testing was run with gender being the factor. When trust was the dependent variable, the testing revealed a  $p$  value that was insignificant. When security risk was the dependent variable, ANOVA analysis produced non-significance for all security questions. Finally, when intention to purchase was the dependent variable, the  $p$  value was .134, therefore also insignificant.

There was no significant difference in perceptions of both trust, security and intention to purchase when age was the fixed factor in ANOVA analysis. The range of the participant's ages was quite small (18-24), which may have contributed to no significance. Grade was also tested to see if there was any significance. When grade was the fixed factor, there was no significance for both the dependent variables of security and intention with respective  $p$ -values of .420 and .695. Another test conducted was ANCOVA with age as the fixed factor and grade as the co-variate. With intention to purchase, age was still insignificant with a value of .787. With security, age was also still insignificant with a value of .191.

## **HYPOTHESIS TESTING**

The survey collected data about the participants and all these variables were tested to examine if they had an impact on risk and intention to purchase. Demographic questions were asked to accurately measure the population, and to see if there was any variance in demographic variables for any of the dependent variables. The inferential data analysis is used to further investigate additional relationships among the variables, and whether the results of this study could be applied to a larger population. The demographics tested were age, gender, experience with the internet, and experience with online shopping.

This study proposed five different hypotheses. All of these hypotheses were tested and analyzed below based on the data collected through the questionnaire.

## H1

There is a negative relationship between consumer perceptions about a website's security risk and their willingness to purchase a product from that website.

The first hypothesis was supported which states that there is a negative relationship between consumer perceptions about a website's security risk and their willingness to purchase a product from that website. In order to test this, the data was analyzed through ANOVA with intention to purchase as the dependent variable, with security perception being the fixed factor. With a significance value of .000, the null hypothesis is rejected. A Turkey post hoc test was performed to confirm the relationship. When comparing the intention to purchase of participants who felt the most security risk with participants who felt the least amount of security risk, the significance was .034, with the relationship being negative at a lower bound of the confidence interval of -2.8447 and an upper bound of -.0696. Therefore, the higher the risk, the lower the intention to purchase will be. Also, there is a relationship between the second lowest amount of security risk and the highest amount of security risk that had a significance value of .034. The lower bound is -2.3225 and the upper bound is -.1502. When people agree or strongly agree that their personal information is secure and there is no security risk, they do have a higher intention to purchase from the website. The perceived security of a website does heavily influence the intention to make a purchase on that website. Therefore, H1 one is accepted.

## H2

The perception of security risk in a click and mortar store is lower than a pure play store.

According to H2, the perception of security risk in a click and mortar store is lower than a pure play store is the second hypothesis. These variables were also tested with ANOVA, with the ANOVA test using type of store as the dependent variable and the fixed factor of store type. This analysis resulted in a *p* value of .0792. Therefore, the second hypothesis is rejected. Type of store was not proven to have a significant effect on perceptions of security risk through ANOVA testing.

### H3

The purchase intentions of a customer will be higher in a click and mortar store than a pure-play website.

As already described, the security risk does influence the purchase intentions. However the data showed that the perception of security risk is not influenced by the type of store. ANOVA testing was also completed to confirm whether intention to purchase also would not be influenced by type of store directly. When the type of store is the fixed factor and intention to purchase is the dependent variable, the  $p$  value is .111. This means that the relationship is not significant. Therefore store type was not found to influence a customer's intention to make a purchase on an online website. Hypothesis three is rejected

### H4

The addition of a social presence tool will mitigate security risk in online shopping.

It was found that adding an online chat feature to a website does increase the feeling of human contact in the transaction through an ANOVA test of a fixed factor of social presence with a significance of .000. Specifically, a chat system gives the user a more personal feel of the with a significance value of .014 and also a sense of friendliness with a significance value of .000. Therefore, if websites are concerned with the lack of human contact in a typical online shopping transaction, adding a customer chat feature with customer service representatives can mitigate that issue. However adding social presence to the online store through an online chat feature does not have an impact on the perception of security. Hypothesis H4 states that security risk will be lower if there is a communication tool in place. When analyzing the data of the impact of adding social presence to an online retailer on the perception of risk, the null hypothesis was accepted with a  $p$  value of .559 and an  $r^2$  value of .030, adjusted to .015. There is no relationship between security risk and social presence on an online shopping website. Because of this hypothesis four is rejected.

