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Enschede, June 2021

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MASTER THESIS

DO YOU DARE TO TAKE A RISK? THE EFFECT OF TRUST CUES IN WEBSITE DESIGN ON PRIVACY RISK PERCEPTION

Abstract

Objective - The Internet is a big part of our daily life. We use it to communicate, shop and gather information. As the Internet continues to grow, concerns about online privacy arise as well. This study tests the effect of trust cues in website design on the privacy risk perception. The aim of this study is to contribute to the practical relevance of the effect of trust cues in website design and the reduction of the perceived risk of loss of private information.

Method - The effects of two website design factors, background color (cool vs. warm) and eye gazing (direct vs. averted), are tested in two website contexts (government and hotel booking) with a between subject experimental design (N=494). Data was gathered using quota random sampling to ensure equal distribution of men and women through each condition. 60.8% of the respondents has a Dutch nationality.

Results - The results of the MANOVA and analysis of variance for trust and risk perception show that website context and background color are important determinants for trust and privacy risk perception. It was found that trust is highest towards a government website. Gender was taken into account as a moderator to test whether men and women respond different to trust cues. No effects have been found for gender, indicating that men and women respond the same to trust cues in this study. Participants feel most comfortable when presented a website with a blue background color as opposed to an orange background color. The results indicate that gaze had no effect on the perception of trust or risk.

Discussion - For practical implications attention should be paid to the background color that is used on a website. Additionally, the background color and the website context should be congruent. Website context and background color are both important determinants for the privacy risk perception and therefore they should be in line with each other.

Keywords: Website design, trust cues, background color, eye-gaze, privacy risk perception, trust

1. Introduction

In October 2020, there were 4.66 billion active internet users which represents 59% of the world population (Clement, 2020). In 2020, the worldwide e-commerce retail sales where over 4.206 billion U.S. dollar (Sabanoglu, 2020). As these numbers state, the Internet is a major part of our lives. The Internet is part of our daily communication, we enjoy online services, and it is our main source of information (Choi, et al., 2018). As the Internet use continues to grow, the concerns about privacy issues arise as well. Several studies indicate that the concerns about online privacy are strongly increasing (Nowak & Phelps, 1992; Phelps, et al., 2000). Phelps, et al. (2000) found that privacy concerns went up from 30% in 1970 to 80% in 2000. Concerns arise about how user information is stored, accessed, bought, sold, shared, or misused without the users' knowledge or consent (Buchanan, et al., 2006). Whether we go on the Internet to communicate, shop or search for information, we leave behind a digital footprint which reveals information about our activities, lives, and interests (Buchanan, et al., 2006). There is concern about who (mis)uses our personal information: governments, public agencies, private agencies, corporates, and so on. Questions like 'what will happen to my personal information?", "who has access to my personal data?" and "how is my personal data stored?" are some questions that arise together with the topic 'online privacy'. Dutton and Helsper (2007) found in their study that 70% of the internet users in the U.K. think that people put their personal information and privacy at risk by going on the Internet. They also found that 84% of the users have the feeling that their private information is being stored without their knowledge.

Users' information is at risk when they visit a website and additionally when they complete a transaction on a website (Milne, et al., 2004). When an Internet user provides personal information or financial information such as credit card information, this information can be compromised or intercepted. The next threat occurs when the company has obtained the personal and financial information. In the past, many companies have not kept the promise about not sharing data with other parties (Milne, et al., 2004). Even since the introduction of the General Data Protection Regulations (GDPR), users still experience privacy concerns (Paul, et al. 2020). The moment consumers are connected to the Internet, their personal information becomes increasingly vulnerable.

Many studies have been conducted about trust cues in website design. For instance, colors, photographs, design and interface elements and many other trust cues have been used to enhance consumers trust towards websites. For example, the study of Huh and Shin (2013) found that trust cues in website design, such as color scheme, font style, professional look, and overall aesthetics, can influence consumers behavioral intention and consumers attitude towards a website. Schoenbachler and Gordon (2002) also found that trust in an online environment is enhanced by trust cues in website design. Subtle trust cues in the design, such as trustworthy colors and social presence elements, can enhance the trust perception of the user (Nass, et al., 1997).

Previous research has shown that color is a useful trust cue for enhancing trust towards websites (Alberst & Van Der Geest, 2011; Belizzi & Hite, 1992; Cyr, et al., 2010; Kliger & Gilad, 2012). More specifically, it has been found that a blue color for example, works calming and relaxing. For that reason, background color is chosen to be a trust cue in the present study. The second trust cue, eye gazing, has shown to be a successful trust cue when it comes to enhancing trust (Kaisler & Leder, 2016; Willes, et al., 2011; Willes & Todorov, 2006). Those studies have found that when someone is looking at you and is addressing you directly in a social setting, trust increases. Additionally, including a facial photo on a website increases the feelings of social presence. It is known that social presence is an important element to increase trust towards websites (Ogonowski, et al., 2014). Previous research has shown that eye gaze can be a successful trust cue and for that reason eye gaze in facial photos on websites is an interesting trust cue to explore. Even more interesting is the combined effect of the trust cues of background color and eye gaze and the interaction between those trust cues. It is expected that congruent design elements, such as a trustworthy color and someone directly addressing you, enhances the trustworthiness of the website. Shisharan (2010) for example states that congruent combinations generate greater trust in websites than when design elements are incongruent.

Since both trust cues have been successful in enhancing trust, trust can be used to be an important underlying mechanism that explains the effectiveness of trust cues such as background color and eye gazing on privacy risk perception. It is expected that when trust in a website is high, the privacy risk perception reduces. Mayer et al. (1995) found that trust is an important factor to determine to what extent users are willing to take a risk involving their personal information and Kim et al. (2008) found

that the presence of trust makes users less concerned about the possible risk they are taking regarding their privacy. Moroson and DeFranco (2015) found in their research that users who have trust have a lower privacy risk perception.

Men and women react different towards trust cues. Previous research has shown that men and women perceive colors differently (Singh, 2006) and men and women prefer other colors (Roe, 2011). Additionally, it has been found that eye gazing has a stronger effect on women as opposed to men (Alwall, et al., 2010; Bayliss, et al., 2005). However, it has been found that women, in general, are less trusting than men (Buchan, et al., 2008; Garbarino & Slonim, 2009; Irwin, et al., 2015). It has been found by Grbarino and Slonim (2009) that women are more sensitive to the context whether they would trust something or someone or not. They have found that men are less sensitive to the context when it comes to trusting. However, it has also been found by several studies that women have more concern when it comes to privacy issues (Furash, 1997; Kate, 1998).

The effect of trust cues on websites will be tested in two different contexts: a government website will be designed and a hotel booking website. For both websites the privacy risk perception of the user is important since personal data of the user is involved. Users will use trust cues to evaluate the website and they will look for information to evaluate the website because they are concerned about their privacy. However, both websites can be categorized differently. The government website is a non-commercial website, and the hotel booking website is a commercial website. It will be tested whether privacy risk perception is different for users visiting a commercial or non-commercial website. Do they trust one website more easily that the other? Do users feel their privacy is more at risk at one website than on the other? Potentially users' privacy risk perception is influenced by the context of a commercial or non-commercial website and feel that their privacy is more at risk at one website than the other. For instance, a study of Beldad et al. (2011) found that users are less worried about their data being sold to other companies when visiting a non-commercial municipality website as opposed to a commercial online exchange.

To the authors best of knowledge, little research has been conducted about the effect of trust cues in website design on privacy risk perception. To test the effects of the trust cues, the following research question is formulated:

What is the effect of background color (cool vs. warm) and eye gazing in facial photo's (direct vs. averted) in different website contexts (commercial vs. non-commercial) on the privacy risk perception, mediated by trust and moderated by gender?

To answer the research question, literature was reviewed, and hypotheses were formulated. The method section discusses how the proposed research model was tested, what materials were used, what the procedure was and what measurements were used. An experiment was conducted to test the effect of trust cues (background color and eye gazing in photographs on a hotel booking website and a government website) on users' privacy risk perception.

2. Theoretical framework

In this section, relevant literature is discussed. First the dependent variable privacy risk perception will be presented. The independent variables will be discussed as well as the interaction between those variables. Additionally, the mediating and moderating variables will be discussed. At the end of the theoretical framework, in figure 1, the research model is visualized.

2.1 Privacy risk perception

There are many ways to define online privacy, but one important aspect is that online privacy has the same base as 'regular' privacy: "the right to be left alone" (Warren & Brandeis, 1890). Another important aspect to privacy is that the individual is in control of the information about the self and that the individual can determine to what extent, when and how the information is disclosed to another person (Bauman, 2016). The author states that the process of online trust building is based on the perceived trustworthiness which is a set of qualities that provide the base.

The lack of Internet users' trust in online information privacy has been identified as a problem that limits the growth of e-commerce (Malhotra, et al., 2004). Once someone uses the Internet, there is a risk of personal information being disclosed without permission. Milne and Culnan (2004) state that the Internet as distribution channel brings issues regarding the disclosure of personal information. They found that if an online environment is perceived as risky, the user will likely leave the website. Users face the risk, when they are online, of their personal information being disclosed without being aware of it or without permission (Culnan & Bies, 2003). Once personal information is disclosed, it can be given to third parties with whom the user has no relationship. Because users face the risk of their information being disclosed, it takes a certain level of trust to disclose personal information to an organization in the first place (Milne & Culnan, 2004). It was found that even users who are very careful about disclosing personal information, will disclose information under the right conditions (Wakefield, 2013).

Information privacy can be defined as: "the claim of individuals, groups or institutions to determine for themselves when, how and to what extend information about themselves is communicated

to others" (Westin, 1967, p.10). Concerns about information privacy are an individuals' subjective perception within the context of information privacy (Malhotra, et al., 2004). The same study state that Internet users see the release of personal information as a risky process because by sharing their personal information they become vulnerable to the company. Collection of personal information is perceived to be fair when users have control over their personal information and the user needs to be informed about the website's intentions of the use of information (Malhotra, et al., 2004). A premise of users to reveal personal data is the condition that users need to be given a choice for granting access to their personal data and that users have control over their personal information (Milne, et al., 2004).

Privacy risk perception is the extent to which an individuals' belief that their personal information is disclosed to a firm or the likelihood that their personal information is lost (Jin, 2008), stolen, sold, or shared with third parties (Smith, et al., 2011). Perceived privacy risk is the users' subjective belief about the probability of a negative outcome in pursuit of a desired outcome (Pavlou & Gefen, 2004) and it is users' subjective belief whether it is safe to share personal data or not (Bol, et al., 2018). Additionally, privacy risk perception refers to users' worries about the loss of personal information as a result of disclosing information (Mutimukwe, et al., 2020). The perception of privacy risk is linked to uncertainty which is caused by the website or company (Jin, 2008). It was also stated by Jin (2008) that privacy risk perception has a direct negative effect on privacy behavior. A users' calculation of risk is the assessment of the likelihood of negative, undesirable consequences and outcomes as well as the severity of the negative outcomes and consequences (Smith, et al., 2011). An users' estimation of the privacy risk perception is an important determinant for users who are considering making an online transaction (Kim, et al., 2008). A users' perceived risk has been found to be an important determinant to engage or not. When a user feels there is a risk, the user becomes reluctant in continuing making their online transaction (Kim, et al. 2008).

Trust cues in website design can be an important factor when it comes to influencing the privacy risk perception. There are many cues that can enhance the trustworthiness of websites, such as privacy statements. The present study focuses and the use of background color and eye gazing photos in two website contexts to enhance the privacy risk perception.

2.2 Background color

The effect of colors has been researched extensively in many contexts. Color brings intrinsic meaning and communicates the desired image, color affects perception and people tend to pair colors with emotions (Labrecque & Milne, 2010). It was found that in a marketing context most of the opinions about products are formulated based on color (Singh, 2006).

The study of Alberts and Van Der Geest (2011) found supporting evidence that the trustworthiness of a website can be increased by the use of color. They tested eight medical websites, eight legal website and eight finance websites. They tested four colors on these websites: red, blue, green, and black. When the same website was presented but other colors were used, the trustworthiness was perceived differently; blue was perceived as most trustworthy and black as least trustworthy in all websites Alberts and Van Der Geest (2011) tested. Cyr et al. (2010) tested the effect of color on three e-commerce websites, and they found in their study empirical evidence that color is one of the main, significant determinants for trust. Kliger and Gilad (2012), who tested the effect of colors on financial decision making, also state that the decision-making process is influenced by several factors and color is one of the most influential factors on consumer feelings. Kim and Moon (1998) found evidence that colors influence the feelings of trustworthiness in a cyber-banking environment. They found that cool colors are preferred over warm colors in the context of cyber-banking. The authors also found that interfaces with a bright color background will even induce the feelings of untrustworthiness.

Color has different dimensions, such as hues, saturation, and value. Wavelengths can be used to categorize color into two groups. Colors with long wavelengths are warm colors and colors with short wavelengths are cool colors. Examples of warm colors are yellow, orange and red. Warm colors trigger feelings of arousal and excitement (Labrecque & Milne, 2010). Green, blue and violet are examples of cool colors. Cool colors have a calming effect on people, and they are perceived as more relaxing. People tend to be physically drawn towards warm colors, but they can be found unpleasant. (Labrecque & Milne, 2010). It was found that users in a blue environment feel more relaxed and the calming influence of the color blue makes them more comfortable and satisfied in a shopping-related context (Belizzi & Hite, 1992). In many different contexts where the privacy risk perception is of importance, and it is important that the online environment looks trustworthy and has the ability to calm users.

Singh (2006) found that there are strong associations between colors. He found that orange, yellow and blue are happy colors and brown, red and black are sad colors. He found that the effects of such emotion eliciting through colors can affect users' emotional responses and behavioral intentions. Other associations someone has with a certain type of color may interfere with the intentions for the purpose of that color and an individuals' attitude towards a certain color may affect the individuals' choice of any product which has that color (Funk & Ndubisi, 2006).

