UNIVERSITY OF TWENTE.

Master Thesis

Only 1 room left: do you believe it?

The role of website design and skepticism towards advertising in trustworthiness of scarcity and social proof principles.

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Abstract

This study addresses the role of website design and skepticism towards advertising on the trustworthiness of scarcity and social proof principles. Current studies on persuasive principles mainly focus on the factors that play a role in the effectiveness of persuasive messages, but do not consider the trustworthiness of these messages. This study examines the trustworthiness of two of Cialdini's following principles of persuasion, namely: scarcity and social proof. The study was conducted in the context of an online travel agent website, a place where these types of tactics are often used. A 3 (website design: graphic design, control condition, social cue design) x 2 (skepticism towards advertising: low, high) study was conducted among 202 participants. The results indicate that website design does play a role in the trustworthiness (and appreciation) of scarcity and social proof principles, but only when skepticism towards advertising is also taken into account. This interaction effect also applies to perceived use of sales techniques. In addition, the research shows that skepticism towards advertising has an effect on (1) trustworthiness- and (2) appreciation of scarcity and social proof principles, (3) encouragement to book, (4) online trust, (5) purchase intention, (6) perceived risk and (7) website evaluation. This research thus contributes to the current literature on website design and trustworthiness of Cialdini's principles of persuasion.

Keywords: Cialdini, persuasion, website design, online trust, skepticism towards advertising

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1. Introduction

In recent years, an increasing number of behavioral science researchers and psychologists have conducted research on directing behavior using persuasion tactics. And while in the past these studies were primarily focused on face-to-face communication, today they are also being applied in ecommerce (Kaptein & Eckles, 2012). Kaptein and Eckles (2012) argue that the use of influence strategies such as consensus, authority and scarcity showed significant effects in both field and laboratory experiments. Online web stores use, for example, ratings from previous buyers (consensus), recommendations from experts (authority) or information about the (limited) stock (scarcity) to persuade visitors to buy from them (Kaptein & Eckles, 2012).

Cialdini (2007) was one of the first researchers to study the use of persuasive strategies. In his most famous work (the book *Influence*), Cialdini (2007) states that there are six (later seven) strategies that make people more likely to say 'yes' to a particular offer. In 2021, Cialdini's work is still highly relevant, given the widespread applications of some of his techniques (Kaptein & Eckles, 2012). In ecommerce, we often see Cialdini's scarcity and social proof principles (Fenko et al., 2017). Scarcity is about the idea that people give a product a higher value when it is scarce (Cialdini, 2007). Online travel agents use scarcity by placing statements such as, "only 1 room left for this price" or "only 2 more in stock".

Social proof is about the fact that people like to follow other people. Cialdini (2007) state that people need others to determine what is right. People believe that they should do what others do because that is the right way. Online travel agents use statements like "this hotel room is rated 5 stars by 2500 travelers" to convince people to book the hotel.

Multiple studies show that the effectiveness of persuasion strategies is determined by several factors (e.g., Sanders, 2015; Oyibo et al., 2017). For example, the work of Oyibo et al.

(2017) argues that the big five personality traits can play a role in the effectiveness of persuasion techniques. In the study, the researchers show that people who score high on the personality trait conscientiousness, are more sensitive to commitment and reciprocity. People who score high on agreeableness are more sensitive to authority, commitment and liking. Hirsh et al. (2015) also argue that persuasive messages are more effective when they are tailored to the individual. This research is consistent with the work of Oyibo et al. (2017), as it states that customizing the persuasive message based on the personality trait of the individual can be an effective way to increase the impact of the message.

Current literature focuses primarily on the effectiveness of persuasive messages. However, little research has been done on the trustworthiness of these persuasive messages. The current literature is mainly limited to trustworthiness of websites in general and the factors involved (e.g., Wang & Emurian, 2005; Douglass et al., 2010; Karimov et al., 2011; Seckler et al., 2015). For example, Wang & Emurian (2005) argue that website design has a significant impact on online trust. Douglass et al. (2010) conducted research on the role font has on online trust, which appeared to have a significant effect.

Another factor that may play a role in the trustworthiness of persuasive messages is persuasion knowledge. Persuasion knowledge was first mentioned by Friestad and Wright in 1994. These researchers argue that consumers develop knowledge over the years about the tactics and techniques used by sales people. This knowledge is used to guard against persuasion tactics. Obermiller and Spangenberg (1998) argue that skepticism towards advertising is one of the consequences of persuasion knowledge. Skepticism towards advertising is defined by Obermiller and Spangenberg (1998) as "the tendency toward disbelief of advertising claims" (p.

160). The researchers argue that skepticism towards advertising occurs in every free market. Therefore, it could have an effect on online travel agent websites.

Based on this literature, the following research question has been been defined:

"To what extent does website design affect trustworthiness of scarcity and social proof principles in an online travel context and what is the role of skepticism towards advertising?"

The format of the document is as follows: first, the theoretical framework will be introduced, explaining the main concepts and hypotheses of the study. In the methodology section the study design, and the process that has been established to answer the research question will be described. The results of the experiment will be presented in the results section. Ultimately, in the discussion section the research question will be answered, and its theoretical and practical implications will be discussed, including suggestions for future research.

2. Theoretical Framework

2.1 Effects of website design on consumer responses

In recent years, there has been an increasing amount of research on the effects of website design (e.g., Shankar et al., 2002; Wang & Emurian, 2005; Douglass et al., 2010). One of the first studies on the effects of website design was by Fogg et al. (2003). In this study, 2684 students were asked to give their opinion on the trustworthiness of a website. The researchers stated that 46.1% of the participants indicated that website design was an important factor. Wang and Emurian (2005) conducted research on website characteristics that increase trust on a website, finding four important dimensions: (1) graphic design dimension refers to the visual aspects of a website that give users a first impression (such as proper use of fonts and colors), (2) structure design refers to the organization of and accessibility to information on the website, (3) content design is about the graphical or textual informational components on the website, and (4) social cue design is about showing contact options in the website interface. Wang and Emurian's (2005) work is used as a framework in many other studies. For example, Karimov et al. (2011) conducted a literature review of the dimensions mentioned by Wang and Emurian (2005). Their research confirmed that the four dimensions were significant for online trust.

Several studies show that online trust has a positive relationship with purchase intention (e.g., Everard & Galletta, 2005; Chen & Barnes, 2007; Mukherjee & Nath, 2007; Choon et al., 2011; Karimov et al., 2011; Amaro & duarte, 2015). For example, the work of Everard and Galletta (2005) argues that a clear flow can be seen in the formation of purchase intention. First of all, it is stated that the perceived quality is determined by the extent to which the website is free of language errors, graphic and visual errors and incompleteness. The perceived quality then determines the degree of online trust. Finally, Everard and Galletta (2005) state that individuals

are more inclined to perform online financial transactions if trust is present. In other words, the degree to which an individual trusts a website determines purchase intention.