This relationship was also tested with the fixed factor of the type of store. When performing a MANOVA with the fixed factors of store type and social presence and the perception of security risk being the dependent variable, the  $p$  value is .096 causing the null hypothesis to be accepted. It is

therefore not significant what the type of store is or whether the store has social presence in terms of perceived security risk.

## H5

When people perceive higher social presence, they will have higher purchase intentions.

Even though the addition of a social presence tool does not impact security risk, it was still tested to see if there was an impact on purchase intentions. An ANOVA test was run with social presence being the fixed factor and intention to purchase being the dependent variable. The results were a  $p$  value of .356 and  $F$  value of .855, meaning that the relationship is not significant. There is no relationship between social presence and intention to purchase just as there is no relationship between social presence and perceptions of security risk.

For this hypothesis, another data analysis done was MANOVA testing with the store type and the aspect of social presence as the fixed factors and intention to purchase being the dependent variable. It was hypothesized that these two dependent variables would ultimately affect the intention to make a purchase from an online website. The data analysis produced a  $p$  value of .320 causing the null hypothesis to be accepted. The data shows that intention to purchase is not influenced by the combination of the variables of store type and social presence.

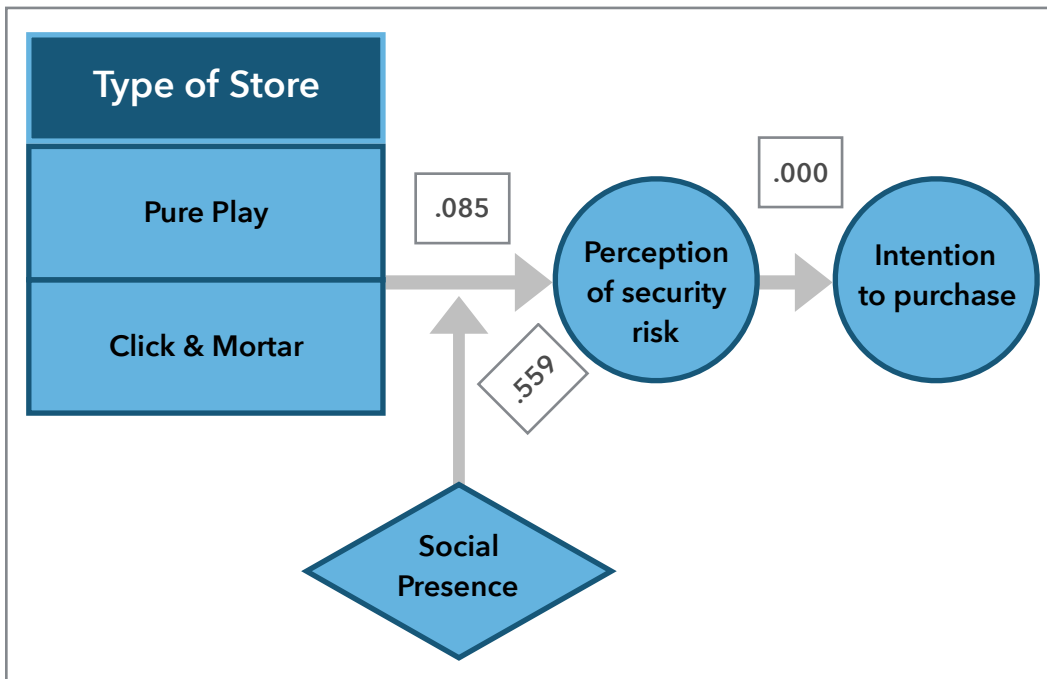
ANCOVA was also conducted with social presence as the covariate and store type as the fixed factor. Intention to purchase was the dependent variable. It was hypothesized that the use of a social presence tool would change the intention to purchase so social presence will be the covariate variable to separate the variable out. Again, both store type and social presence were found to be insignificant with  $p$  values of .325 and .104 respectively.