As stated before, color can influence perception of users. It was found that when someone is in a red environment, they feel there is actual danger and that there is something at stake (Klinger & Gildad, 2012). They also found that when users are in a green environment, they feel much safer, and they are not afraid of being in danger. It is expected that the use of a cool color has the greatest ability to increase trust towards the website. This is expected because in several studies it has been found that cool colors are perceived as most trustworthy (Alberst & Van Der Geest, 2011; Belizzi & Hitte, 1992; Cyr, et al., 2010; Kliger & Gilad, 20120). Therefore, the following hypotheses can be stated about background color:

Hypothesis 1: The use of a cool background color (as opposed to a warm background color) in website design will increase trust towards the website, resulting in a lower privacy risk perception.

2.3 Eye gazing

Photographs on websites can have a major influence on the perception of consumers on many aspects. It was found by Karimov, et al. (2011) that including human-like features on e-commerce websites, such as facial photographs, will increase consumers' initial trust towards websites they are unfamiliar with. Another study found that including portrait photographs on an online-bank website has a positive effect on the perceived trustworthiness of the website (Steinbrück, et al. 2002). A study by Riegelsberger, et al. (2003) investigated whether photos of people increase trustworthiness of existing e-commerce websites. They found that the trustworthiness of low-trust website increased significantly when a photo of a human was shown. However, it was found in their study that the photo must fit in the design of the website to increase trustworthiness, not any general stock photo can be used.

Eye gazing is another aspect that has been researched extensively. Eye gazing is an important, nonverbal, and social cue in communication. Kaisler and Leder (2016) tested different gazing directions in social settings and the effect of gazing on trustworthiness. They found that direct gazing was perceived as most trustworthy as opposed to averted gazing because people feel addressed more directly. Willis, et al. (2011) conducted a research with a combination of eye gazing and facial expression: they tested direct and averted eye gazing combined with six emotions on the perceived trustworthiness. It was found in their study that happy emotions were judged more intense when direct eye gazing was used. Willis and Todorov (2006) state that trust is built on a face and especially smiling faces enhance trust. The study demonstrated that emotional faces and eye gazing has a strong effect on the judgement of trustworthiness and play a big part in the process of making social judgements. The study of Abbott et al. (2018) found in a real life setting that direct gazing is perceived as more trustworthy as opposed to averted gazing. Bayliss and Tipper (2006) also found that individuals who make direct eye contact are perceived as more trustworthy as opposed to individuals who do not make eye contact.

Including a facial photograph can be seen as a form of social presence. Short et al. (1976) describes social presence as the feeling of others' presence in the medium and interactions. When it comes to e-commerce, social presence is relevant because of the restrictions of direct human to human contact in an online environment (Ogonowski, et al. 2014). The authors state there are several ways to include social presence in an online environment to make users feel there is actually a person present on the other side to help out. Ogonowski et al. (2014) state that one of the biggest reasons that online stores fail is because of consumers' low trust and a solution for this problem is increasing the levels of social presence on a website. They found evidence that social presence has a positive effect on trust on e-commerce websites. They found that any form of social presence on an e-commerce website will increase trust towards a website. Therefore, the following hypotheses can be proposed:

Hypothesis 2: Direct eye gazing (as opposed to averted eye gazing) in a photograph on the website will positively increase trust towards the website, resulting in lower privacy risk perception.

2.3.1 Congruency between background color and eye gazing

Both color and eye gazing in photos can influence the users' emotions and the perceived trustworthiness of a website. Cyr (2013) states that the visual design of a website, including the use of both color and human-like photographs, can be used to reduce uncertainty and to obtain additional information about the website. In another study it was found that websites with human faces that was congruent with the website design increases trust (Cyr, et al., 2009). Riegelsberger, et al. (2003) state the importance of congruency about photos used on a website, it should fit the total design. The study of Sasidharan (2010) reported about the importance of color and design congruency. He states that is important that the design elements on a website are congruent among each other and that the design elements are congruent with the context of the website. Saisharan (2010) states that congruent combinations generate greater trust in websites than when the elements are incongruent. For this study it is important that the design elements fit the website design, the context of the website and the motivation of the user. This results in a positive affect towards the privacy risk perception.

It is expected that the use of a cool background color together with direct gazing will have the greatest ability to increase trust towards the website. Especially when cool background colors are combined with direct eye gazing in facial photo's on website it is expected that this combination will have the greatest effect because in several studies it has been found that cool background colors are perceived as most trustworthy (Alberts & Van Der Geest, 2011; Belizzi & Hite, 1992; Cyr, et al., 2010; Kliger & Gilad, 2012;) and because several studies have found that direct gazing increases trust towards a website (Kaisler & Leder, 2016; Willis, et al., 2006). The following hypotheses can be stated about the interaction between background color and eye gazing:

Hypothesis 3A: Congruent combinations of background color and eye gaze will increase trust, resulting in lower privacy risk perception (as opposed to incongruent combinations).

Hypothesis 3B: Especially the combination of a cool background color and a direct eye gazing photo will increase trust towards the website, resulting in lower privacy risk perception.

2.4 Mediating role of trust

Trust can be described as a mental state in which an individual is vulnerable and accepts this vulnerability because they have positive expectations about the intentions from another (Haselhuhn, 2015). It was found by Cook, et al. (2009) that online trust has the same elements as traditional trust. This means that trust is developed between two parties, trust appears in a complex and uncertain environment, that a trustor shows vulnerability, and that the trustor takes a risk (Cook, et al. 2009). However, Bauman (2016) discovered that the context of the online environment in which trust is build is different from the traditional environment. One of the differences is how trust is built. In a physical environment trust is built through face-to-face contact and senses are stimulated in different ways. In an online environment the experience is much more anonymous, and trust is developed much faster (Bauman, 2016). He also states that in a physical store, trust can be built step-by-step and this process takes time. In an online environment however, trust is developed within the first seconds based on what the user sees. Malhotra, et al. (2004) examined the relation between peoples' concerns about their privacy and their behavioral intention and found that trust is the cornerstone in this relationship.

Trust can be seen as an important determinant to what extent a user is willing to take a risk regarding their personal information (Mayer, et al., 1995). The presence of trust makes users less concerning about the possible risks they are taking, making the user lower their perceptions of risk (Kim, et al., 2008). Morosan and DeFranco (2015) researched the willingness to disclose personal information in a mobile app for a hotel. They found that users who have trust in the app have a lower privacy risk perception and, therefore, are more willingly to share personal information.

It is expected that when a user has trust in a website, their privacy risk perception will be lower. Therefore, the following hypothesis is stated about the mediating effect of trust:

Hypothesis 4: Higher trust towards a website will result in lower privacy risk perception.

2.5 Type of website

Context in which a user has to reveal personal data is of importance. Some websites are perceived as more trustworthy which makes users more willingly to reveal personal information (Phelps, et al., 2000). It is also stated in the same study that the type of information that is asked of the user is of importance. Phelps et al. (2000) found that users are willing to reveal information about their demographics, hobbies, marital status, age, occupation, or education. However, most users will never provide information about their annual household income, their social security number, home address, the kind of credit cards they possess and their last purchase with a credit card.

Two types of potential risks in e-commerce are the loss of money and the loss of information privacy which leads to misuse or abuse of personal data (Beldad, et al., 2011). Losing information privacy can be seen as a crucial risk in electronic government transactions, which could possibly lead to the misuse or abuse of personal data (Beldad, 2011). It was found that users of a non-commercial municipality website indicated to be less worries about selling their data with other companies and they have more trust towards the organization. They indicated that users are more worried about the disclosure of personal data after commercial online exchanges.

Bon et al. (2018) conducted a study about the privacy calculus in relation to disclosure of personal information across three contexts: health, news and commercial. They found that privacy risk perception does not differ significantly among the different contexts. However, they found that privacy risk perception is present in all contexts. These results are supported by Mutimukwe et al. (2020). They conducted a study about information privacy, privacy concerns and privacy risk perception in e-service. Three different contexts were explored: e-commerce, e-government and social media. The authors found that privacy risk perception is present in all three contexts. However, privacy risk perception differs per context which means privacy risk perception is dependent on the situation. They indicated that privacy risk perception is higher in an e-commerce and social media environment and is lower in an e-government environment. They indicated that privacy risk perception is present in an e-government organization since it often involves more sensitive personal data than in an e-commerce or social media environment (Mutimukwe, et al., 2020).

In the present study, it will be tested whether privacy risk perception is different in a commercial (i.e., a hotel booking website) or non-commercial website (i.e., a government website). Therefore, the following hypotheses can be formulated:

Hypothesis 5A: The level of trust regarding personal information on a non-commercial website is higher, resulting in lower privacy risk perception.

Hypothesis 5B: The level of trust regarding personal information on a commercial website is lower, resulting in higher privacy risk perception.

2.5.1 Interaction between eye gazing and website context

Willis and Todorov (2006) conducted a study about the trustworthiness of eye gazing where participants had limited exposure time to judge a portrait photograph. Kaisler and Leder (2016) also tested the trustworthiness of eye gazing in a social setting and Karimov et al. (2011) tested the effects of facial photographs on e-commerce websites and their effect on trustworthiness. Steinbrück et al. (2002) included portrait photographs on their online banking website to enhance trust and Riegelsberger et al. (2003) tested the effect of portrait photographs on an e-commerce website. All studies found a significant effect for the relation between eye gazing and trust. These studies have been conducted mostly in commercial settings and therefore it is expected that eye gazing will have more effect in a commercial website as opposed to a non-commercial website. The following hypothesis can be stated about the interaction between gazing and website context:

Hypothesis 6A: Eye gazing on a commercial website will increase the level of trust, resulting in lower privacy risk perception.

Hypothesis 6B: Eye gazing on a non-commercial website will not increase the level of trust, resulting in higher privacy risk perception.

2.5.2 Interaction between background color and website context

Alberst and Van Der Geest (2011) tested the effects of color on trustworthiness on eight medical websites, eight legal website and eight financial websites. Klinger and Gilad (2012) tested the effect of color on financial decision making. They found significant relations between the use of cool colors on trustworthiness. Additionally, Kim and Moon (1998) found evidence that colors influence the feelings of trustworthiness in a cyber-banking environment. These studies have been conducted in many different non-commercial contexts and all found the same results. Therefore, the following hypothesis can be stated about the interaction of background color and website context:

Hypothesis 7A: Cool background colors will increase the level of trust for a non-commercial website, resulting in lower privacy risk perception.

Hypothesis 7B: Cool background colors will not increase the level of trust for a commercial website, resulting in higher privacy risk perception.

2.6 Moderating role of gender

Previous research indicated that women are less trusting compared to men and women are more inclined to react to fear incentives when it comes to social judgements (Irwin, et al., 2015). The study of Buchan, et al. (2008) also indicates that women are less likely to trust other people and they show that females have greater trust concerns than men. The study of Garbarino and Slonim (2009) indicates that women are generally less trusting than men. The same study found that women are more sensitive to context and tend to trust less than men. It was found by Bajtelsmit, et al. (1999) that social preferences might play a role in the differences; if women are less trusting, they might be willing to take less risk to, for instance, make a purchase. Furash (1997) and Kate (1998) both found evidence that women have more concern when it comes to privacy issues. They found that women are mostly concerned with privacy threats, and they are concerned about online privacy regarding the disclosure of insurance, financial information, and medical information. Paul (2001) found that men give personal information such as home address, e-mail address and phone numbers more easily than women. He found that women found this personal information that should be protected.

The moderating variable will be used to test whether eye gazing affects the privacy risk perception different for men and women. The study of Coutrot, et al. (2016) shows that men are less likely to trust to a same-sex eye gazer than a different-sex eye gazer. Another study shows that gazing has a stronger effect on women than it has on men (Bayliss, et al., 2005). Alwall, et al. (2010) confirm this finding as they also found supporting evidence that gaze-cuing has a larger effect on women than on men. Therefore, the following hypothesis is proposed:

Hypothesis 8: The effect of eye gazing on trust will be stronger for women as opposed to men, resulting in lower privacy risk perception.

It is also known from previous research that men and women perceived color different and that they prefer different colors. Jain, et al. (2010), for example, indicate that women prefer brighter and gratifying colors and men prefer soft, stifled colors regardless of any context. In the same study it was also found that men and women experience colors different. They found that women can see more shades of color than men. Sliburyte and Skeryte (2014) found evidence for the color preferences in a marketing context. They found that men like red more often than women and women prefer blue, green and white more often.

Bonnardel, et al. (2017) found that both men and women have a preference for cool colors over warm colors and women shown an additional preference for pink colors. In this study of Bonnardel, et al. (2017) sixteen colors were shown, and the participants were asked to rate the importance of color in nine different contexts, among which interior painting and exterior painting. Singh (2006) also proposes that people men and women perceive color differently in a marketing context. He found that men like neutral colors such as white, black, and grey more often than women. He also found that women prefer combinations of blue and red more frequently than men. Bonnardel, et al. (2017) found that both men and women prefer blue-green colors and women have an additional preference for pink-purple colors. In another different study it was found that men prefer darker colors to a greater extent than women (Roe, 2011). Roe also found that red and blue are the most liked colors by men and blue is preferred by a greater extent by men as opposed to women. Roe collected this information of account information of over 1 million Twitter users. The following hypothesis about the effect of background color is proposed:

Hypothesis 9: The effect of a cool background color on trust, will be stronger for women than for men, resulting in a lower privacy risk perception.

2.8 Research model

Figure 1 shows the proposed research model and the relationships between the variables. It is expected that gender has a moderating effect and trust will mediate the effect of trust cues on the privacy risk perception.