This is partly consistent with the work of Chen and Barnes (2007). They conducted research on the formation of purchase intentions in a Taiwanese online bookstore. Chen and Barnes (2007) concluded that perceived usefulness, perceived security, perceived good reputation and willingness to customize are predictors of online trust. In addition to online trust, familiarity is also a predictor of purchase intention according to Chen and Barnes (2007). This also overlaps with the study by Choon et al. (2011). This study, which was conducted among information technology students in Kuala Lumpur, concluded that purchase intention is the result of online trust. Furthermore, according to Choon et al. (2011), online trust is determined by perceived technology and perceived risk.

2.1.1 Graphic design dimension

The importance of high-quality graphic design is emphasized by Wang and Emurian (2005) and Karimov et al. (2011). The graphic design of a website gives visitors a first impression. It involves, for example, the use of (good) images and the correct use of colors and shades (Wang & Emurian, 2005). Karimov et al. (2011) state that the use of attractive and appropriate graphic elements give visitors more online trust. Schlosser et al. (2006) manipulated various graphic design elements in a website design to see how they affected online trust and purchase intentions. The researchers concluded that the used font, background color and use of technology communicate how much effort has been invested in the website design. For example, the use of the Times New Roman font was found to be subordinate to the Garamond font in the study. This results in less online trust and lower purchase intention. Everard and Galletta (2005) also conducted research on the influence of the graphic design feature on online trust. They

found that a website design, in which there was a poor contrast between the text on the website and the background, had a negative impact on the perceived quality of the website, and consequently on the trust in that website. These findings of this research leads to the following hypotheses:

H1a: A website with low investment in graphic design elements results in lower trustworthiness of scarcity and social proof principles.

H1b: A website with low investment in graphic design elements results in lower appreciation towards scarcity and social proof principles.

H1c: A website with low investment in graphic design elements results in lower encouragement to book.

H1d: A website with low investment in graphic design elements results in less online trust.

H1e: A website with low investment in graphic design elements results in a lower purchase intention.

H1f: A website with low investment in graphic design elements results in a higher perceived risk.

H1g: A website with low investment in graphic design elements results in a lower website evaluation.

2.1.2 Social cue design dimension

Social cue design is another important dimension investigated by Wang and Emurian (2005). Social cue design is about the presence of social cues such as face-to-face interaction and social presence (e.g., the possibility of calling a customer service representative via a chat screen during the website visit). The use of social cues in the web environment has been widely studied. For example, Ogonowski et al. (2014) studied the use of chat boxes on a webshop. The researchers used an experiment to investigate the use of social cues on a fictional photo camera webshop. On the first variant, a website design was shown without social presence. In the second variant, website visitors could contact an employee directly through a chat feature. The results of the study showed that the use of social presence features on the website had a significant positive effect on online trust. These results are consistent with a study by Lu et al. (2016), who investigated the formation of online trust on a well-known ecommerce website in China. The study by Lu et al. (2016) showed that social presence plays an important and significant role in building online trust. In addition, the researchers showed that online trust is an important antecedent of purchase intention.

Karimov et al. (2011) also emphasize the importance of social presence. They state in their research that social presence is an important 'booster' of online initial trust. Karimov et al. (2011) state that one can make use of this by implementing facial photos or videos of webshop employees, provide the visitor with an opportunity to chat directly with an employee or by posting recommendation help. This literature results in the following hypotheses:

H2a: A website with high investment in social cue elements results in higher trustworthiness of scarcity and social proof principles.

H2b: A website with high investment in social cue elements results in higher appreciation towards scarcity and social proof principles.

H2c: A website with high investment in social cue elements results in higher encouragement to book.

H2d: A website with high investment in social cue elements results in more online trust.

H2e: A website with high investment in social cue elements results in a higher purchase intention.

H2f: A website with high investment in social cue elements results in a lower perceived risk.

H2g: A website with high investment in social cue elements results in a higher website evaluation.

2.2 Effect of skepticism towards advertising

Skepticism towards advertising is defined by Obermiller and Spangenberg (1998) as "the tendency towards disbelief of advertising claims" (p. 160). Obermiller and Spangenberg (1998) argue that skepticism towards advertising can be generalized, but that a particular medium can also have a strong influence. According to Obermiller and Spangenberg (1998), consumers may be more skeptical of newspaper ads compared to radio ads, but nevertheless, these consumers are in general more skeptical of all media than consumers who are less skeptical towards advertising.

The foundations of skepticism towards advertising can be found in the persuasion knowledge framework developed by Friestad and Wright (1994). Persuasion knowledge is defined by Friestad and Wright as the ways in which consumers respond to the attempts of salespeople and advertisers to persuade consumers. The persuasion knowledge framework states

that persuasion knowledge is created by three factors that both the target and the agent possess:

(1) topic knowledge, (2) persuasion knowledge and (3) agent knowledge. These three factors create coping behaviours in the target, while the agent carries out his persuasive tactics. Obermiller and Spangenberg (1998) argue that the arguments emphasizing the importance of persuasion knowledge are the same as for skepticism towards advertising, but that persuasion knowledge is a more encompassing concept.

As yet, few studies seem to be known about skepticism towards advertising in combination with Cialdini's persuasion principles specifically. Nevertheless, Mukherjee and Lee (2016) concluded that persuasion knowledge is an important mechanism in scarcity appeals in advertising. Also, Fenko et al. (2017) conducted research on the effect of scarcity and social proof messages in the online context. The research (online experiment) concluded that a high level of persuasion knowledge causes a reduced effect of scarcity and social proof principles on time pressure, product value and purchase intention compared to low persuasion knowledge.

Consequently, this results in the following hypothesis:

H3: The effects of website design on consumer responses are more (vs. less) pronounced for people with low (high) skepticism towards advertising.

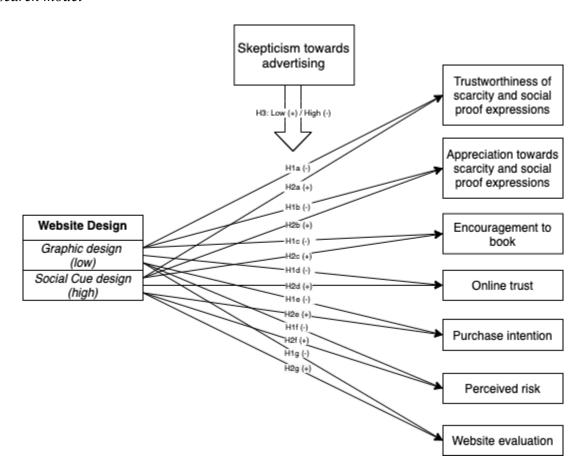
3. Methodology

3.1 Research model

To answer the research question, an experiment was conducted. Five designs were developed, three of which were used in the experiment. The research model consisted of a 3 (website design: low graphic design, control condition, social cue design) x 2 (skepticism towards advertising: high, low) design (see figure 1).