Based on the results of the data analysis, a revised model is proposed in figure three. Neither the type of store, the use of social presence nor the combination of both has an impact on the perception of security by a customer. However, perception of security is significant when looking at intention to purchase as a dependent variable of security. Upon further analysis of other factors that may influence security and therefore intention, it was found that experience plays a role in intention to purchase. This has led to a new model that examines how experience is related to security risk and intention to purchase. This was tested using both ANOVA and ANCOVA.



As part of the general demographical information collected from the research, participants of the survey were asked to describe their experience with online shopping in terms of the years they have been online shopping for. With the dependent variable of security, the fixed factor of online shopping experience returns a  $p$  value of .016. Using Fishers Least Significant Difference (LSD) analysis, it shows that there is an inverse relationship between participants having the most years of online shopping experience and having either never shopped online or been shopping online for less than one year. With more online shopping experience, participants perceive higher level of security from online shopping.

More specifically, if someone has over five years of experience of online shopping, they are more likely to feel comfortable with the security on the website. Between a one (never online shop) and a five (shop over five years), the value was .012 and the lower bound of the confidence interval was negative. Between a two (less than one year shopping online) and a five (online shop over five years), the  $p$  value was .017 with the lower bound of the confidence interval negative.



**Figure 2.** Proposed research model of online consumers’ perception of e-commerce security risk and consumers’ intent to purchase with ANOVA significance values.

ANCOVA analysis was also completed with online shopping experience as the covariate variable and the dependent variable of intention to purchase and the fixed factor of type of store. Online shopping experience was found to be significant with a value of .004. Also, the  $p$ -value for type of store decreased, therefore becoming more significant with a value of .081.

### Discussion

From our data analysis, H2, H3, H4, and H5 were not supported, but H1 was supported. In addition, this modified research model includes a new variable of online shopping experience. Even though online shopping experience was not originally included in the research model and hypotheses, it was part of the important demographic information collected from the survey, as the possible control variables. This variable of online shopping experience was tested as a mediation possibility through ANOVA testing and was found to influence the perception of security risk different participants had, as discussed earlier.

Only the first hypothesis was found to be true, which stated that intention to purchase on a website will be negatively affected as the perception of security risk increases. Security risk is still a valid concern for online shoppers. This is important because it was found to influence whether a purchase will actually take place. Even though the internet has been around for many years now, security is still an issue. Data breaches are still just as common and still pose a legitimate threat to online shoppers. If someone does not feel comfortable with the security of an online website, they will not complete their purchase and will look to other sources to buy what they may be looking for. The greater the perceived security risk, the less likely a purchase will be made.

The type of store does not have influence on perceived security risk, or intention to purchase. The amount of online shopping experience has been proven to impact how people view their online shopping experience and ultimately can shape their intention to purchase. The results of this study indicated that the number of years of experience the survey participant has online shopping influences the perception of security risk of online shopping. This was confirmed by the use of ANOVA and ANCOVA statistical testing. This variable was originally left out of the hypothesis but is one that cannot be overlooked.

When it comes to online shopping, perceptions can be influenced by a variety of aspects. One of the main aspects is experience. Experience with the internet in general can affect security perceptions. The more experience one has with the internet, the fewer the concerns about information security will be (Miyazaki and Fernandez, 2001). People who have varying levels of experience shopping online look to different aspects of websites to decide if they would like to make a purchase on that particular website. In particular, those with less shopping experience value security more than those who have normal or high levels of experience (Bhatt and Bhatt, 2012).