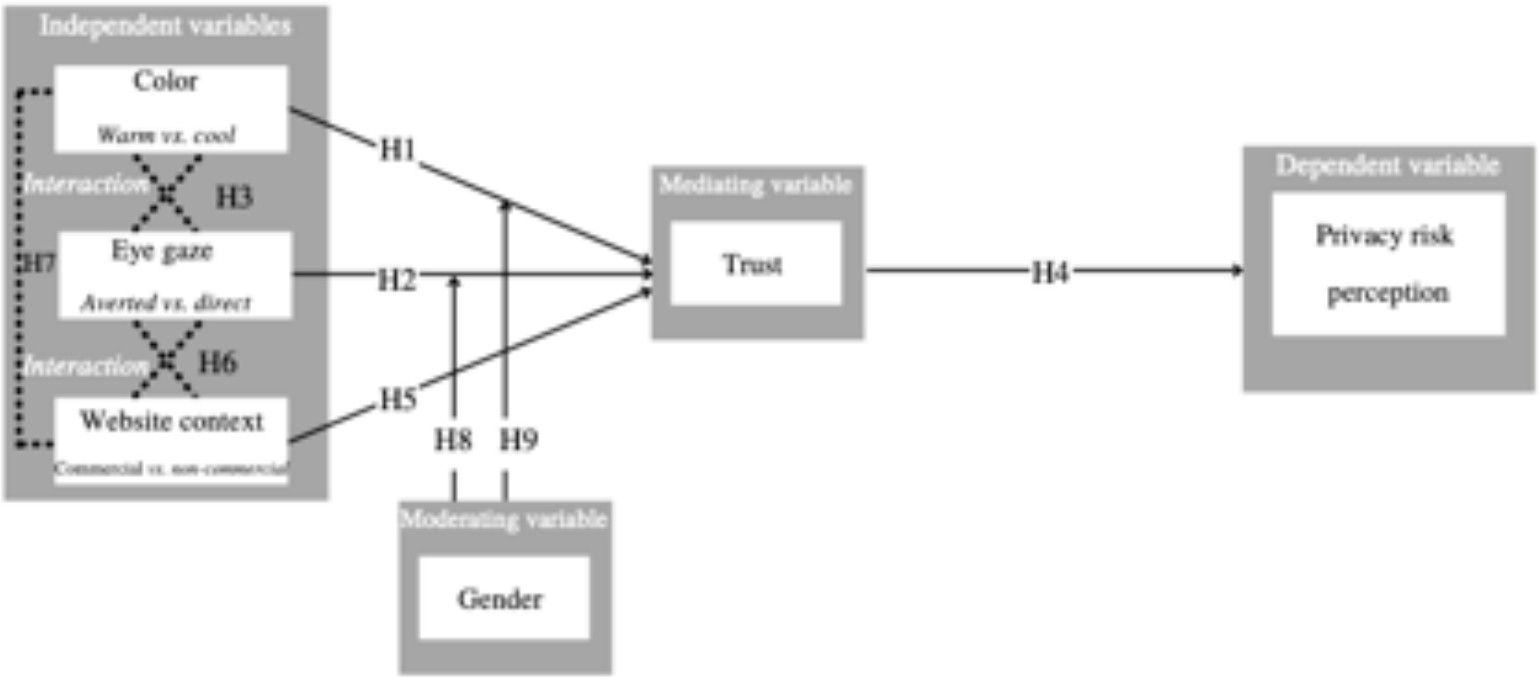

Figure 1 *research model*

3. Methodology

In this section of the paper, the methodology will be discussed. The research design will be discussed, as well as the materials, the procedure, the pre-test, the respondents, the manipulation checks and finally the measurements, validity and reliability will be discussed.

3.1 Research design

The effects of background color and eye gazing were tested in a 2 (website context: government vs. hotel booking) by 2 (background color: warm vs. cool), by 2 (eye gaze: direct vs. averted) between subject design, with gender as a moderator. This resulted in four conditions per context and a total of eight conditions, which are shown in Figure 2.

Hotel booking website: **Government website:**

		Background color			
		Cool	Warm	Cool	Warm
Eye gazing	Averted	Condition 1 N = 52	Condition 4 N = 41	Condition 5 N = 50	Condition 7 N = 46
	Direct	Condition 2 N = 39	Condition 3 N = 58	Condition 6 N = 51	Condition 8 N = 48

Figure 2 *Conditions*

3.2 Materials

To manipulate the privacy risk perception, background colors and eye gazing were used on a website. There are three types of hues: primary, secondary, and tertiary hues (Bleicher, 2012). Primary hues are red, yellow, and blue. Primary colors cannot be broken down any further. Secondary colors occur when two equal parts of two primary colors are mixed. There are three secondary colors on the color wheel: orange, green and violet. Tertiary colors are a mix of secondary and primary colors and

together they account for six of the twelve colors on the color wheel (Bleicher, 2012). For both the warm and cool background color, a primary color was used. For the warm background color, orange was chosen and for the cool background color, blue. The background colors have been pre-tested as well, these results can be found in paragraph 3.3.

To manipulate the eye gazing, a photo of a woman was shown with a direct and averted eye gaze. In the research of Riegelsberger, et al. (2003) it was found that photos of women on e-commerce websites are perceived as more trustworthy than photos of men. The study of Buchan, et al. (2008) also show that one might have greater trust towards women than towards men. They indicate that women are believed to be more trustworthy than men. The study of Garbarino and Slonim (2009) indicates that both men and women trust women more than men. Therefore, in this study photos of women will be used to increase the perceived online privacy. The photograph of a woman with a direct and averted eye gaze was chosen from Shutterstock, a photo databank.

Two websites were designed to test the effect of background color and eye gazing photos. The first website that was designed is a government website. The second website is a hotel booking website. Both contexts are gender neutral which is important given the fact that gender is a moderator. The websites were designed in Canva where the background colors were chosen and adjusted.

3.3 Pre-test

A first pre-test was conducted with a focus group of four participants. The goal of the focus group was to determine which website contexts were perceived as most realistic. The hotel booking website, the government website and a poker website were shown. Participants indicated that the poker website did not look realistic in any way. The blue and orange background color did not fit the website context of a poker website. Therefore, it was decided to show the participants only the hotel booking website and government website for the rest of the focus group meeting. The focus group participants were shown different conditions of the hotel booking website and government website. Their opinion was asked about the colors that were used and several eye gazing photos have been shown. They were asked whether the website looked realistic and if they perceived it as a real hotel booking website or government website. Several comments were given by the focus group participants regarding the gazing

photo, some of the website pages and the color. However, all focus group participants indicated that the websites did not look realistic. After the focus group, some small adjustments were made.

A second pre-test was conducted among 11 participants after adjustments were made. All 11 participants indicated that they perceived the color as intended as well as the gazing photo and the website context. However, it was found again that the websites were not perceived as realistic.

Therefore, changes were made, and real photos were used as background photo on the website. A third pre-test was conducted among another 9 participants purely to test whether the websites were perceived as realistic websites. The outcomes indicated that the websites were perceived as realistic. The first webpage of each final condition is shown in figure 2 and figure 3. The final questionnaire can be found in Appendix I and all final materials can be found in Appendix II.

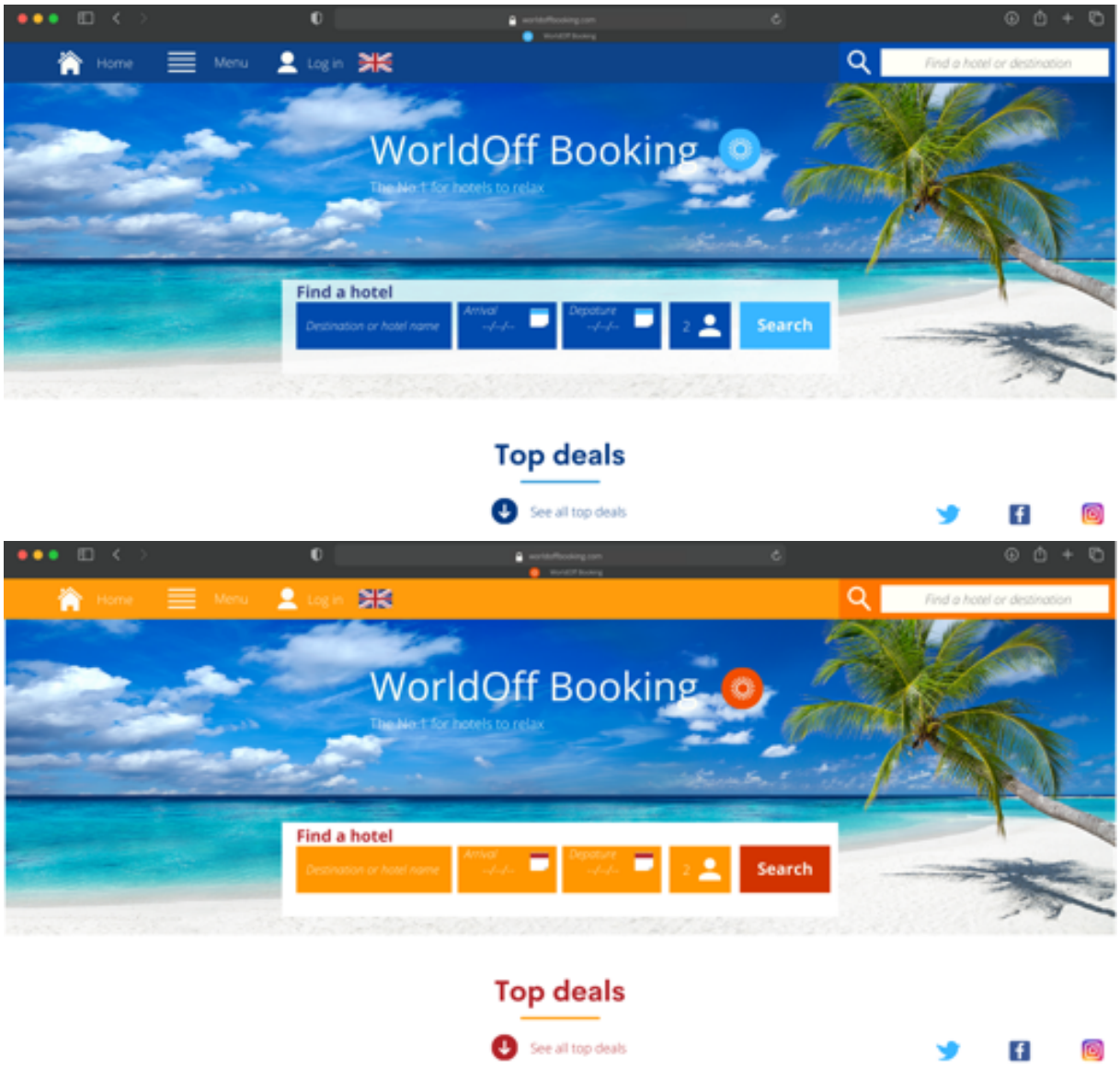

Figure 2 *Front pages hotel booking website*

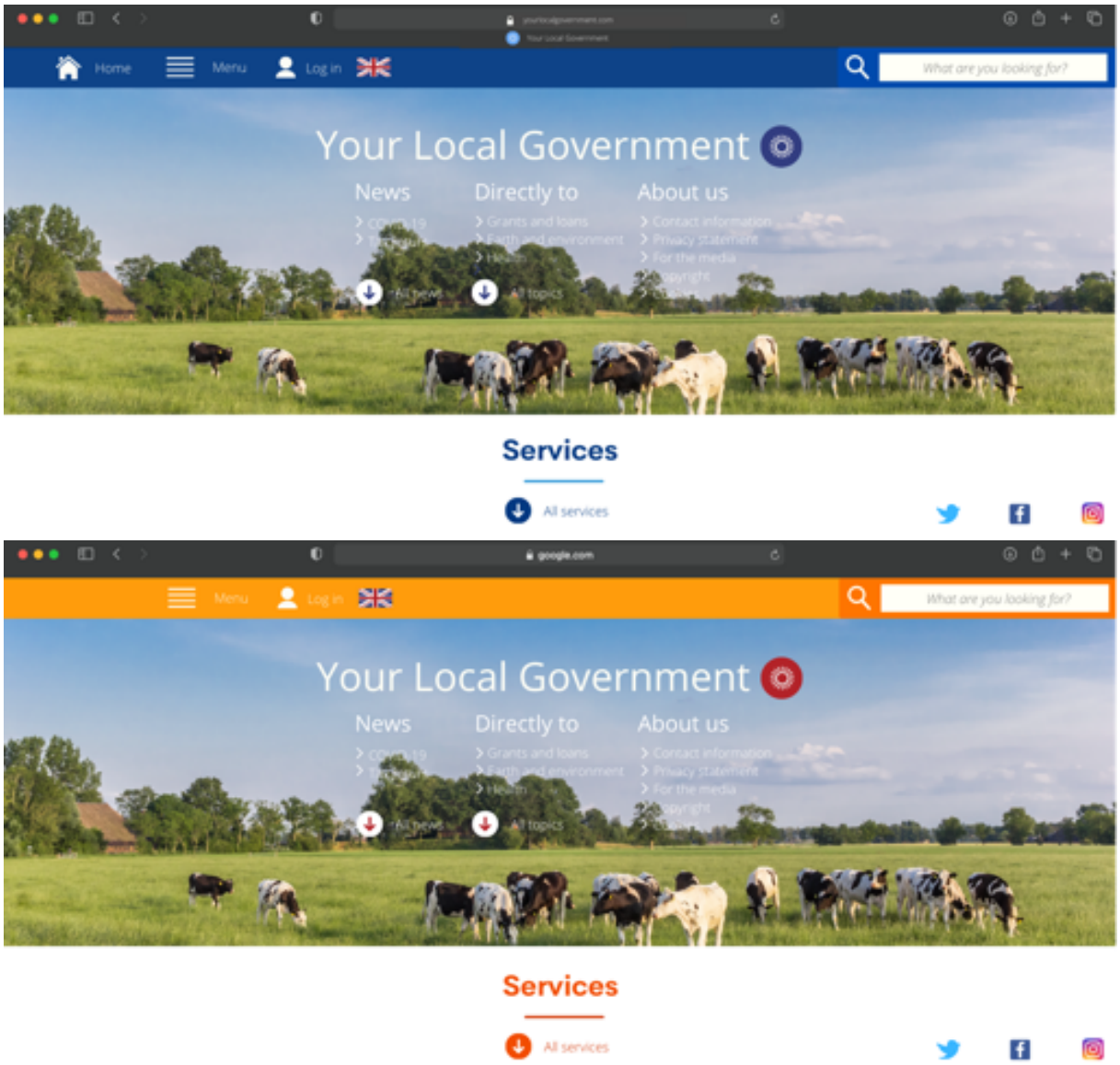

Figure 3 *Front pages government website*

3.4 Procedure

This experiment was an online experiment consisting of two website contexts, a hotel booking website and a government website. The effects were tested in a questionnaire. Gender as a moderator asked for a procedure to ensure the questionnaire was equally distributed among men and women. Therefore, to distribute the questionnaire equally, quota random sampling was used. The aim was to have at least 40 participants per condition. There were four conditions and two website contexts which resulted in a total of at least 320 participants.