Figure 1

Research model



3.2 Stimulus materials and pre-test

To determine the extent to which manipulations in the website design were received, the designs were examined by pre-testing. The pre-test was conducted among 16 respondents who had to rate six designs: (1) low graphic design, (2) low structure design, (3) low content design, (4) high social cue design, (5) different color design and (6) control condition (see appendix A). The designs were rated by participants using five questions about how trustworthy (three questions) and attractive (two questions) the designs appeared. This was measured with a five-point Likert scale, ranging from strongly disagree to strongly agree.

The designs were based on the online trust studies of Wang and Emurian (2005), Everard and Galletta (2005), Schlosser et al. (2006) and Karimov et al. (2011). There was a neutral design (control condition, see figure 3) in which all dimensions (graphic, structure, content and social cue) were balanced. In the low graphic design (see figure 2), three manipulations were applied: font, background and contrast. Therefore, a less professional font (Times New Roman) was used, a dark gray background was placed and the contrast of the elements was reduced. This can be seen in the menu (text is hard to read because of color) and in the other text elements (a striped background has been used to make the text hard to read). In the low structure design (see appendix A), two manipulations were applied: incompleteness and navigation. A page is presented with incomplete information (for example, a photo is missing), and the menu consists of incomplete and irrelevant items. In the low content design (see appendix A), two manipulations were applied: all company information and customer service information is missing. In the high social cue design (see figure 4), contact with the organization is actively encouraged. In this design there are many social buttons, a live chat employee who can help

directly and clear contact information is presented. In the color design (see appendix A), colors are applied that match more with the other elements of the website.

To determine which design scored the highest (and lowest) the means were compared. First, the means of trustworthiness (three questions) were examined. The two highest scoring designs were the high social cue design (M = 4.25, SD = .75) and the control condition (M = 4.02, SD = .67). The lowest score was achieved by the low graphic design (M = 2.85, SD = 1.05). The scores that stayed in the middle were those of low structure design (M = 3.54, SD = .93), low content design (M = 3.60, SD = .80) and color design (M = 3.56, SD = .76). Of the three designs that scored in the middle (low structure design, low content design and color design), the means of attractiveness (two questions) were also analyzed to see if it produced different results. It resulted in higher means for low structure design, low content design, and color design, but the ranking of the different designs remained the same.

Based on the results of the pre-test, it was decided to proceed with the two highest scoring (control condition and high social cue) and the lowest scoring (low graphic) designs. In figure 2, 3 and 4 the different designs are presented.

Figure 2

Low graphic design

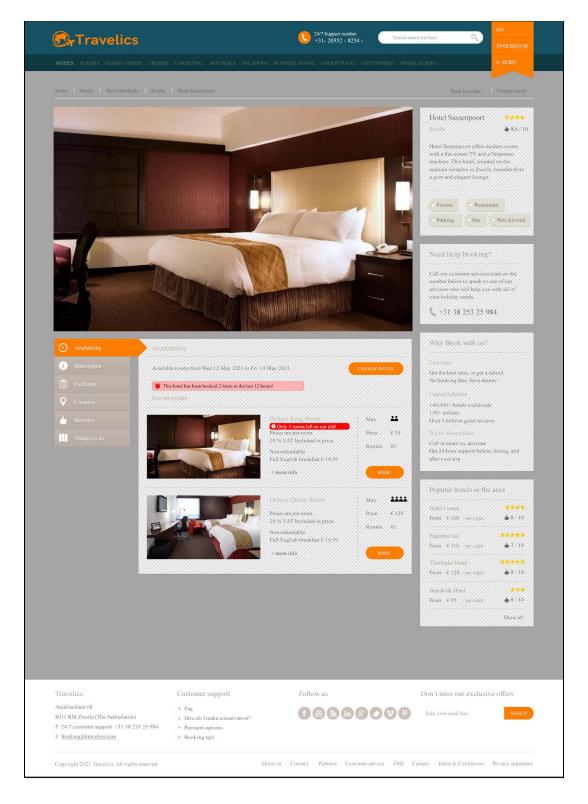


Figure 3

Control condition

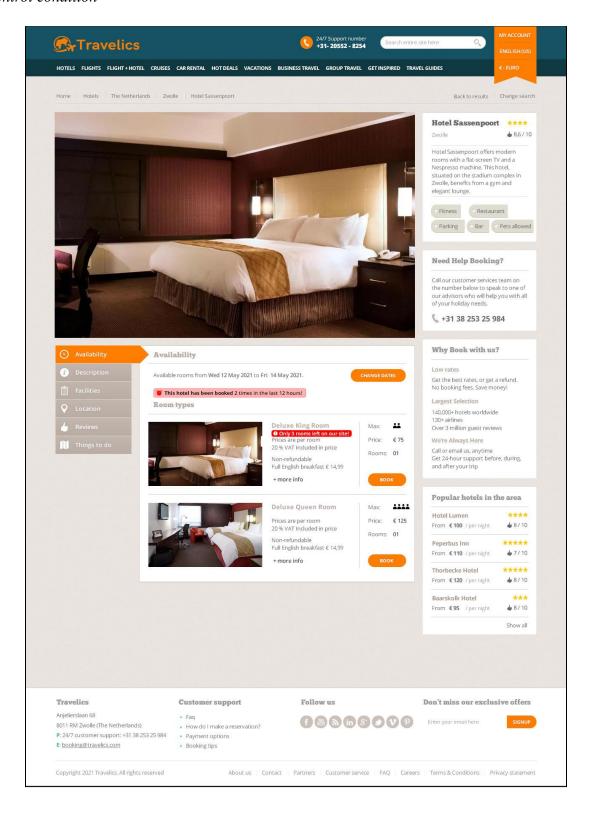
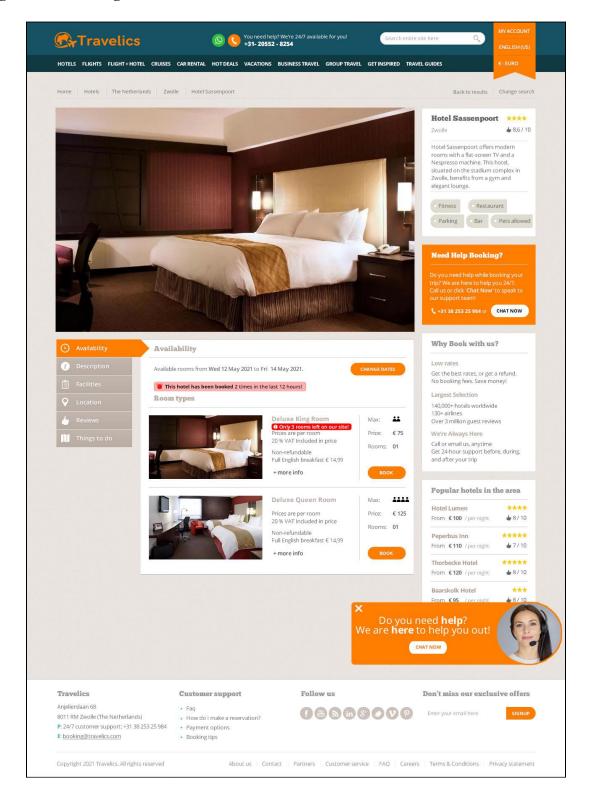


Figure 4

High social cue design



3.3 Participants

A total of 202 usable participants participated in the study. There was a total of 278 participants, but 76 respondents had not completed the questionnaire and were excluded. The age of the participants ranged from 17 to 77 years old, with the mean age being 30.3 (SD = 11.3) years old. The largest group of participants was between 25 and 34 years old. There was also an almost even distribution of gender, and the largest group had a bachelor's degree. Table 1 shows the characteristics of the participants per condition.