One of the reasons that experience has influence in security perceptions is the theory of attitude formation, which explains that direct experience reinforces beliefs about a particular thing. In terms of online shopping, this attitude-intention relationship of making a purchase is strongest with the user has previous experience (Crespo *et al.*, 2009). Different studies have been done to decide how much experience is truly needed to say that the customer has experience with online shopping. It has been found that for the greatest impact, the customer should have at least four years of online shopping experience (Bertea and Zait, 2013).

Before conducting research, the hypotheses were formed in regards to prior research. The finding from some of these prior researches were not supported by the findings of this study for a variety of reasons. In the research done by Dash and Saji, they found that with a perceived personal interaction, a company will have better trust. This study involved an older age group, with most people being in their late twenties, but also having participants who were older than fifty years old. This study was also done almost ten years ago in 2007. This study took place in India, which has a very different culture than the United States, meaning participants likely have different views and experiences than those that participated in the study (Dash and Saji, 2007).

In research conducted by Bente, they found that adding avatars for customers to communicate with would increase perceived security by shoppers. However they found that adding actual video makes the most difference. This may be one of the reasons that adding a social presence component to websites did not show any difference in risk perceptions (Bente *et al.*, 2008).

In another related research done by Shin and Shin, it was found that social presence does mitigate security concerns. For their study, they actually constructed a real virtual mall. By having participants go through and

actually complete an online shopping transaction they were able to create a different user experience than a scenario reading, which is the research design of this study (Shin and Shin, 2011).

Another research study done by Zhang, Lu, Shi, Tang, and Zhao, did involve college students and found that social presence can affect consumers' moods and therefore affect intention to purchase. Social presence does seem to have a mitigating effect in some aspects of online shopping as found by this research. It helped with perceived benefit and purchase intention. Social presence was found to positively reinforce the relationship of both mood and purchase intention and mood and perceived benefit. However this study did not examine whether social presence plays a role in intention to purchase in regards to security risk. It does seem that social presence can affect online shopping intention but not in regards to security risk (Zhang *et al*, 2012).

A more recent study done in Croatia involving Croatian undergraduate students did an in-depth analysis of online shopping habits of individuals (Knezevic, Jakovic, and Strugar, 2014). One thing that was found was that one of the benefits of online shopping is that there is no physical interaction. In fact, people found it very important that there is no pushy salesperson online persuading one to make a purchase they really do not want to make.

Another study examined how privacy concerns affects customers purchase intention. This area of research is inclusive as previous research used in the literature review claimed that privacy does affect intention. However, a more recent study found the opposite. Two companies were used, one that asked for extensive personal information, therefore increasing perceptions security risk, and the other company required far less personal information, decreasing security risk. However, there was no difference in intention to purchase from these two companies. Even when consumers where asked to provide all of their personal information which should increase security risk, consumers still completed their transactions at the same rate as a less intrusive company (Preibusch, Kübler, and Beresford, 2013). Therefore security risk may not be as big of a concern for consumers as it used to be which may be why security risk was not influenced by factors like type of store or a social presence tool.

In conclusion, each study was done a little differently than the current one and this could be why the results are different.

When the internet first became available for public use, online shopping was not one of the main things people were using it for. But as time

went on, more and more people began to use the internet as part of their normal everyday life, and the e-commerce industry began to grow. With the growth of the e-commerce industry, a new type of store became popular. The pure play store, a store that was only found online. These stores at first might have been a cause for concern for some online shoppers as they were new and unfamiliar. Part of this concern had to do with security risk. People were not used to have to provide personal information on a website and might not feel comfortable with giving out their personal information through internet. But as time goes on, people seem to be getting used to the internet. Online shopping has become just as common as shopping in a mall. It seems that now the type of store has all been blended into people's daily experience. Whether the store is online only or has both a physical store and an online store does not seem to matter to online shoppers anymore. As time goes on, people are becoming more comfortable with online shopping in general, therefore the type of the website that they are shopping with becomes less important.