The questionnaire started with a briefing and information about the experiment. Participants had to give consent before they could continue. Demographic information about the participants was

gathered. Each participant saw a different website, selected at random. Afterwards, every participant was asked the same questionnaire. This questionnaire can be found in Appendix I. The questions had to be answered on a five-point Likert scale, from 'strongly disagree' to 'strongly agree'. There were no restrictions about age, occupation, country of origin, etcetera. Only participants who are colorblind were excluded from participation.

3.5 Participants

3.5.1 Demographic information

For this study, a sample of 494 participants was gathered. Of the 494 responses, a total of 109 responses had to be removed from analysis because of the filter question (n = 12) and unfinished questionnaires (n = 97). The filter questions excluded color blind participants. The final dataset for this study has 385 valid responses.

The mean age of the respondents is 28.57 (SD = 11.59). Of the respondents, 60.8% (n = 234) has a Dutch nationality, 8.6% (n = 33) has a German nationality and 30.6% (n = 118) has a different nationality. Of the respondents, 46.8% (n = 180) identified themselves as male, 51.8% (n = 199) of the respondents identified themselves as female and 1.3% (n = 5) indicated other or prefer not to say. This allows gender to be a moderator because the distribution is almost equal. However, the distribution among the condition is not quite equal. Table 1 shows the demographic information of the participants for each condition.

Table 1 *demographic information*

	1 = Hotel, cool & averted	%	2 = Hotel, cool & direct	%	3 = Hotel, warm & direct	%	4 = Hotel, warm & averted	%	5 = Gover., cool & averted	%	6 = Govern., cool & direct	%	7 = Govern. warm & averted	%	8 = Govern., warm * direct	%
Male	23	12,8	15	8,2	33	18,3	19	10,6	19	10,6	27	15	21	11,7	25	13,9
Female	29	14,6	24	12,1	24	12,1	21	10,6	31	15,6	23	11,6	25	12,6	22	11,1
Other	0	0	1	20	1	20	1	20	0	0	1	20	0	0	1	20
Dutch	31	13,2	19	8,1	38	16,2	24	10,3	28	12	33	14,1	27	11,5	36	15,4
German	4	12,1	4	12,1	7	21,2	3	9,1	5	15,2	4	12,1	2	6,1	4	12,1
Other	17	14,4	18	15,3	13	11	14	11,9	17	14,4	14	11,9	17	14,4	8	6,8
<20	4	19	3	14,3	1	4,8	5	23,8	5	23,8	1	4,8	0	0	2	9,5
20-29	31	14,1	31	14	16,8	9,5	25	11,4	31	14,1	27	12,3	27	12,3	19	8,6
30-39	2	8,3	0	0	6	25	3	12,5	1	4,2	5	20,8	3	12,5	4	16,7
40-49	2	9,5	1	4,8	3	14,3	0	0	4	19	1	4,8	4	29	6	28,6
50-59	4	14,8	1	3,7	3	11,1	4	14,8	5	18,5	3	11,1	2	7,1	5	18,5
60-69	2	28,6	0	0	2	28,6	1	14,3	0	0	0	0	0	0	2	28,6
>70	0	0	0	0	0	0	0	0	0	0	0	0	1	50	1	50
Total	52	13,5	39	10,4	58	15,1	41	10,7	50	13	51	13,3	46	12	48	12,5

3.5.2 Pearson Chi-square

To test whether the observed distribution of the data fits the expected distribution, a Chi-square test is performed for gender, nationality, and age. All outcomes are not significant which means the distribution of age, gender and nationality among the conditions is equal. The results can be found below in Table 2.

Table 2 *Pearson Chi-square*

	Value	**df**	**Sig.**
Gender	18,70	21	.604
Nationality	13,65	14	.476
Age	62,27	56	.263

3.6 Measurements

The constructs that were measured are trust, perceived privacy risk, website design and eye gazing. The construct of trust was measured based on the three dimensions of trust: ability, integrity, and benevolence (Ganesan & Hess, 1997). The construct of privacy risk perception was measured with different items related to risk of loss of personal information. The construct of website design was measured with different items measuring the overall website design, look and the background color of the website was evaluated as well. The final construct, eye gazing, was measured with different items related to the woman on the website. Some extra questions of explorative nature were added to the questionnaire to evaluate the website. The complete questionnaire with the constructs can be found in Appendix I.

To test whether the questions were measuring the right construct, a factor analysis was conducted. The factor analysis indicates which questions measure which construct. By conducting a factor analysis, the validity of the research is ensured. To suppress small coefficients, the absolute value score was changed to below .5. The final factor analysis can be found in Table 3. Component 1 measures perceived risk, component 2 trust, component 3, website design and finally, component 4 measures gazing.

After the first factor analysis, two constructs have been removed from the questionnaire because they were indicated as invalid questions. Additionally, the statements of the construct perceived risk had to be recoded because they came out as negative factors. They are now reversed recoded, meaning that a high score on the privacy risk perception is in fact a lower privacy risk perception.

Table 3 *factor analysis*

Statements*	Component 1	2	3	4
I trust that this website will not share my personal data with other companies	.596			
I trust that this website will not sell my personal data to other companies	.678			
I feel like there is a risk that this website might share my personal data with other companies	.756			
I feel like there is a risk that this website might sell my personal data to other companies	.763			
I feel like this website will be inclined to share my personal data with other companies	.762			
I feel like this website will be inclined to sell my personal data to other companies	.751			
I feel like this website has no reason to share my personal data with other companies	.738			
I feel like this website has no reason to sell my personal data to other companies	.764			
I trust that this website has the ability to protect my personal information		.810		
I trust that this website is competent to protect my personal information		.806		
I trust that this website has the expertise to protect my personal information		.797		
I trust that this website has the best intentions with my personal data		.615		
I trust this website to be sincere		.736		
I do not doubt the honesty of this website		.682		
I trust that this website will keep the promises that they make		.736		
The website looks professional			.722	
The website looks attractive			.772	
The website is pleasant to look at			.804	
The color fits the website design			.849	
The color is in line with the context of the website			.813	
The woman makes me feel comfortable				.865
The woman makes me feel safe				.875
The woman makes me feel like she is there to help me				.844
The photo of the woman fits the website context				.790

* All items measured on a 5-point Likert scale (1 = strongly disagree / 5 =strongly agree)

To ensure the internal reliability, the Cronbach's Alpha was calculated. A construct is reliable if the Cronbach's Alpha is .70 or higher. The Cronbach's Alpha is calculated for every construct and can be found in Table 4.

Table 4 *mean and Cronbach's Alpha per construct*

Construct*	N-items	Mean	Cronbach's Alpha
Risk perception	8	3.01	.91
Trust	7	3.44	.92
Website evaluation	5	3.72	.89
Gazing	4	3.34	.89

*All items measured on a 5-point Liker scale (1 = strongly disagree / 5 = strongly agree)

3.7 Manipulation checks

In the final section of the questionnaire, manipulation checks were shown in order to ensure that the manipulations were perceived as intended. Respondents were asked to answer if the website looked like a hotel booking website or government website, whether the used color was a warm or cool color and whether the woman was looking away from them or looking directly at them. Table 5 shows an overview of the manipulation checks. All manipulation checks were successful which means the participants perceived the manipulations as intended.

Table 5 *manipulation checks*

Construct*	N-items	Mean	Sd**	t (df)	Sig.
The website I saw looks like a hotel booking/government website	385	3.55	1.124	61.92 (384)	<.0001
The woman was looking away from me/directly at me	385	4.05	.854	93.04 (384)	<.0001
The color on the website was a cool/warm color	384	4.00	.898	87.21 (383)	<.0001

*All items measured on a 5-point Liker scale (1 = strongly disagree / 5 = strongly agree)
** Standard deviation

4. Results

To test the hypotheses, several statistical tests have been performed and the results will be shown in this section. A multivariate analysis of variance has been performed, the main effects for trust and risk will be discussed as well as the interaction effects between the different variables. Furthermore, the mediating effect of trust on privacy risk perception will be examined. Additionally, the effects of the variables on gender will be discussed and finally, an overview of the hypotheses will be presented and whether they are rejected or supported.

4.1 Multivariate analysis of variance – MANOVA

A Multivariate analysis of variance has been performed. The results can be found in Table 6. The MANOVA shows the effects of the independent variables on trust and risk perception. Gender is also taken into account. The results show that there is a main effect for the effect of website context ($F(2, 352) = 17.21$, $p < .0001$) and a main effect for color ($F(2, 352) = 3.83$, $p = .023$).

An interaction effect has been found for website context, background color and eye gaze ($F(2, 352) = 4.84$ $p = .012$). Three marginally interaction effects have been found as well. For website context and background color ($F(2, 352) = 2.78$, $p = .063$), for website context and gender ($F(2, 353) = 2.58$, $p = .078$) and for background color and gender ($F(2, 352) = 2.48$, $p = .060$).

Table 6 *multivariate analysis of variance*

Effects Wilk's Lamba	**Value**	**F**	**Sig.**
Context	.911	17.21	< .0001
Background color	.979	3.83	.023
Eye gaze	1.00	.08	.924
Gender	.995	.94	.390
Context * background color	.984	2.78	.063
Context * gaze	.993	1.32	.268
Context * gender	.986	2.58	.078
Background color * eye gaze	1.00	.01	.991
Background color * gender	.984	2.84	.060
Eye gaze * gender	1.00	.08	.926
Context * background color * eye gaze	.975	4.48	.012
Context * background color * gender	.997	.49	.612
Context * eye gaze * gender	.994	1.08	.342
Context * background color * eye gaze * gender	.998	.35	.707

*All items measured on a 5-point Likert scale (1 = strongly disagree / 5 = strongly agree)

4.2 Trust

4.2.1 Main effects

For trust, it was found that there is a main effect for the website context on trust ($F(1, 357) = 13.20$, $p < .0001$), which is in line with hypotheses 5A and 5B. From the analysis it can be concluded that participants have a higher trust towards a government website ($M_{government} = 25.05$, SD =.374) as opposed to a hotel booking website ($M_{hotel} = 23.10$, SD = .385). As can be seen in Table 7, the main effects of background color and eye gaze were non-significant.

4.2.2 Interaction effects

Table 7 also shows a significant interaction effect between website context, background color and eye gaze ($F(1, 357) = 9.13$, $p = .003$). It was found that participants have most trust towards a government website with a cool color and a direct gazing ($M_{government,\ cool\ and\ direct} = 27.19$, SD = .733). In comparison to the government website, unexpectedly, participants have the least trust towards a hotel booking website, using a cool background color and direct eye gaze ($M_{hotel,\ cool\ and\ direct} = 21.91$, SD = .873). Figure 4 shows the interaction between the website context, background color, and eye gazing.

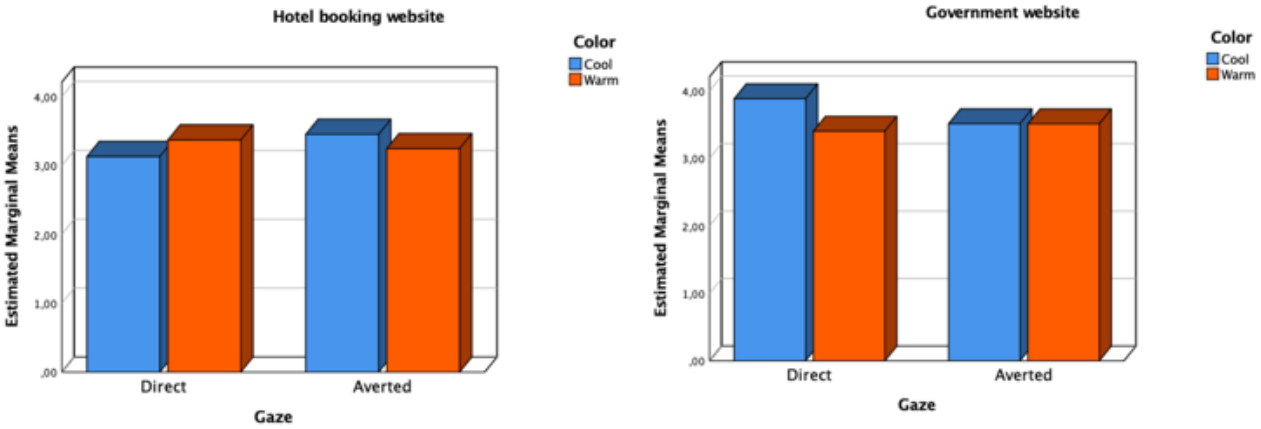

Figure 4 *interaction between context * color * gaze for trust*

***Table** 7 analysis of variance for trust*

Construct*	F	Sig.
Context	13.20	<.0001
Background color	2.16	.143
Eye gaze	.046	.830
Gender	.081	.776
Context * background color	2.83	.094
Context * eye gaze	2.25	.135
Context * gender	3.19	.075
Background color * eye gaze	.009	.924
Background color * gender	1.24	.26
Eye gaze * gender	.312	.577
Context * background color * eye gaze	9.13	.003
Context * background color * gender	.657	.418
Context * eye gaze * gender	3.27	.072
Context * eye gaze * gender	.399	.528
Context * background color * eye gaze * gender	.406	.525

*All items measured on a 5-point Likert scale (1 = strongly disagree / 5 = strongly agree)

4.3 Risk perception

4.2.1 Main effects

For the variable risk, it was found that there is a main effect of website context ($F(1, 356) = 34.88$, $p < .0001$) and for color ($F(1, 356) = 7.73$, $p < .006$). These results are in line with hypothesis 1 and 5A and 5B. From analysis it can be concluded that participants generally feel their personal information is less at risk at a government website ($M_{government}$ = 25.82, SD = .436) as opposed to a hotel booking website (M_{hotel} = 22.12, SD = .452). As expected, a cool color resulted in lower privacy

risk perception (M_{cool} = 24.84, SD = .449) as opposed to a warm color (M_{warm} = 23.01, SD = .439). Since the items are reverse recoded, a high score on privacy risk perception means the privacy risk perception is low. A complete overview of all variables can be found in Table 8. As can be seen in Table 8, no main effect has been found for eye gaze and therefore, hypothesis 2 is rejected.