Table 1Characteristics of participants per condition

	High Social Cue design	Low Graphic design	Control condition	Total
Website Design	(n=71)	(n=63)	(n=68)	(N=202)
Gender				
Male	32 (45.1%)	29 (46.0%)	40 (58.8%)	101 (50.0%)
Female	39 (54.9%)	33 (52.4%)	27 (39.7%)	99 (49.0%)
Other	0 (0.0%)	1 (1.6%)	1 (1.5%)	2 (1.0%)
Education level				
High school	8 (11.3%)	6 (9.5%)	8 (11.8%)	22 (10.9%)
Bachelor's degree	45 (63.4%)	44 (69.8%)	42 (61.8%)	131 (64.9%)
Master's degree	17 (23.9%)	11 (17.5%)	12 (17.8%)	40 (19.8%)
PhD or higher	0 (0.0%)	0 (0.0%)	1 (1.5%)	1 (0.5%)
No degree	1 (1.4%)	1 (1.6%)	3 (4.4%)	5 (2.5%)
Other	0 (0.0%)	1 (1.6%)	2 (2.9%)	3 (1.5%)
	M = 32	M = 29.76	M = 29.12	M = 30.33
Age	SD = 13.26	SD = 9.92	SD = 10.28	SD = 11.3
Skepticism toward advertising				
Low	31 (43.7%)	31 (49.2%)	36 (52.9%)	98 (48.5%)
High	40 (56.3%)	32 (50.8%)	32 (47.1%)	104 (51.5%)

3.4 Procedure

The between-subjects experiment was designed and conducted using a dedicated survey tool (Qualtrics). A brief introduction and briefing was presented on the first page of the experiment. The subsequent page asked for demographic data (age, gender, highest level of education). After these data were collected, an additional briefing was presented. It stated that the participant should imagine that he or she wanted to book a city trip to Zwolle and ended up on the hotel page (which was presented on the next page of the questionnaire). The participant was asked to read the page as carefully as possible and answer the questions.

In the first part of the questionnaire, the complete website design was presented. Then questions were asked about website evaluation, purchase intention, online trust and perceived risks. Next, there was a screenshot with focus on the scarcity and social proof principles. After that, questions were asked about the trustworthiness and appreciation towards the scarcity and social proof principles. Finally, the encouragement to book was asked in this section. In the last section of the questionnaire, questions were asked about skepticism towards advertising.

To get the desired number of participants, convenience sampling was used. Convenience sampling is a way of non-probability sampling using people available for the research (Babbie, 2014). The experiment was shared on Facebook and LinkedIn. This included a requirement that the experiment must be completed on a computer, as the screenshots were designed for desktop use.

3.5 Measures

3.5.1 Dependent measures

Trustworthiness of scarcity and social proof principles. To measure trustworthiness of scarcity and social proof principles, three items derived from Boush et al. (1994) were used: (1) I

trust these principles, (2) I think the information in the principles correspond to the truth and (3) I think the website uses these principles as a sales technique. This was measured using a five-point Likert scale ranging from strongly disagree to strongly agree. The reliability was initially $\alpha =$.662. After removing the statement, "I think the website uses these principles as a sales technique" the reliability went to $\alpha = .943$. However, Eisinga et al. (2013) state that Cronbach's Alpha is not reliable for measuring a two-item scale. The author states that Spearman's Brown coefficient is most suitable for two-item measures. Spearman's Brown showed the measure to be reliable ($\rho = .943$).

Appreciation towards scarcity and social proof principles. To measure appreciation towards scarcity and social proof principles, three items derived from Boush et al. (1994) were used: (1) I like the fact that I get this warning, (2) these principles grab my attention and (3) I like the fact that the organization places these principles. This was measured using a five-point Likert scale ranging from strongly agree to strongly disagree. The construct proved reliable (α = .840).

Encouragement to book. To measure encouragement to book, the following three items derived from Boush et al. (1994) were presented: (1) It encourages me to book a hotel room, (2) I feel I should hurry up with booking the hotel room and (3) I will not book the hotel through this website. This was measured with a five-point Likert scale, ranging from strongly disagree to strongly agree. The reliability was initially $\alpha = .062$. After removing the statement, "I will not book the hotel through this website" the reliability increased to $\alpha = .842$. Because we are dealing with a two-item scale, Spearman's Brown was used to measure reliability (Eisinga et al., 2013). This showed reliability ($\rho = .843$).

Online trust. Online trust was measured using four items, derived from Corritore et al. (2005) and Choon Ling et al. (2011). The following statements were presented: (1) this website provides truthful information, (2) the website contents are in line with what you would expect from a hotel booking site, (3) I believe this website will not act in a way that harms me and (4) I believe this website is trustworthy. Cronbach's Alpha showed the reliability of the construct ($\alpha = .866$).

Purchase intention. Purchase intention was measured using four items, derived from Choon Ling et al. (2011) and Chen and Teng (2013). The following statements were presented to the participants: (1) I am positive towards booking a hotel room on this website, (2) The thought of booking a hotel room on this website is appealing to me, (3) I think it is a good idea to book a hotel room on this website and (4) Given the chance, I would consider using this website to book a hotel room. Cronbach's Alpha showed the reliability of the construct ($\alpha = .918$).

Perceived risk. Perceived risk was measured using three items, derived from Chan and Lu (2004). The following statements were presented: (1) I do not perceive any risk by sharing my personal information with this website, (2) I am confident that others can not tamper with information concerning a transaction with this website and (3) I don't feel that there is a risk of losing money when booking via this website. Cronbach's Alpha showed the reliability of the construct ($\alpha = .894$).

Website evaluation. To measure website evaluation, four items were used. These were rated on a five-point Likert scale, ranging from strongly disagree to strongly agree. It involved the following statements: (1) this website looks attractive to me, (2) I would recommend this website to my family and friends, (3) this website presents all the information I need and (4) this website comes across as professional. The construct proved to be reliable ($\alpha = .835$).

3.5.2 Moderator

Skepticism towards advertising. This was measured with three items derived from Obermiller and Spangenberg's (1998) skepticism towards advertising scale: (1) we can assume that scarcity and social proof principles on online travel agent websites are used to help visitors, (2) the purpose of scarcity and social proof principles on online travel agent websites is to inform visitors and (3) with scarcity and social proof principles on online travel agent websites, you get a true picture of the quality of a hotel. The Cronbach's Alpha demonstrates good reliability (α = .896). A median split was applied on the mean score to divide the participants into low skepticism towards advertising on the one hand, and high skepticism towards advertising on the other.