#### **THEORETICAL IMPLICATION AND SUGGESTED FUTURE STUDIES**

The theoretical implication of this study is to propose a research model for consumers perceived online shopping security risk and intent to purchase, and using imperial survey data to test and modify the research model. The finding of this study showed that type of store, either pure play or click and mortar, does not influence consumers' perceived online shopping security risk and does not influence intention to purchase. The idea of whether shopping on a click and mortar website or a pure play website influences risk perceptions is not one that has been tested before. The results from this study indicated that the type of store and social presence do not influence consumers' perceived online shopping security risk or influence intention to purchase. Regardless of the type of online store that someone is shopping on, the consumers' security risk perceptions seems to be the same. More studies could explore whether the type of store would impact some aspects of online shopping. While it may not influence consumers' security risk perceptions, it may influence other variables.

This study also examined the impact of social presence on online shopping perceptions. When social presence was included on an online shopping website through an online chat system, it was not found to impact security perceptions. However, social presence has been found to influence aspects of online shopping. This is a variable that could be explored more to

see what the true impact of adding social presence to an online shopping website is.

Consumers' perceived security risk has been found to influence online shopping by this study. When there is a high perception of security risk, the intention to purchase will be lower. However, the perception of security has not been well defined. More studies need to be done about how security risk is formed and how it can be mitigated. Studies should be done to examine how to decrease security risk as this is a barrier in the e-commerce industry. It is especially important in regards to intention to make a purchase. This relationship has been confirmed and therefore it is even more important to examine why certain security risk perceptions exist.

One important contribution of this study is that, the results of the study showed that consumers' online shopping experience influence the way that they perceive security risk. The longer someone has been shopping online, the less their perceptions of security will be. This means that as more and more people online shop, security risk will decrease overall. The relationship of online shopping experience and security risk could extend to other forms of risk as well and is something that should be explored.

## **PRACTICAL IMPLICATION**

This study provides managers with important information about security risk in online shopping. A lot of retailers have started to add an online chat feature to add a way for customers to communicate with the store. Adding an online chat system can create a sense of social presence for the website. It can also add a sense of friendliness. This can help the reputation of the website and the store and helps take the place of a physical interaction that an online shopper may have in a physical store. But this does not affect consumers' perceived security risk. Therefore, if managers are concerned with how customers are feeling about security of their e-commerce website, adding an online chat system may not be solution for the issue. Adding a chat system can change the reputation of the website and make the online shopper feel more comfortable but it does not correlated with consumers' perceptions of the security risk.

Many types of pure play stores are available to the public and online shopping seems to be the way most people shop these days. People are now feeling more comfortable making online purchases, even if they are not familiar with the store. Because of this, more and more pure play stores will continue to be created. Even if people are less familiar with the store because

they do not have a personal interaction with the store, there is still a level of comfort with the online store. This is probably due the fact that people are getting used to online shopping as it has been around for a while now. As online shopping becomes more and more common, people will be more comfortable with all types of online websites. This will allow more pure play stores to be created and shows that online shopping will continue into the future.

### **LIMITATIONS**

One of the main limitations was that this study used a convenient sample. The group was very selective and similar. It was not a random sample. Because this study took place on a college campus, it was more convenient to use students as the target sample. People from a rather small campus felt uncomfortable saying no to participate the survey, which led to a response rate of 90%. By not doing a random sample, the participants of the survey may have less representation to the real population of online shoppers. Also, with a high response rate, there could be potential for sampling bias.

For further study, a wider age group may be beneficial. College students have grown up with the internet and therefore have different perceptions than those who were introduced to the internet later in life. Other studies have found that online shopping is preferred in youth under the age of 30 (Bhatt and Bhatt, 2012). Another issue was that the way the online shopping experience was recreated was through a four page description complete with photos. Because of bias with certain websites, including past experiences with that website or information previously seen about that website, using an actual online store front did not seem practical. However, a store front could have been created to help the participant have a physical and live experience with the website. This would be rather time consuming to have to create a live website that accurately mimics a typical online shopping experience. If the research involved an actual physical experience, different results may have been provided as mentioned earlier by comparing results to other studies.