Table 8 *analysis of variance for risk*

Construct *	**F**	**Sig.**
Context	34.88	< .0001
Color	7.73	.006
Gaze	.094	.759
Gender	.784	.377
Context * color	5.23	.023
Context * gaze	2.06	.152
Context * gender	5.36	.021
Color * gaze	.006	.936
Color * gender	5.89	.016
Gaze * gender	.101	.751
Context * color * gaze	3.17	.076
Context * color * gender	.448	.504
Context * gaze * gender	1.19	.277
Context * gaze * gender	2.18	.141
Context * color * gaze * gender	.687	.411

*All items measured on a 5-point Likert scale (1 = strongly disagree / 5 = strongly agree)

4.2.2 Interaction effects

There is a significant interaction effect found between website context and background color ($F(1, 356) = 5.23$, $p = .023$), website context and gender ($F(1, 356) = 5.36$, $p = .021$), background color and gender ($F(1,356) = 5.89$, $p = .016$) on privacy risk perception.

The interaction shows that a government with a cool background color results in lower privacy risk perception ($M_{government\ and\ cool}$ = 27.41, SD = .612), whereas for the hotel website the background

color does not make a difference for the privacy risk perception. Figure 5 shows an overview of the interaction between website context and background color. The figure clearly shows that for a cool background color has a great influence on the privacy risk perception on a government website, whereas it does not make any difference on a hotel booking website. Since the items are reverse recoded, a high score means lower privacy risk perception and a low score means higher privacy risk perception.

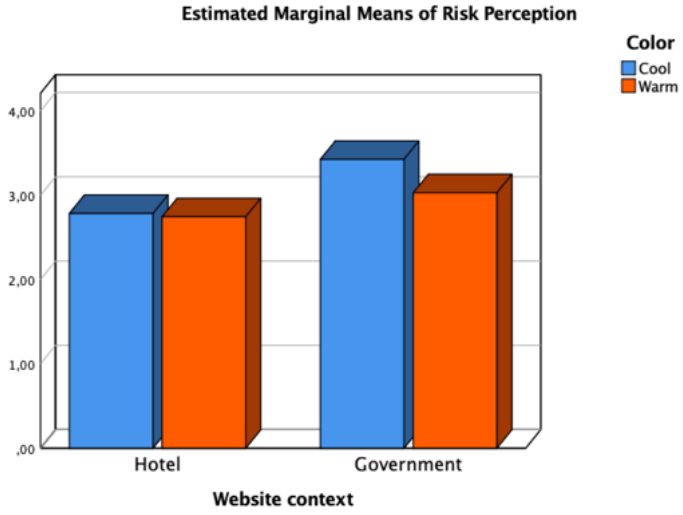

Figure 5 *interaction between website context*color for risk*

For the interaction of website context and gender it was found that especially male participants feel they are least at risk at a government website ($M_{government\ and\ male}$ = 26.27, SD = .635). However, male participants also feel they are most at risk on a hotel booking website ($M_{hotel\ and\ male}$ = 21.11, SD = .673). Female participants feel they are least at risk at a government website as well ($M_{female\ and\ government}$ = 25.38, SD = .597) as opposed to a hotel booking website ($M_{female\ and\ hotel}$ = 23.12, SD = .602). Figure 6 shows the interaction between gender and website context. As Figure 6 shows, the gender differences for the government website are small. However, for the hotel booking website it is clear that male participants experience higher privacy risk perception. Again, since the items are reverse recoded, a high score means lower privacy risk perception and a low score means higher privacy risk perception.

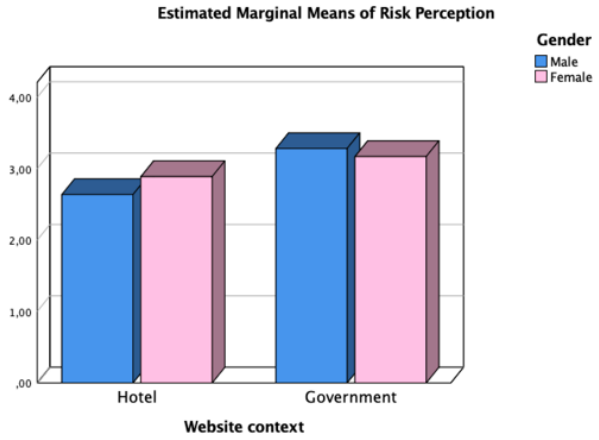

Figure 6 *interaction for website context * gender for risk*

The interaction between background color and gender shows that male participants perceived least risk of loss of personal data when a cool background color is used ($M_{male\ and\ cool}$ = 25.33, SD = .686). The male participants are also the once who feel most at risk of loss of personal data, but when a warm background color is used ($M_{male\ and\ warm}$ = 22.06, SD = .621). This can be seen in Figure 7.

Hypothesis 9 proposed that cool background colors will increase women's trust. For trust it shows an unsignificant result (F(1, 357) = 1,24, p = .266). For risk perception it shows a significant result (F (1, 356) = 5.89, p =.016). However, the means are not in line with the proposed hypothesis that a cool background color will lower the privacy risk perception for women. In fact, the graph in Figure 7 shows that women are even more affected by a warm background color. Therefore, hypothesis 9 should be rejected as well.

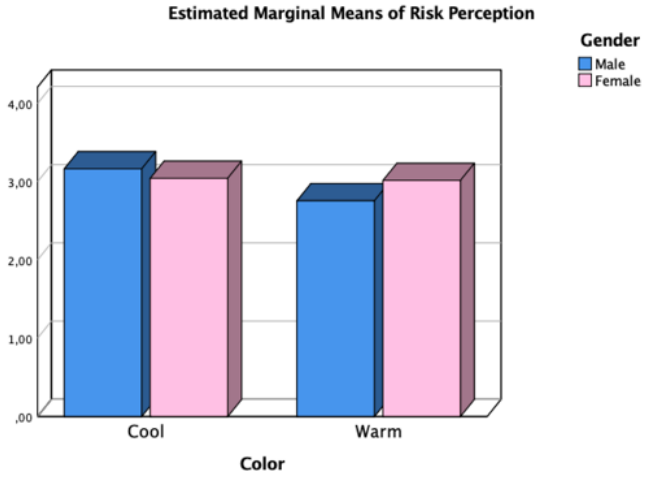

Figure 7 *gender * color for risk perception*

Hypotheses 3A and 3B proposed that the combination of a cool background color and direct eye gazing will increase trust towards a website the most, as opposed to any other combination. This interaction was not significant when measured for trust ($F(1, 357) = .009$, $p = .924$). The same goes for the interaction for background color and eye gaze measured for risk ($F(1, 356) = .006$, $p = .936$) and was also not significant. Therefore, it can be concluded that hypotheses 3A and 3B should be rejected.

Hypotheses 6A and 6B proposed that direct eye gazing will increase trust more on a commercial website as opposed to a non-commercial website, lowering privacy risk perception. However, there are no main effects found of the effect of eye gazing on trust or risk perception. The effect of eye gazing on trust is not significant ($F(1, 357) = .046$, $p = .830$) and no significant effects of eye gazing on risk perception have been found ($F(1, 356) = .094$, $p = .759$). Therefore, hypotheses 6A and 6B should be rejected.

Hypothesis 7A proposed that the use of a cool background color will increase trust towards a non-commercia website. Hypothesis 7B proposed that a cool background color will not increase trust towards a commercial website. The interaction for website context and background color is significant for risk ($F(1, 356) = 5.23$, $p = .023$). As for both trust and risk and every website context, the cool color has the greatest effect for increasing trust and lowering risk perception. However, as in line with the hypothesis, a cool color only has effect in a non-commercial website context. The results can be found below in Figure 8. Hypothesis 7A and 7B are supported.

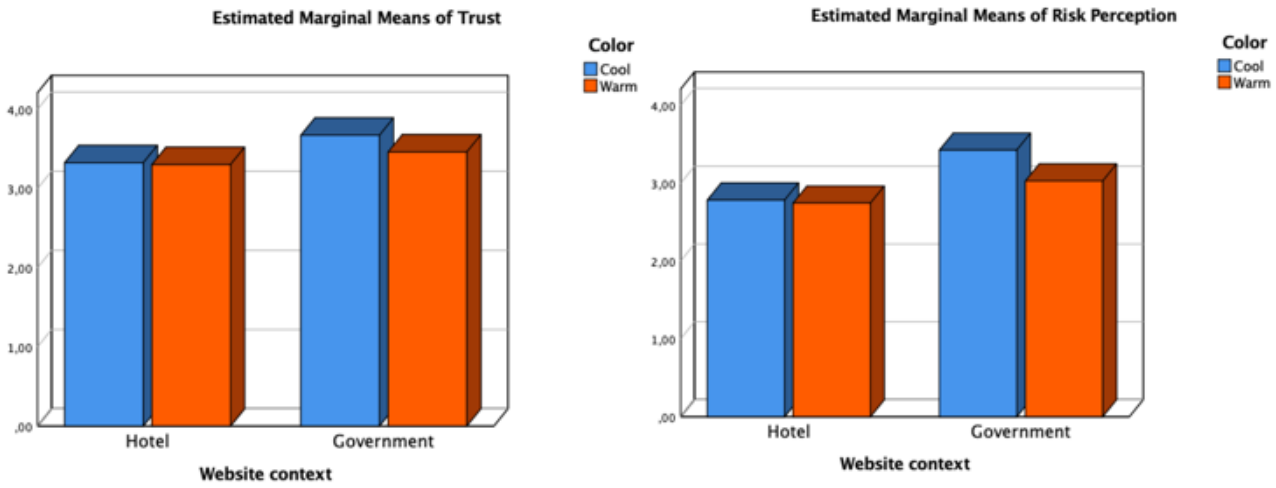

Figure 8 *color * context for trust and risk perception*

Based on theoretical evidence, gender was chosen as a moderator in this study. Hypothesis 8 proposed that eye gazing will affect women more strongly as opposed to men, resulting in an increase of trust and lower risk perception. Results from the multivariate analysis show that this is statistically not significant (F(.076), p = .926). Results from the analysis for risk (F(.101), p = .751) and for trust (F(.312), p = .577) also show that there are no significant results. Therefore, hypothesis 8 is rejected.

4.4 Mediating effect for trust on privacy risk perception

It was assumed that trust has a mediating effect on privacy risk perception, it was expected that when one has greater trust towards a website, the privacy risk perception will be lower. The regression model of Hayes has been used for analysis (Hayes, 2012).

First, the regression for the variable website context is tested. In the first step of the mediation model, the regression of website context on risk without trust was significant (b = .43, t (1, 377) = 5.57, p < .0001). The second step of the mediation model shows that the regression of website context on trust is significant (b = .26, t (1, 378) = 3.37, p = .001). Step three of the mediation model shows that the mediation effect of trust on risk is significant as well (b = .66, t (1, 374) = 15.42, p < .0001). The fourth step of the mediation model shows website context, mediated by trust for risk perception was not significant (b = -.16, t (2, 370) = -1.77, p = .0768). Therefore, it can be concluded that trust is a mediating factor for privacy risk perception for the variable website context. Figure 9 shows the mediation analysis for website context.

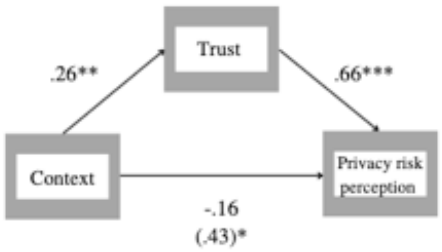

Figure 9 *mediation analysis for website context on privacy risk perception with trust as mediator.*

Note: *unstandardized coefficients and significant values (P* = .004, P** = .11, P*** < .0001)*

For color, the regression for color on risk without trust is significant (b = -.24, t (1, 377) = -2.93, p = .006). The regression for color on trust is not significant (b = -.12, t (1, 378) = -1.62, p = .11). The regression for trust on risk is significant (b = .66, t (1, 374) = 15.42, p < .0001). The last step of the regression, the effect of color, mediated by trust, was a significant predictor for risk perception (b = -.15, t (2, 374) = -2.43, p = .016). Therefore, it can be concluded that trust is not a mediating factor for privacy risk perception for the variable color. Figure 10 shows the mediation analysis for color on privacy risk perception.

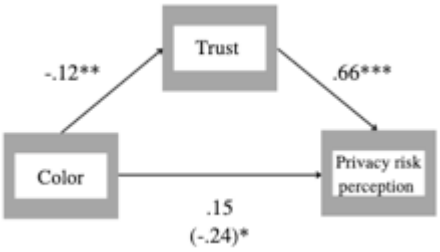

Figure 10 *mediation analysis for color on privacy risk perception with trust as mediator.*

Note: *unstandardized coefficients and significant values (P* = .004, P** = .11, P*** < .0001)*

For eye gaze, the regression for eye gaze on risk without the mediating effect of trust is not significant (b = -.04, t (1, 377) = -.48, p = .632). The regression for eye gaze on trust is not significant as well (b = -.03, t (1, 378) = -.35, p = .73). The regression for trust on risk appears to be significant (b = .66, t (1, 374) = 15.42, p < .0001). The regression for eye gaze, mediated by trust on risk is significant (b = .66, t (2, 374) = 15.39, p < .0001). Therefore, it can be concluded that trust is not a mediating variable for risk perception for the variable eye gazing as can be seen in Figure 11.

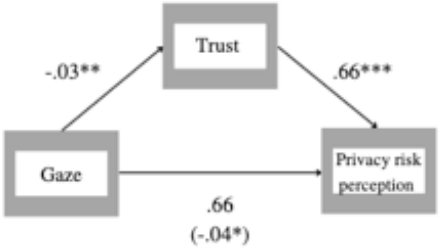

Figure 11 *mediation analysis for eye gaze on privacy risk perception with trust as mediator.*

Note: *unstandardized coefficients and significant values (P* = .632, P** = .73, P*** < .0001)*

Since trust only appears to be a mediating factor for website context, hypothesis 4 is partly supported.

4.5 Hypotheses overview

Table 9 shows a complete overview of the outcome of the hypotheses based on the results that are found.