4. Results

This section presents the results of the study. An analysis of variances was conducted to examine whether website design has an effect on the dependent variables. It was also examined whether skepticism toward advertising shows an (interaction) effect on the various dependent variables. Table 2 shows the summarized descriptive data of the variables.

 Table 2

 Descriptive analysis of dependent variables

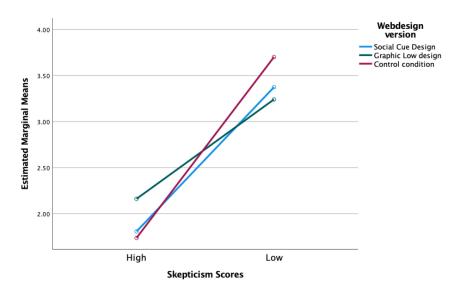
Measures Low graphic design						Control condition							High social cue design					
	Skepticism towards advertising				ng	Skepticism towards advertising					Skepticism towards advertising							
	High		Low		Total		High		Low		Total		High		Low		Total	
	\overline{M}	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Trustworthiness of principles	2.16	1.09	3.24	1.59	2.70	1.45	1.73	0.85	3.70	1.12	2.66	1.39	1.80	0.77	3.37	1.20	2.69	1.29
Appreciation of principles	2.92	1.23	3.53	1.16	3.23	1.22	2.42	0.75	3.99	0.84	3.16	1.12	2.25	0.95	3.93	0.87	3.19	1.23
Encouragement to book	2.79	1.35	3.71	1.31	3.25	1.40	2.44	1.01	3.75	0.98	3.06	1.19	2.68	1.16	3.71	0.91	3.26	1.14
Online trust	3.57	0.67	4.23	0.62	3.90	0.72	3.72	0.79	4.30	0.48	3.99	0.72	3.52	0.97	4.27	0.59	3.94	0.86
Purchase intention	3.41	0.99	4.16	0.84	3.79	0.98	3.74	0.69	4.07	0.84	3.89	0.77	3.35	1.00	4.23	0.60	3.85	0.90
Perceived risk	3.01	0.89	3.78	1.07	3.40	1.05	2.97	0.93	4.02	0.72	3.47	0.98	3.05	0.95	3.99	0.81	3.58	0.99
Website evaluation	3.45	0.90	4.17	0.75	3.81	0.90	3.70	0.74	4.06	0.75	3.87	0.76	3.50	0.95	4.15	0.65	3.87	0.85

4.1 Trustworthiness of scarcity and social proof principles

The first variable analyzed was trustworthiness of scarcity and social proof principles. The results show that there was no main effect (F(2, 195) = .26, p = .77) of website design on the trustworthiness of scarcity and social proof principles. There was no significant difference between the low graphic design (M = 2.70, SD = 1.45), the control condition (M = 2.66, SD =1.39) and the high social cue design (M = 2.69, SD = 1.29). In other words, participants experienced no significant difference in the degree of trustworthiness of scarcity and social proof principles on the different web designs. However, a significant main effect (F(2, 195) = 91.74, p< .001) of skepticism towards advertising was found. The data showed that participants who scored high on skepticism towards advertising scored lower on trustworthiness of scarcity and social proof principles (M = 1.89, SD = .92) than participants who scored low on skepticism towards advertising (M = 3.44, SD = 1.31). Also, there was a marginally significant interaction effect (F(2, 195) = 2.48, p = .09). A follow-up analysis (figure 5) shows that trustworthiness of scarcity and social proof principles in the low graphic design scores lower than the control condition and the high social cue design when the participants were less skeptical towards advertising, while the low graphic design scores highest when the participants scored high on skepticism towards advertising. Also, participants who scored high on skepticism towards advertising had the least trustworthiness in scarcity and social proof principles on the control condition, while participants who scored low on skepticism towards advertising had the most trustworthiness of scarcity and social proof principles on this control condition.

Figure 5

Interaction between website design and skepticism towards advertising on trustworthiness of scarcity and social proof principles



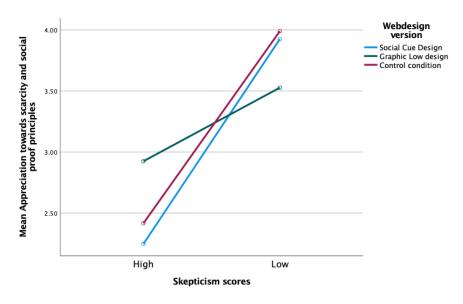
4.2 Appreciation towards scarcity and social proof principles

The analysis also showed that there was no main effect (F(2, 195) = .40, p = .67) of the different website designs on the appreciation towards the scarcity and social proof principles. There was no significant difference between the low graphic design (M = 3.22, SD = 1.22), the control condition (M = 3.15, SD = 1.12) and the high social cue design (M = 3.19, SD = 1.23). Thus, participants did not appreciate the scarcity and social proof principles more or less in the different designs. However, there was a significant main effect (F(2, 195) = 86.92, p < .001) of skepticism towards advertising. Participants who scored high on skepticism towards advertising were less appreciative (M = 2.52, SD = 1.02) than those who scored low on skepticism towards advertising (M = 3.82, SD = .97). Also, the analysis shows that a significant interaction effect (F(2, 195) = 5.98, p = .003) can be found for website design and skepticism towards advertising. Follow-up analysis (figure 6) shows that the low graphic design scores the lowest when one is

highly skeptical towards advertising. In other words, participants who scored high on skepticism towards advertising have the most appreciation towards scarcity and social proof principles in the low graphic design, while the participants who scored low on skepticism towards advertising have the least appreciation towards scarcity and social proof principles in the low graphic design.

Figure 6

Interaction between website design and skepticism towards advertising on appreciation towards scarcity and social proof principles



4.3 Encouragement to book

The analysis shows that there is no significant main effect (F(2, 195) = .31, p = .73) of website design on encouragement to book. There was no significant difference between the low graphic design (M = 3.25, SD = 1.40), the control condition (M = 3.06, SD = 1.19) and the high social cue design (M = 3.26, SD = 1.14). Participants were not encouraged to book more quickly in a particular web design. However, the analysis does show that there is a main effect (F(2, 195) = 46.90, P < .001) of skepticism towards advertising. Participants who scored high on skepticism towards advertising were less encouraged to book (M = 2.63, SD = 1.17) than participants who

scored low on skepticism towards advertising (M = 3.72, SD = 1.06). Finally, the study shows that there is no significant interaction effect (F(2, 195) = .52, p = .60) of website design and skepticism towards advertising.