### **Conclusions**

This research proposed a research model for consumer perceptions of security risk when shopping online and how that relates to intention to purchase. The model proposed that security risk was influenced by the type of store, either

pure play or click and mortar. The use of a social presence tool was proposed to mitigate security risk. The study used survey data to gather data. After data analysis was completed, the research model was modified by proposing that online shopping experience is the main determinant in how a consumer will perceive security risk and therefore will influence their intention to purchase.

One objective of this study to investigate whether there is a relationship between the type of online store and the consumers' perception of security risk. It was hypothesized that when a consumer shopped on a pure play website they would have a higher perception of security risk than when they shopped on a click and mortar store. When a store has a higher perceived security risk, the consumer is less likely to have intention to make a purchase. Another purpose of the study was to examine whether the use of social presence on an online shopping website has a mitigating effect on the perception of security risk and therefore have a positive effect on the intention to make a purchase from the website.

The research used a survey questionnaire to collect data. The survey was administered on a college campus, relying on a convenience sample. The response rate was 90%.

After collecting the result of the 200 survey participants, the data was analyzed. The data was analyzed through ANOVA and MANOVA and ANCOVA. Not only were the hypotheses tested, but descriptive analysis was completed along with an inferential analysis.

It was found that types of stores do not affect risk perception or purchase intention which could lead to the success of more online only shopping websites, the likes of Amazon.com or ebay.com. Social presence was also found to not have an impact on either perceptions of security risk or intention to purchase.

Experience is the main factor that was found to influence online shopper's security and risk concerns. It was found that intention for making an online shopping purchase has a direct relationship with security risk. If there is a lower perception of risk, there is more intention to make a purchase. Because of this finding, it may mean that online shopping will become more widely accepted in the years to come. As more and more people turn to the internet to buy an item that they may need, more people will have more experience. This should decrease perceptions of online shopping security risk in the future.



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## Appendix A

### SURVEY QUESTIONS

Construct		Measurement item	Adapted from
Risk	R1	I don't perceive any risk by sharing my personal information concerning my transaction with the online store.	Dash and Saji (2007)
	R2	I am confident that others cannot tamper with information concerning my transaction with the online store.	
	R3	I believe that advanced technology can certainly provide the desired security for my transaction with the online store.	
	R4	I don't think my money will get stolen whenever I transact with an online store.	
Information Security	IS1	I feel secure in providing sensitive information when transacting with electronics websites.	Pavlou et al. (2002)
	IS2	I would feel totally safe providing information about myself to electronics websites.	
	IS3	I would feel secure sending sensitive information to electronics websites.	
	IS4	The security issue of sensitive information was a major obstacle to my online purchases from electronics websites.	

	IS5	Overall, websites that sell electronics are a safe place to send sensitive information	
Social Presence	SP1	There is a sense of human contact in the website I visited.	Yeh et al. (2011)
	SP2	There is a sense of personal-ness in the website I visited.	
	SP3	There is a sense of human warmth in the website I visited.	
	SP4	There is a sense of human sensitivity in the website I visited.	
	SP5	There is always a possibility of social networking through the interaction with the online store.	Dash and Saji (2007)
	SP6	There was a sense of friendliness when I interacted with the online store.	
	SP7	There was a sense of belongingness when I interacted through the online store.	
Intention to Purchase	I1	I am likely to purchase the products on this site.	Zhang et al. (2012)
	I2	I am likely to recommend this site to my friends.	
	I3	I am likely to make another purchase from this site if I need the products I will buy.	
Trust	T1	The overall feeling of this website is trustworthy.	Dash and Saji (2007)
	T2	I trust this online shopping website because they keep my best interests in mind.	Shin and Shin (2011)
	T3	This online shopping website is one that keeps promises and commitments.	Dash and Saji (2007)
	T4	I do not think that things may go wrong with my transaction through my online store.	
	T5	I am confident that my transaction through my online store will always be transparent.	