Table 9 *hypotheses overview*

Hypothesis	Content	Result
1	The use of a cool background color (as opposed to a warm color) in website design will increase trust towards the website, resulting in a lower privacy risk perception.	**Supported**
2	Direct eye gazing (as opposed to averted eye gazing) in a photograph on the website will positively increase trust towards the website, resulting in lower privacy risk perception.	**Rejected**
3A	Congruent combinations of color and eye gaze will increase trust, resulting in lower privacy risk perception (as opposed to incongruent combinations).	**Rejected**
3B	Especially the combination of a cool background color and a direct gazing photo will increase trust towards the website, resulting in lower privacy risk perception.	**Rejected**
4	Higher trust towards a website will result in lower privacy risk perception.	**Partly supported**
5A	The level of trust regarding personal information on a non-commercial website is higher, resulting in lower privacy risk perception.	**Supported**
5B	The level of trust regarding personal information on a commercial website is lower, resulting in higher privacy risk perception.	**Supported**
6A	Eye gazing on a commercial website will increase the level of trust, resulting in lower privacy risk perception.	**Rejected**
6B	Eye gazing on a non-commercial website will not increase the level of trust, resulting in higher privacy risk perception.	**Rejected**
7A	Cool background colors will increase the level of trust for a non-commercial website, resulting in lower privacy risk perception.	**Supported**
7B	Cool background color will not increase the level of trust for a commercial website, resulting in higher privacy risk perception.	**Supported**
8	The effect of eye gazing on trust will be stronger for women as opposed to men, resulting in lower privacy risk perception.	**Rejected**
9	The effect of a cool background color on trust, will be stronger for women than for men, resulting in a lower privacy risk perception.	**Rejected**

5. Discussion

In this section, the results of the experiment will be discussed, the limitations will be pointed out and there will be a discussion of the practical implications. Additionally, suggestions for future research directions will be discussed.

5.1 Discussion of the results

The main goal of this study was to determine whether trust cues can influence users' privacy risk perception. It was expected that there would be a mediating effect of trust between the independent variables and privacy risk perception. It was tested whether website context, the use of background colors and eye gazing photos influenced trust, which would lower the privacy risk perception. By designing eight different website conditions it was expected that one or more conditions would influence the feelings of trust, lowering privacy risk perception. The moderating variable gender was taken into account as well.

The results of this study demonstrate that website context is an important determinant for trustworthiness towards a website. It was found that website context has an effect on both trust and privacy risk perception. Users have greater trust towards a government website as opposed to a hotel booking website, these findings are in line with the findings of the study of Beldad, et al. (2011). It was found by the authors that users are more afraid for loss of information privacy after commercial online exchanges as opposed to non-commercial municipality website. Mutimukwe, et al (2020) found that concerns about privacy risk perception is present in the contexts of e-commerce, e-government and social media. They found that the privacy risk perception is higher in an e-commerce and social media environment and lower in an e-government environment. The findings of this study are in line with these findings as well that users have greater trust towards a government website as opposed to a hotel booking website.

It was found that showing a cool background color increases the trustworthiness of the website. These results are in line with the findings of other studies. The study of Alberts and Van Der Geest (2011) found that the trustworthiness of a website can be increased by the use of a blue color. Kim and

Moon (1998) found as well that the use of a cool color is preferred over a warm color in the context of a cyber-banking environment. Belizzi and Hite (1992) found that people are more relaxed, calm, satisfied and comfortable under the influence of a blue color in a shopping related context. The findings of this study are in line with the findings of other studies. The findings indicate that presenting a cool color on a website, increases the trustworthiness of that website.

The results suggest an interaction between website context and background color. As explained before, both website context and background color have been found to have to be a significant determinant for trust. The results show that the combination of a government website combined with a cool color is perceived to be the most trustworthy website condition. It has been found that trust towards a government (non-commercial) website is higher than trust towards a hotel booking (commercial) website. Additionally, it has been found in this study, as in many other studies, that a blue color increases trust. Therefore, it was expected that this combination would be most trustworthy.

An interaction effect for website context, background color and eye gaze has been found. Eye gazing is only found to be a significant trust cue combined with other trust cues. The results show that when one is looking to a trustworthy website condition (government website with a cool color), eye gazing has an effect. Perhaps, when someone has trust towards the website based on the website context and the color that is presented, they are open to eye gaze. Based on the results of this study it can be concluded that participants are only open for the trust cue eye gaze when the participants look to a website condition that is trustworthy.

Based on existing literature, it was expected that women would be more affected by a cool color as opposed to men. However, the results show the complete opposite result. Women are more affected by the warm color. A possible explanation for this could be that more than 60% of the participants had a Dutch nationality and orange is a national color of the Netherlands. Lakens (2011) found that Dutch people perceive the orange color as a representation of the Netherlands, and they evaluate orange as positive. He found that Dutch peoples' perception can be influenced by the color and orange carries a psychological meaning for Dutch people. This could be a possible explanation that the cool background color had less effect than expected, since Dutch participants are very open to the orange color.

The results indicate that trust only has a mediating effect for website context on the privacy risk perception which means that when one has greater trust towards a website, privacy risk perception is lower. However, for the other variables this mediating effect was not found. Other researchers found that found that trust is an important determinant to what extent users are willing to take a risk when it comes to their personal information (Kim, et al., 2008; Mayer, et al., 1995; Morosan & DeFranco, 2015). Eye gazing had no effect in this study on any of the variables and, therefore, it is not surprising that there is no mediating effect for trust. However, for background color there is a significant effect when it comes to risk perception. The findings show that background color has a direct effect on privacy risk perception, without mediation of trust. This is in line with the findings of Leonard (1997) who found that background colors are related to risk perception. He found for example that orange is a warning signal for danger and people perceive there is a risk.

It was found that eye gazing did not impact the perception of trust and privacy risk perception. A possible explanation for this can be that the photo of the woman did not fit the website design well enough. As stated by Riegelsberger et al (2013), in order to increase the trustworthiness of a website, the photo has to fit the design of the website and not any general stock photo can be used. Another possible explanation for the lack of effect of eye gaze can be that the photo was not explicit enough. The photo has been pre-tested, and it was well received. However, during the pre-test, specific questions about the photo were asked which made the participants notice the picture. During the actual questionnaire, participants were shown three webpages and on the final page the photo of the woman was shown. Participants could not go back during the questionnaire so perhaps they did not remember the woman very well since many elements were present in the website design. The size of the photo was not that big that it imminently drew attention. As stated by Ogonowski, et al. (2014) social presence is relevant in an online e-commerce environment. It was found by Karimov et al. (2011) as well that including human-like features on e-commerce websites increase consumers' trust and the study of Riegelsberger, et al. (2003) is in line with this finding as well that photos of people increase trust towards e-commerce websites. Therefore, a possible explanation for the lack of effect for eye gaze could be that the gazing photo of the woman does not fit the website context.

5.2 Discussion of the practical implications

Several practical implications are found that are useful. It was found, as by many other studies, that color has a significant effect on the feelings of trustworthiness of the user. Color has the ability the influence users in many different ways, but the findings of this study suggest using a blue background color to increase trust towards the website which results in lower privacy risk perception.

Additionally, the congruency of the website context and background color is something to consider. The results show that website context is a determinant for trust towards the website. Participants have greater trust towards a government website as opposed to a hotel booking website. However, when the government website is combined with a warm background color, trust towards the website decreases. Therefore, combinations that enhance trust separately should be combined.

Finally, the effect of color on the nationally of users should be considered. When designing a website that is for a national public, the national color can influence feelings and the perception of users. However, one should be cautious because color brings meaning as a national color but of course brings other intrinsic meaning as well. For example, yellow can be a national color that brings meaning, but it is also a very happy color which should fit the website context as well.

Website context has been found to be a significant determinant for trust towards a website. However, when one is designing a website the website context cannot be chosen anymore.

5.3 Limitations

The first limitation of this study are the photos that are used on the front page of the websites. For both the government website as the hotel booking website a photo with a clear, blue sky was used. The materials can be found in appendix II. However, these photos could have negatively influenced the perception of the color used on the website. The blue conditions contained more of blue, and the orange conditions contained blue as well which could have influenced the perception of trustworthiness. The warm color could have been perceived differently when a photo with a warmer color was chosen for the background. As found by Luo and Tang (2008), most of what someone sees in a photo is the color. They state that to reduce distraction, a simple background should be used, and attention should be paid to the color in the photo. The color distribution of the background photo should be simple. Based on this

information it can be concluded that the color of the photo might have had an effect on the participants which especially could be a problem in the orange condition. However, especially for the hotel booking website, participants should be able to visualize where they are going and what it looks like. Jenkins (2003) found that the visual image presented is an important determinant to inspire travelers. The kind of photos used for travel brochures are always vibrant, colorful, and used to influence people's mood and feelings (Jenkins, 2003). From the first pre-test it became clear that a hotel booking website without a background photo was perceived far from realistic. However, including a photo will always influence participants feelings. Therefore, it could be perhaps concluded that the hotel booking website is not the best website context to test these trust cues since the included photos always will trigger some feelings which could mislead the actual effect of the trust cues.

The second limitation of this study could be the number of pages of the website shown. The total number of pages of the website is three. Three pages could be considered as not completely realistic because a real website would have more pages. However, on the other hand, the pages contained a lot of information and participants could not go back to the materials during the questionnaire. Perhaps participants could not take in all information. For example, maybe they could not remember the eye gaze direction of the woman or maybe they could not remember the woman at all since so many elements were presented on the website.

Another limitation of the study is the distribution of men and women among the conditions. Gender has been taken into account as a moderator in this study. For gender to be a moderator, equal distribution among the conditions is essential. However, especially the distribution of male participants was not equal. Condition two has only been seen by 15 men whereas condition three has been seen by 33 male participants. Additionally, condition two has only been seen by 39 participants whereas the other conditions have been seen by approximately 50 participants. The facto that the distribution of men was not equal could have had a great impact on the results and it could be even questions whether gender is allowed to be a moderator in this study.

The final limitation of this study is the sample of the population. During this study, anyone could participate and there were no restrictions regarding nationality. However, not every culture responds the same to color and eye gazing. It has been found that eye gazing is universally an important social cue,

it can have different meanings across cultures (Adams, et al., 2009). It has been found that eye gazing is a form of respect in Western cultures (Argyle & Cook, 1976) whereas in East Asian cultures, eye contact can be interpreted as impolite and threatening (Knapp & Hall, 2002). Knapp and Hall (2002) found as well that averted eye gazing in East Asian cultures is seen as respectful. Additionally, color has different meaning in different cultures. The study of Park and Guerin (2008) found there is significant different meaning to colors between Western Cultures and Eastern cultures. It was found by Wiegersma and Van Der Elst (1988) that blue is preferred general across all cultures, but orange is a feared color in for example India. 60.8% of the respondents of the sample had a Dutch nationality, 8.6% had a German nationality and 30.6% indicated to be from a different nationality. Even though it is unknown what their nationality is, it could be possible that they have an Eastern (Asian) nationality. This could be a possible explanation why eye gazing had no effect on trust and risk perception since direct eye gazing is perceived as impolite. The cultural differences regarding these types of trust cues could be considered for future research.

5.4 Future research directions

There are endless ways to continue to research the effect of trust cues on privacy risk perception. The same format of this study could be used but with different trust cues. Different trust cues could be researched and what the possible effects are on the users' privacy risk perception. Trust cues such as privacy statements could be researched in combination with other design elements of a website such as interface, font style and overall aesthetics.

Another possible research direction is to continue with the present study with a more explicit and present gazing photo and a photo on the front page that is in line with the colors used.

The same study could be conducted but with a different number of web pages. Perhaps the website could be clickable, and participants could be shown a scenario where they must navigate through the website themselves. Possibly they take the trust cues in better since they really must interact with the website and based on the scenario and they are actively looking for something on the website.

6. Conclusion

Privacy risk perception is an important topic nowadays since internet is a major part of our daily lives. Concerns about the use and misuse of our personal information are part of our worries. Lowering users' privacy risk perception can be done by influencing their feelings of trustworthiness towards the website. This study tried to influence privacy risk perception through trust by manipulation the background colors on the website, the website context and including an averted and direct gazing woman on the website. This research made a start by studying possible trust cues to lower privacy risk perception, but many other trust cues can be explored to contribute to the topic of privacy risk perception. Future research is needed to study the effects of different trust cues, the interactions between the trust cues and the effects on privacy risk perception to lower users' concerns.

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8. Appendix

Appendix I – questionnaire

Dear participant,

I am a master student at the University of Twente and currently I am working on my master thesis. Therefore, I would kindly ask you to participate in this questionnaire.

My master thesis is about privacy risk perception. Eight different website conditions have been designed and you will be shown **one** website at random. Please keep in mind that there are no right or wrong answers and I just want to know how you feel about the website.

This online questionnaire will take approximately 10 minutes of your time. Your participation in this study is completely voluntary. You can stop the questionnaire at any time, and you may decide not to answer any specific question. Your responses are completely anonymous and confidential. Furthermore, the data we collect will only be used for our own research.

If you have any questions about this questionnaire, please do not hesitate to contact me via: c.e.ipskamp@student.utwente.nl.

I truly value your opinion!

Kind regards,

Charlotte Ipskamp

Demographic information

1. What is your age? (in numbers)

2. What is your gender

Male

Female

Other

Prefer not to say

3. What is your nationality?

Dutch

German

Chinese

Spanish

Other

4. Are you color blind?

No

Yes → if yes excluded from participation

Please indicate to what extent you agree with the following statements.

	Strongly disagree	**Disagree**	**Neither disagree nor agree**	**Agree**	**Strongly agree**
I trust that this website has the ability to protect my personal information					
I trust that this website is competent to protect my personal information					
I trust that this website has the expertise to protect my personal information					
I trust that this website will not share my personal data with other companies					
I trust that this website will not sell my data to other companies					
I trust that this website has the best intentions with my personal data					
I trust this website to be sincere					
I do not doubt the honesty of this website					
I trust that this website will keep promises that they make					
I feel I take a risk leaving my personal information at this website					
I would be willing to share my personal information with this website					
I feel like there is a risk that this website might share my personal data with other companies					
I feel like there is a risk that this website might sell my personal data to other companies					
The website looks professional					
The website looks attractive					
The website is pleasant to look at					
The color fits the website design					
The color is in line with the context of the website					
The woman makes me feel comfortable					
The woman makes me feel safe					
The woman makes me feel like she is there to help me					
The photo of the woman fits the website context					
I feel like a commercial website will be more inclined to share my personal data with other companies					
I feel like a commercial website will be more inclined to sell my personal data to other companies					

I feel like a non-commercial website has no reason to share my personal data with other companies	
I feel like a non-commercial website has no reason the sell my personal data to other companies	

Please indicate to what extent you agree with the following statements.