4.4 Online trust

There was no effect (F(2, 195) = .58, p = .56) of the different website designs on online trust. There was no significant difference between the low graphic design (M = 3.90, SD = .72), the control condition (M = 3.99, SD = .72) and the high social cue design (M = 3.94, SD = .86). Contrary to expectations, participants did not indicate that they had significant more online trust in the control condition or the high social cue design. However, there was a significant main effect (F(2, 195) = 44.53, p < .001) of skepticism towards advertising. Participants who scored high on skepticism towards advertising, had less online trust (M = 3.61, SD = .81) than participants who scored low on skepticism towards advertising (M = 4.27, SD = .56). However, there was no significant interaction effect (F(2, 195) = .21, p = .81) of website design and skepticism towards advertising on online trust.

4.5 Purchase intention

The analysis shows no significance (F(2, 195) = .44, p = .65) between website design and purchase intention. There was no significant difference between low graphic design (M = 3.79, SD = .98), the control condition (M = 3.89, SD = .77) and the high social cue design (M = 3.85, SD = .90). Contrary to expectations, there was no significant difference in purchase intention. However, the analysis showed that there was a significant main effect (F(2, 195) = 31.04, p < .001) of skepticism towards advertising. Participants who scored high on skepticism towards advertising, had a lower purchase intention (M = 3.51, SD = .90) than participants who scored low on skepticism towards advertising (M = 4.15, SD = .74). Finally, there appeared to be no

interaction (F(2, 195) = 3.98, p = .14) between website design and skepticism towards advertising on purchase intention. In other words, the purchase intention was not significantly different for the combination of website design and skepticism towards advertising.

4.6 Perceived risks

Perceived risk was also analyzed in the study. Website design does not show a main effect (F(2, 195) = .35, p = .71) on perceived risk. There was no significant difference between low graphic design (M = 3.40, SD = 1.05), the control condition (M = 3.47, SD = .98) and the high social cue design (M = 3.58, SD = .99). This was also against the odds. There was no significant difference in perceived risk, although this was expected. However, there was a significant main effect (F(2, 195) = 52.25, p < .001) of skepticism towards advertising. Participants who scored high on skepticism towards advertising, experienced less perceived risk (M = 3.01, SD = .92) than participants who scored low on skepticism towards advertising (M = 3.93, SD = .87). However, no significant interaction effect (F(2, 195) = .38, p = .68) was found between website design and skepticism toward advertising on perceived risks.

4.7 Website evaluation

The anova analysis showed, contrary to expectations, that there was no significant (F(2, 195) = .15, p = .86) main effect of website design on website evaluation. This means that there was no significant effect of low graphic design (M = 3.81, SD = .90), the control condition (M = 3.87, SD = .76) and the high social cue design (M = 3.87, SD = .85). Participants therefore did not rate the website better or worse in the different designs. However, in website evaluation there was a significant main effect (F(2, 195) = 26.49, p < .001) of skepticism towards advertising. Participants who scored high on skepticism towards advertising, showed a lower website evaluation (M = 3.56, SD = .86) than participants who scored low on skepticism towards

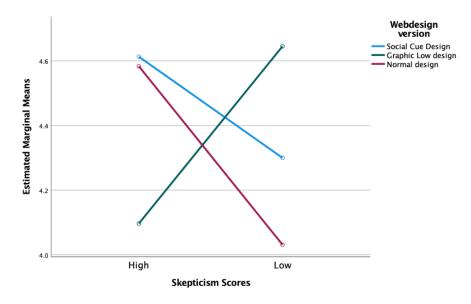
advertising (M = 4.12, SD = .71). Finally, there was no interaction (F(2, 195) = .95, p = .39) between website design and skepticism towards advertising on website evaluation.

4.8 Perceived use of sales techniques

Website design did not appear to have a significant effect (F(2, 195) = .41, p = .66) on the perceived use of sales techniques. There was no significant difference between low graphic design (M = 4.37, SD = 1.19), the control condition (M = 4.32, SD = .94) and the high social cue design (M = 4.44, SD = .84). Also, there was no main effect from skepticism towards advertising (F(2, 195) = .59, p = .44). Participants who had high skepticism towards advertising, did not perceive the use of scarcity and social proof principles significantly more as a sales technique (M = 4.44, SD = 1.05) than participants who had low skepticism towards advertising (M = 4.32, SD = .94). However, there was a significant interaction effect (F(2, 195) = 5.71, p = .004) from people with high or low skepticism towards advertising (figure 7). Participants who scored high on skepticism towards advertising saw the low graphic design less as a sales technique. While participants who had low skepticism towards advertising, saw the low graphic design significantly more as a sales technique.

Figure 7

Interaction between website design and skepticism towards advertising on perceived use of a sales technique



4.9 Overview hypotheses

Taking into account the previously mentioned results in this chapter, Table 3 shows to what extent the results are supported or rejected.

Table 3Overview of tested hypotheses

Hypothesis	Content	Result
H1a	A website with low investment in graphic design elements results in lower trustworthiness of scarcity and social proof principles.	Rejected
H1b	A website with low investment in graphic design elements results in lower appreciation towards scarcity and social proof principles.	Rejected
H1c	A website with low investment in graphic design elements results in lower encouragement to book.	Rejected
H1d	A website with low investment in graphic design elements results in less online trust.	Rejected
H1e	A website with low investment in graphic design elements results in a lower purchase intention.	Rejected
H1f	A website with low investment in graphic design elements results in a higher perceived risk.	Rejected
Hlg	A website with low investment in graphic design elements results in a lower website evaluation.	Rejected
H2a	A website with high investment in social cue elements results in higher trustworthiness of scarcity and social proof principles.	Rejected
H2b	A website with high investment in social cue elements results in higher appreciation towards scarcity and social proof principles.	Rejected
Н2с	A website with high investment in social cue elements results in higher encouragement to book.	Rejected
H2d	A website with high investment in social cue elements results in more online trust.	Rejected
H2e	A website with high investment in social cue elements results in a higher purchase intention.	Rejected
H2f	A website with high investment in social cue elements results in a lower perceived risk.	Rejected
H2g	A website with high investment in social cue elements results in a higher website evaluation.	Rejected
Н3	The effects of website design on consumer responses are more (vs. less) pronounced for people with low (high) skepticism towards advertising.	Partially supported*

^{*}The results showed an interaction effect of website design and skepticism towards advertising for: (1) trustworthiness and (2) appreciation towards scarcity and social proof principles and (3) perceived use of sales techniques

5. Discussion

This chapter discusses the results. It reflects on the existing literature and looks at theoretical and practical implications. Limitations of the study and suggestions for future research are also discussed. The discussion ends with an overall conclusion.

5.1 Discussion of findings

The aim of this study was to investigate whether website design has an effect on the trustworthiness of scarcity and social proof principles, and what the role of skepticism towards advertising is. The reported findings of the study demonstrate the importance of skepticism towards advertising in the relationship between website design and (1) trustworthiness and (2) appreciation of scarcity and social proof principles in the context of online travel agent websites. Also, skepticism towards advertising plays an important role in the relationship between website design and perceived use of sales techniques. As discussed in the results section, the interaction effects showed that participants with high skepticism towards advertising experienced the most trustworthiness (and appreciation) of scarcity and social proof principles with the low graphic design, while participants with low skepticism towards advertising experienced the least trustworthiness (and appreciation) of scarcity and social proof principles with the low graphic design. This effect was also reflected in the 'perceived use of sales technique' measure. This is in contrast with findings about online trust from Wang and Emurian (2005), Everard en Galletta (2005) and Schlosser et al. (2006), who would suggest that the low graphic design would score lower than the other website designs.