Manipulation checks (Only the statement relating to the context will be shown, so depending on cool, commercial, etc.)	**Strongly disagree**	**Disagree**	**Neither disagree nor agree**	**Agree**	**Strongly agree**
The website I saw looks like a government/hotel booking website					
The website design fits the website context					
The website looks realistic					
The color on the website is a cool/warm color					
The woman was looking directly at me/looking away					
The website looks like a commercial/non-commercial website					

Dear participant,

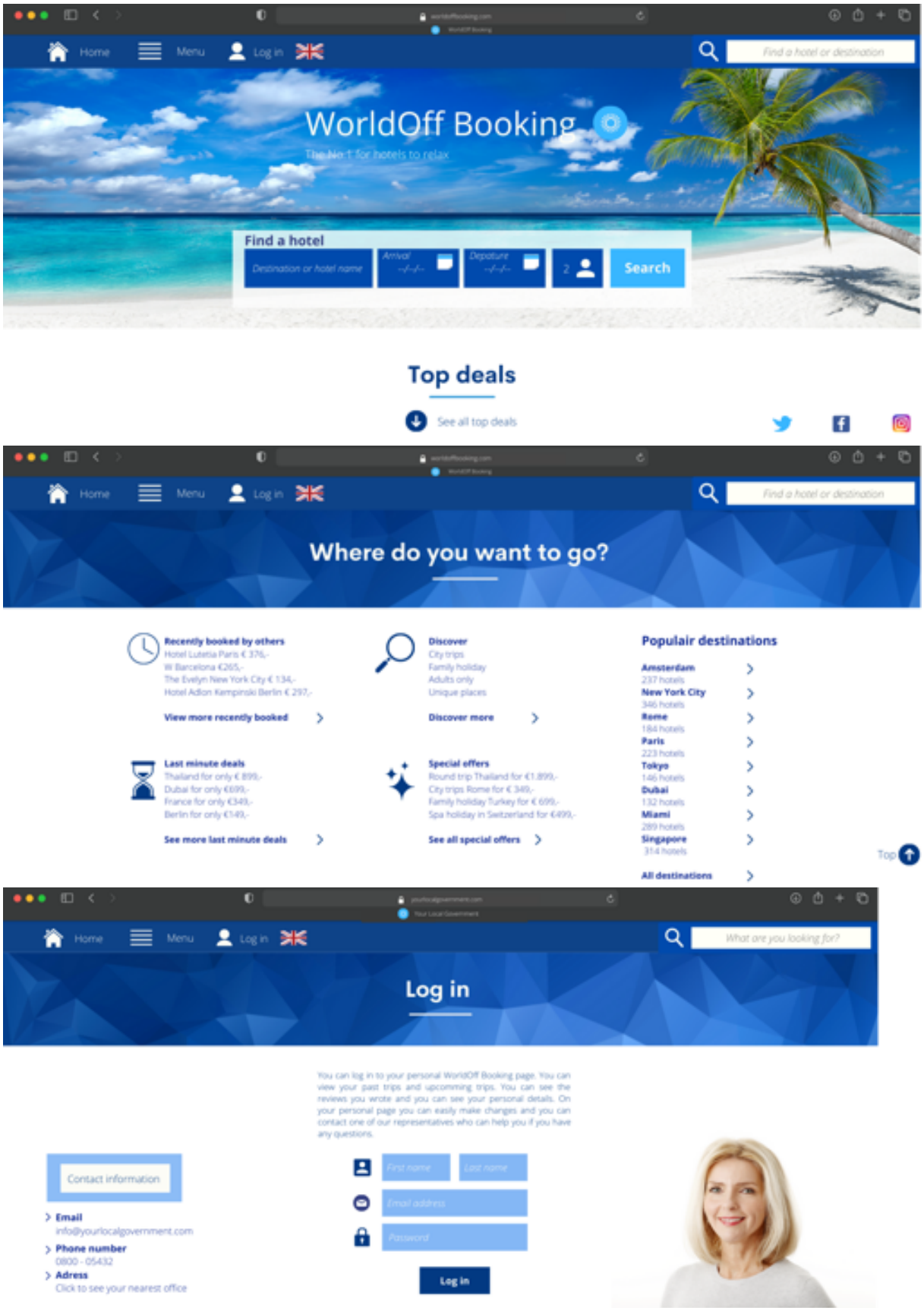
Your answers are saved! Thank you again for participating in this study about the effects of trust cues in website design on users' privacy risk perception.

I kindly ask you to not discuss the content of this study with anyone who is participating or might participate in this study in order to guarantee the validity of the results. Please, feel free to contact me when you have any questions. You can contact me at: c.e.ipskamp@student.utwente.nl

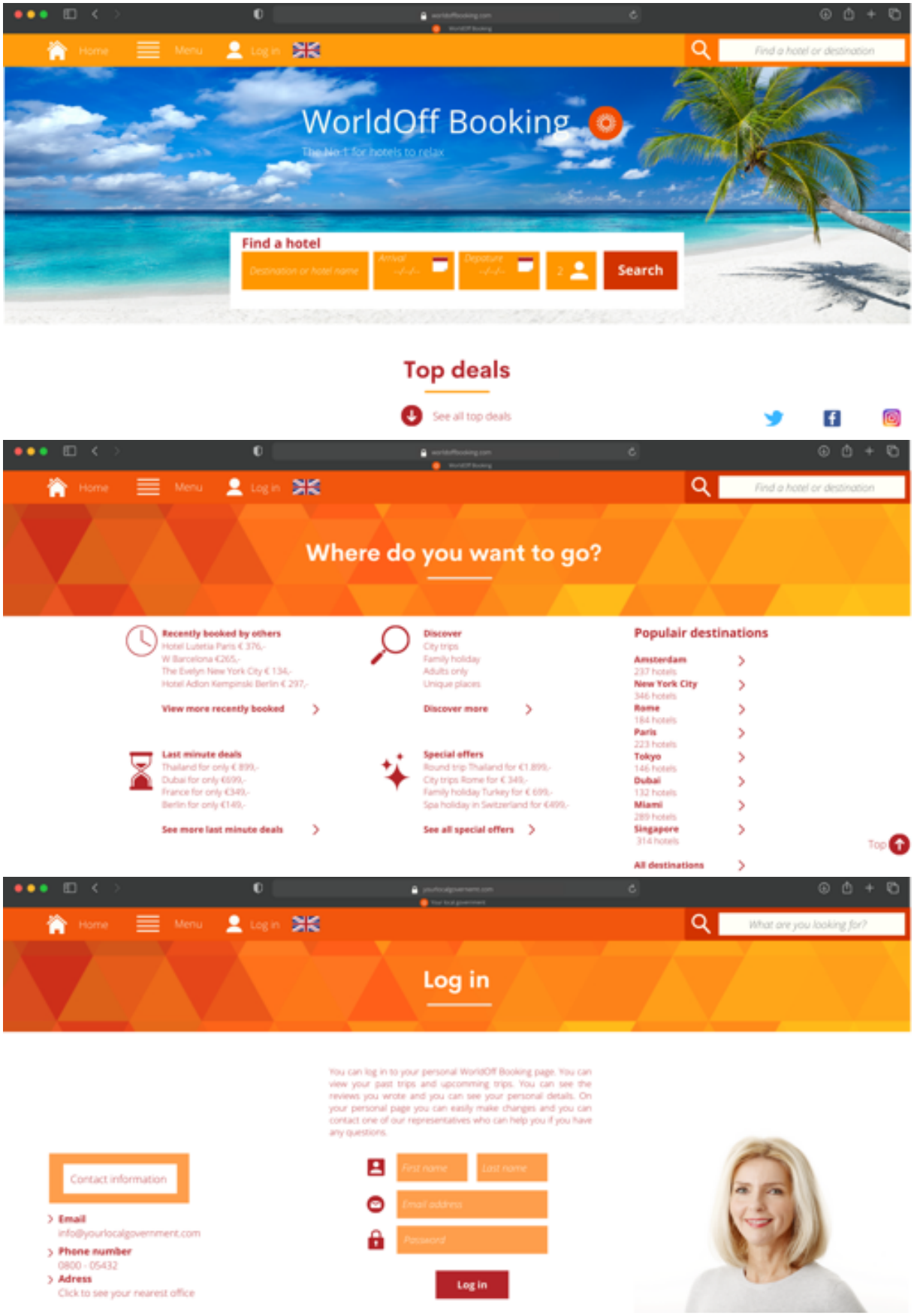
I want to thank you again for your time and opinion!

Appendix II - website conditions

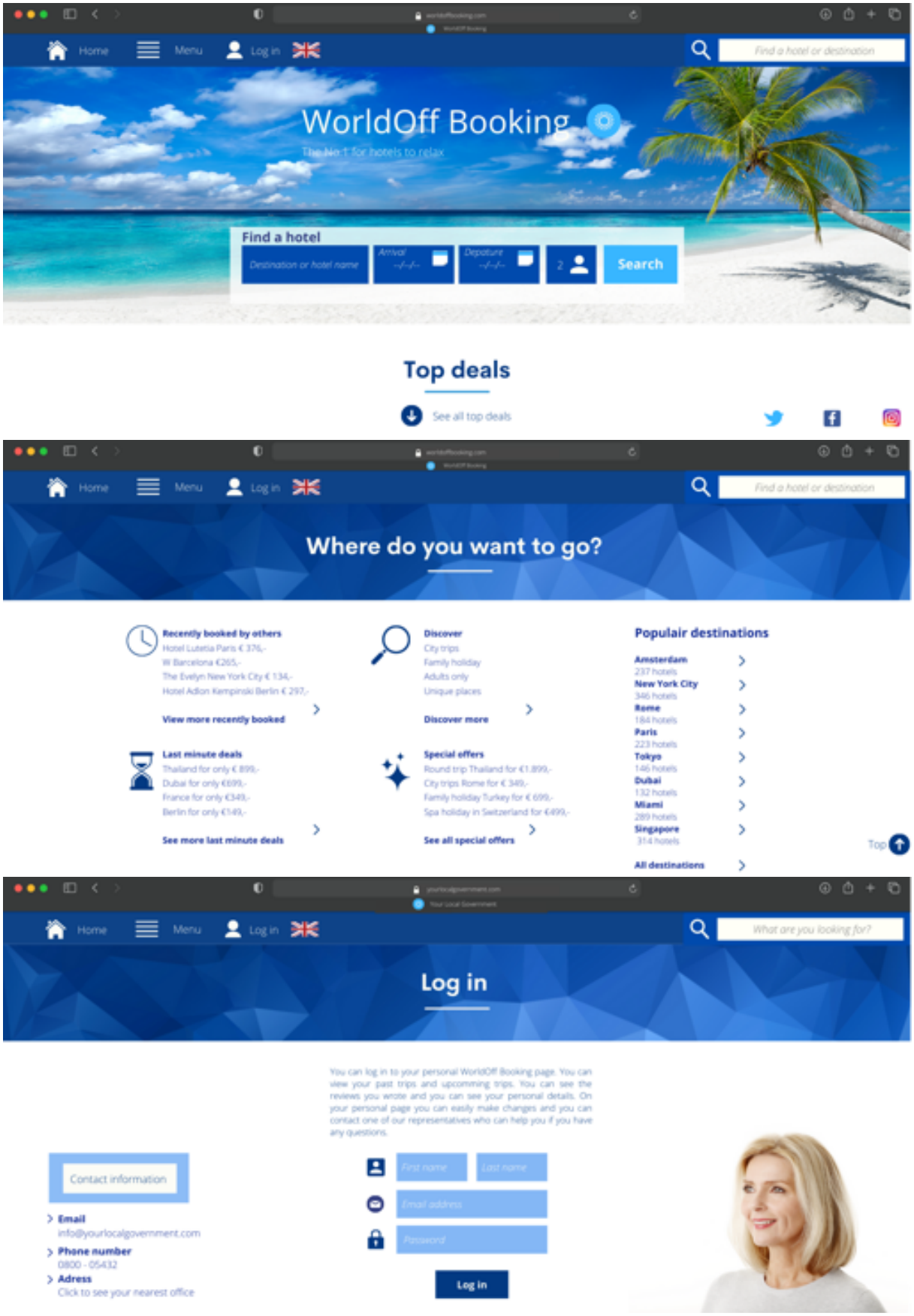
Condition 1: *hotel booking website, cool color and direct gaze*



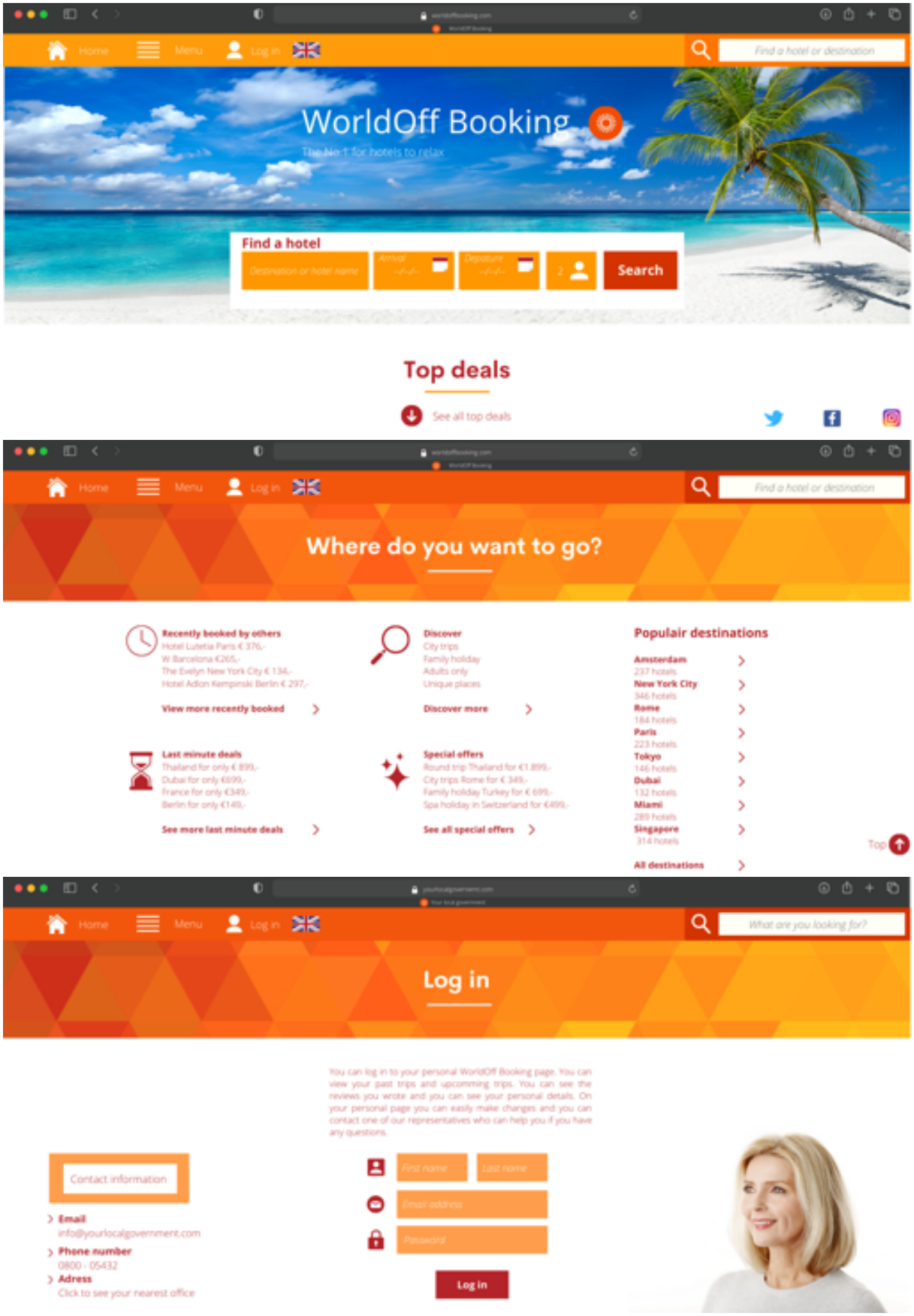
***Condition 2**: hotel booking website, warm color and direct gaze*



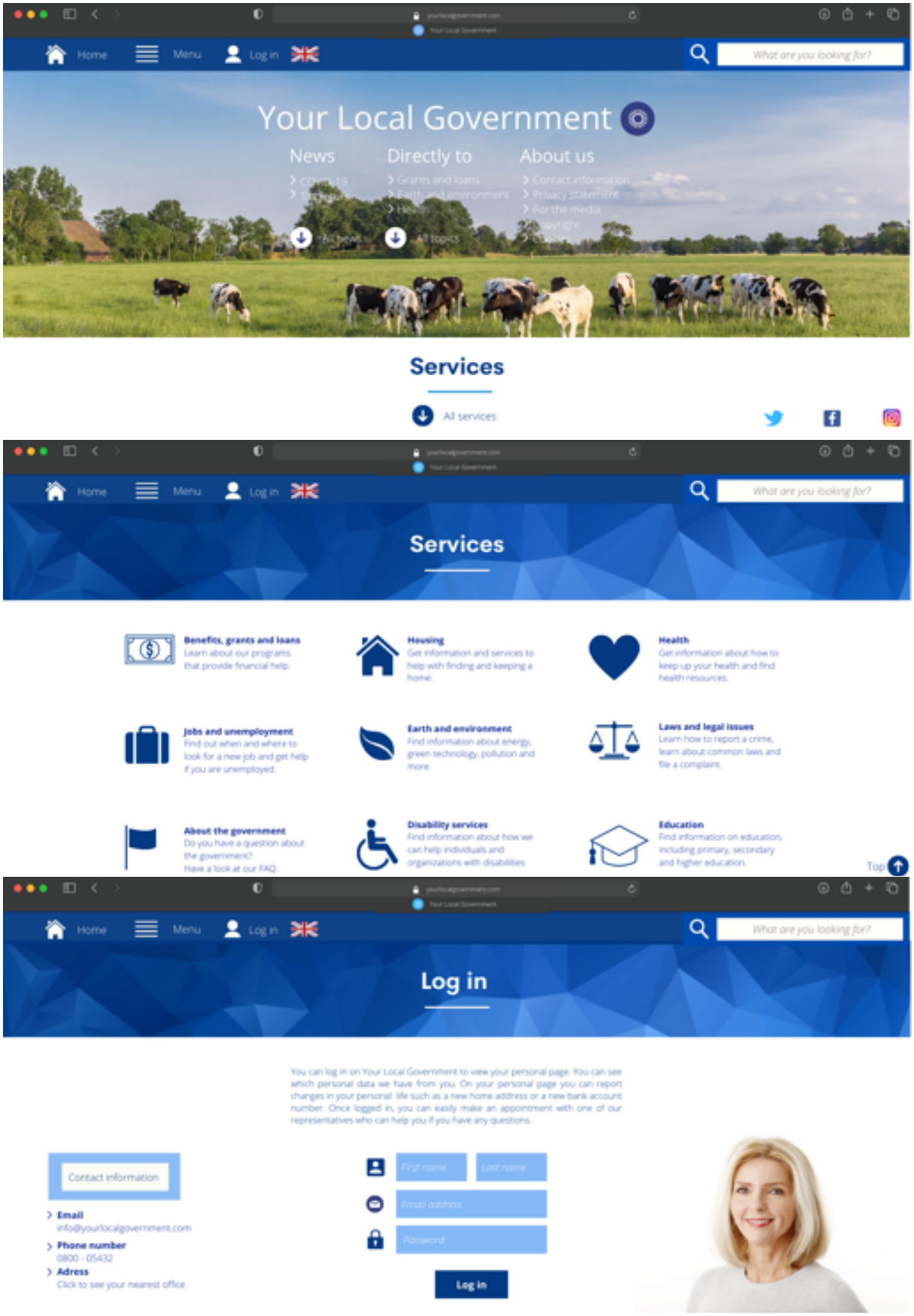
Condition three: *hotel booking website, cool color and averted gaze*



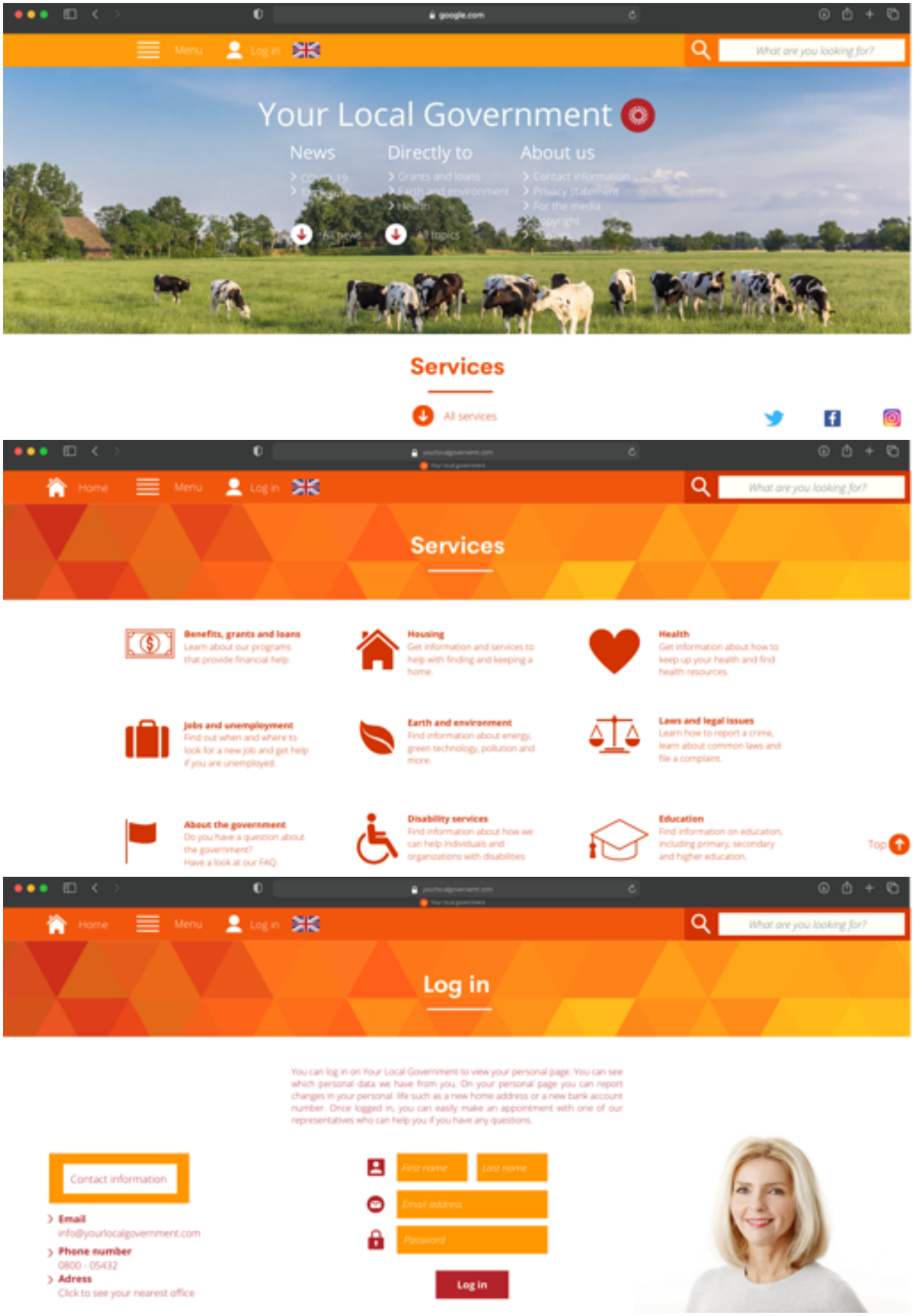
Condition 4: *hotel booking website, warm color and averted gaze*



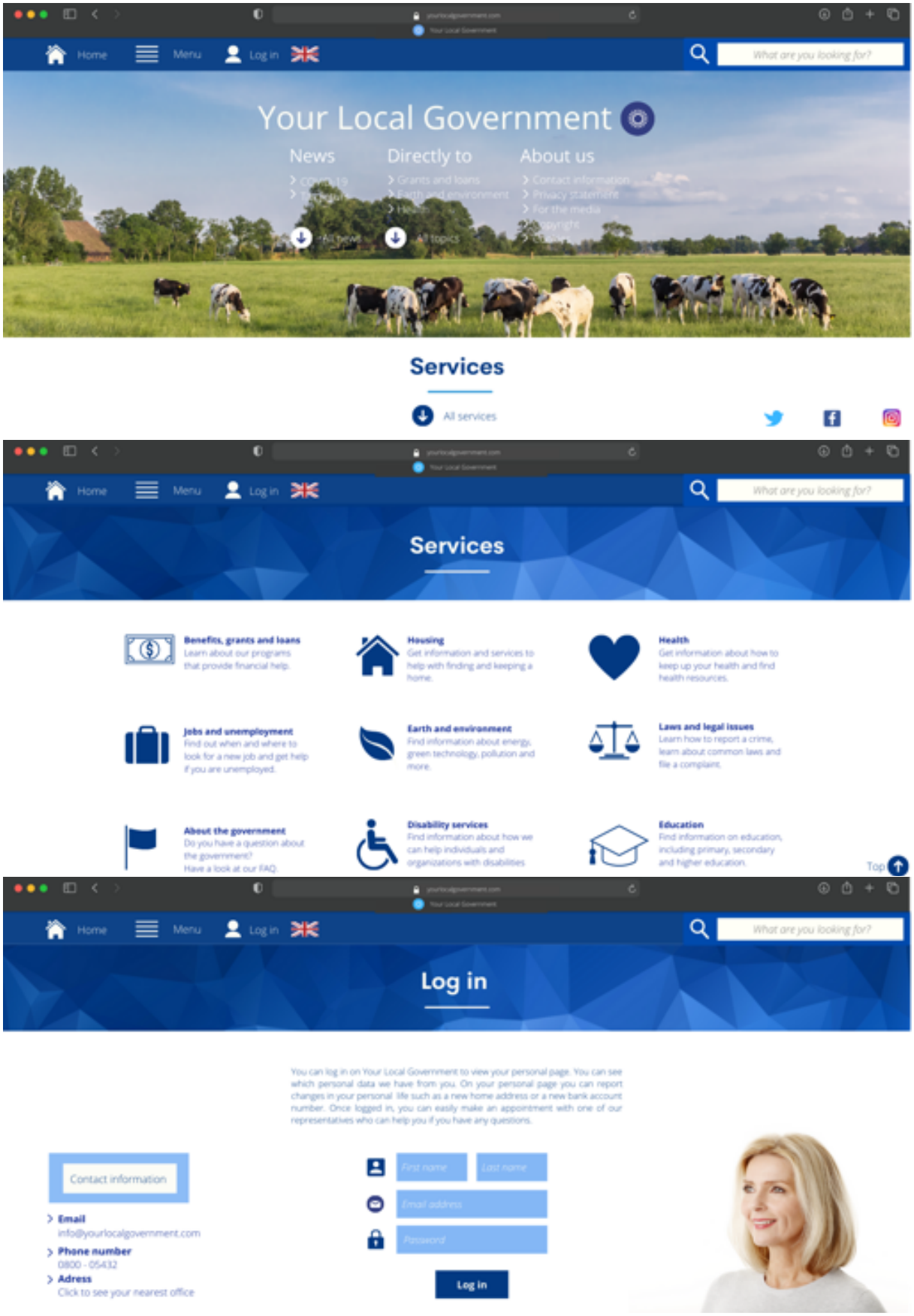
Condition 5: *government website, cool color and direct gaze*



Condition 6: *government website, warm color and direct gaze*



Condition 7: *government website, cool color and averted gaze*



Condition 8: *government website, warm color and averted gaze*