A possible explanation for these results could be found in the persuasion knowledge model of Friestad and Wright (1994), on which skepticism towards advertising by Obermiller and Spangenberg (1998) is based. The persuasion knowledge model states that persuasion

knowledge is based on (1) topic knowledge, (2) persuasion knowledge and (3) agent/target knowledge of both the target (the consumer) and the agent (the website). The web design could cause a distortion of agent- and persuasion knowledge. After all, a non-professional website design (or, in the case of this experiment, a low graphic design) could give the impression of poor technical knowledge, but also of poor persuasion knowledge. Visitors might get the impression that the scarcity and social proof principles are used to really indicate how many rooms are still available and how often a particular hotel room has been booked, rather than being used as a means of persuasion. According to the model, a participant with little skepticism towards advertising has less persuasion knowledge. It is likely that the participant with low skepticism towards advertising will focus mainly on the visual aspects of the web design, but will not think not about the persuasion intentions of the website. As a result, the participant only judges on the basis of the website design, which is less attractive with a low graphic design. This could also explain why the high social cue design scores low with high skepticism towards advertising. An increased level of skepticism towards advertising could mean that participants in the high social cue design recognize the agent (website) as professional and capable, which enables them to purposefully use scarcity and social proof principles to persuade them.

The results also showed that skepticism towards advertising (Obermiller & Spangenberg, 1998) had a main effect on (1) trustworthiness and (2) appreciation of scarcity and social proof principles, (3) encouragement to book, (4) online trust, (5) purchase intention, (6) perceived risk and (7) website evaluation. This is in line with the expectation of Obermiller and Spangenberg (1998) that skepticism towards advertisements can be generalized across all media.

5.2 Limitations

Although this study has provided some insights into the relationship between website design, skepticism towards advertising and trustworthiness of scarcity and social proof principles, there are also some limitations to the research. First, the research was carried out in a fictitious environment, on a fake page that could only be viewed (not clickable). Screenshots of different website designs were presented, and therefore participants could not interact with the designs. In addition, it cannot be determined whether the participants were looking for a city trip to Zwolle at the time of participation. In a real situation, the results could therefore be different.

The second limitation of the study is that convenience sampling (snowball sampling) was used. The participants in the study were collected by means of social media, whereby the participants were asked whether the questionnaire could be distributed further. As a result, it may cause problems for the generalizability of the results.

Finally, in two measures, items were removed because they lowered the realism. Because of this, the measures had to be measured with two items. A possible explanation why the items decreased the reliability was the fact that they had to be answered "reversed". In the case of "trustworthiness of principles" the first question was: "I trust these principles", the second question was: "I think the information in the principles correspond to the truth" and the last question was: "I think the website uses these principles as a sales technique". The participant may have had the intuitive feeling that the last question should also be answered as "positive", which may have made this item inaccurate.

5.3 Future research

There are a number of recommendations when it comes to future research. First of all, it may be interesting to repeat this experiment in a more interactive setting, where participants have the possibility to actively browse through a website. This may give participants an increased sense of being in a real scenario, and an increased feeling that they are actually looking for a hotel.

Another recommendation when it comes to future research is to test the other design dimensions of Wang and Emurian (2005). Based on the pre-test results in this study, it was decided to continue with the graphic design dimension and the social cue design dimension. However, structure design and content design were not considered in this study. The role of (high/low) structure and content design on the trustworthiness of scarcity and social proof could lead to different conclusions and results. On the other hand, future research can also investigate the effect of the design dimensions of Wang and Emurian (2005) on the other principles of Cialdini (2007). In this research, the choice was made to investigate the scarcity and social proof principles, but Cialdini (2007) came up with five more principles: (1) reciprocity, (2) authority, (3) commitment and consistency, (4) liking and (5) unity. The effect of the graphic, content, structure and social cue design dimensions on the trustworthiness of reciprocity, authority, commitment and consistency, liking and unity principles can be examined. This can be examined in the same setting as this study, but also in a more interactive setting (as mentioned earlier). A more interactive study could simulate a realistic situation, which could make the results of the study even more reliable.

Another logical follow-up research is to look at the relationship between *trustworthiness* of scarcity and social proof principles and *effectiveness* of scarcity and social proof principles. In

the work of Thaler and Sunstein (2017), it is argued that the use of persuasion tactics (also called 'nudges' by Thaler and Sunstein) is based on rules of thumb, which means that our decisions are not always rational but rather intuitive. It may then be interesting for follow-up research to study whether consumers (despite not 'believing' a scarcity or social proof statement) still allow themselves to be tempted to book a hotel room. This could be examined with an experiment, in which the participants are first asked about the trustworthiness of persuasion principles. Subsequently, the study could examine to what extent the participants choose a hotel room with persuasion principles and without persuasion principles.

Finally, it may be interesting to study to what extent brand awareness can play a role in the trustworthiness of scarcity and social proof principles. Persuasion knowledge has been an important part of this research. As Friestad and Wright (1994) described, persuasion knowledge consists of (1) topic knowledge, (2) persuasion knowledge and (3) agent knowledge. This study showed that almost half of the participants scored high on skepticism towards advertising (which is the result of persuasion knowledge). Many participants are therefore aware of the use of persuasion tactics by online travel agents. Based on this, it can be examined whether the trustworthiness of scarcity and social proof principles is higher on unfamiliar online travel agent websites than established online travel agent websites (such as Booking.com and Expedia.com). After all, in recent years there has been media attention on the use of persuasion tactics by large online travel agents. This research could be carried out by replicating websites of well-known (and unknown) online travel agents, and by analysing to what extent participants question the trustworthiness of persuasion principles.

5.4 Implications

A number of practical and theoretical implications can be identified. This research contributes to the study of the trustworthiness of persuasion principles, a topic that has so far received little attention in the literature. It shows that trustworthiness of scarcity and social proof principles are influenced by website design, but only if skepticism towards advertising is also taken into account. Also, this research contributes to the research on persuasion principles on online travel agent websites. After all, these are widely used on online travel agent websites (Fenko et al., 2017). Another theoretical implication that this research contributes to is the research on skepticism towards advertising. There are a number of studies on skepticism towards advertising, but few in the context of websites. Many studies focus mainly on persuasion knowledge, but this study shows that skepticism towards advertising can have an influential role as well.

In terms of practical implications, this study contributes to the web development industry. When applying scarcity and social proof principles, web developers and internet entrepreneurs (especially in the travel industry) should be aware that there is another important factor besides web design: skepticism towards advertising. The scarcity and social proof principles were most trusted in the low graphic design with the group with high skepticism towards advertising, while this low graphic design scored lowest with the participants with low skepticism towards advertising. Web developers and internet entrepreneurs should be aware that scarcity and social proof statements are not blindly believed by visitors, despite a strong web design.

5.5 Conclusion

In the past, it has been shown that web design plays an important role in the development of online trust. Various web design dimensions (e.g., graphic design, structure design, content

design and social cue design) play a role in establishing online trust. This study investigated whether (low) graphic design and (high) social cue design also have an impact on trustworthiness of scarcity and social proof principles, which are often used on online travel agent websites. The role of skepticism towards advertising was also examined.

The research shows that website design can play a role in the trustworthiness of scarcity and social proof principles, but only when skepticism towards advertising is also taken into account. In conclusion, it shows practitioners and academics that when developing and researching persuasion principles for websites, one should not only focus on website design, but also take skepticism towards advertising seriously.

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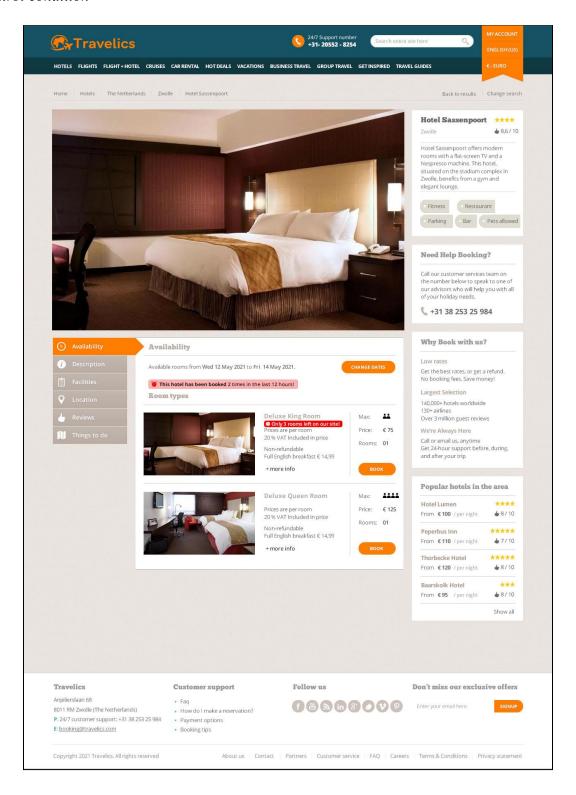
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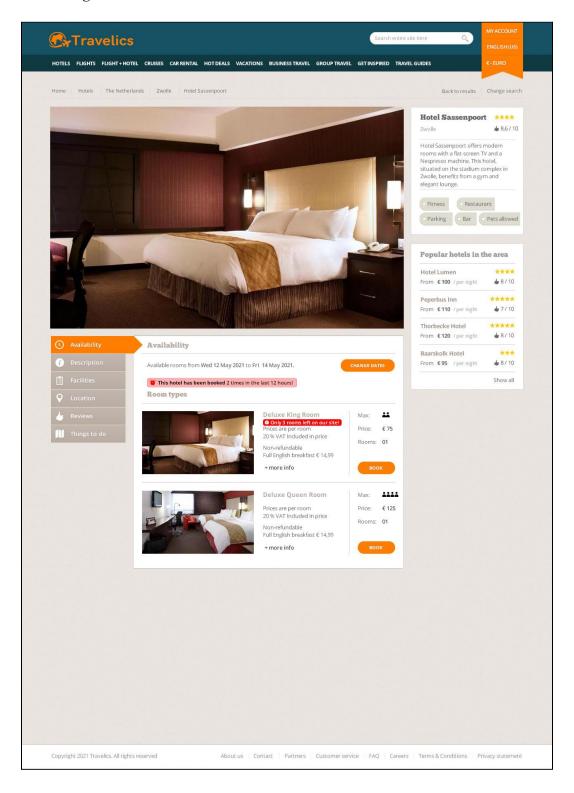
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Appendix A: Pre-test stimuli

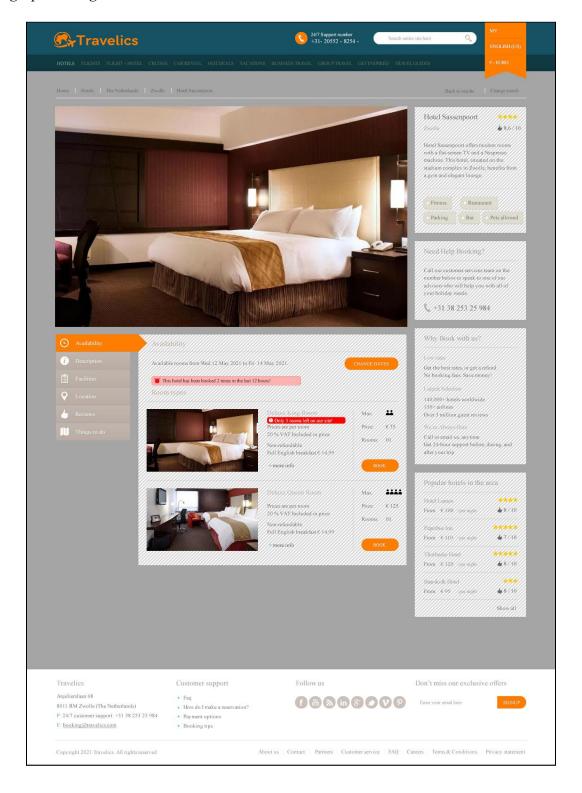
Control condition



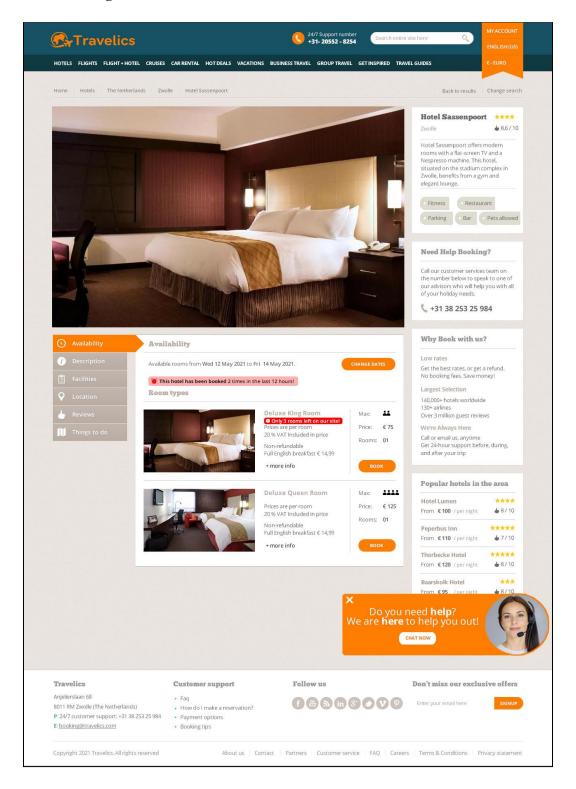
Low content design



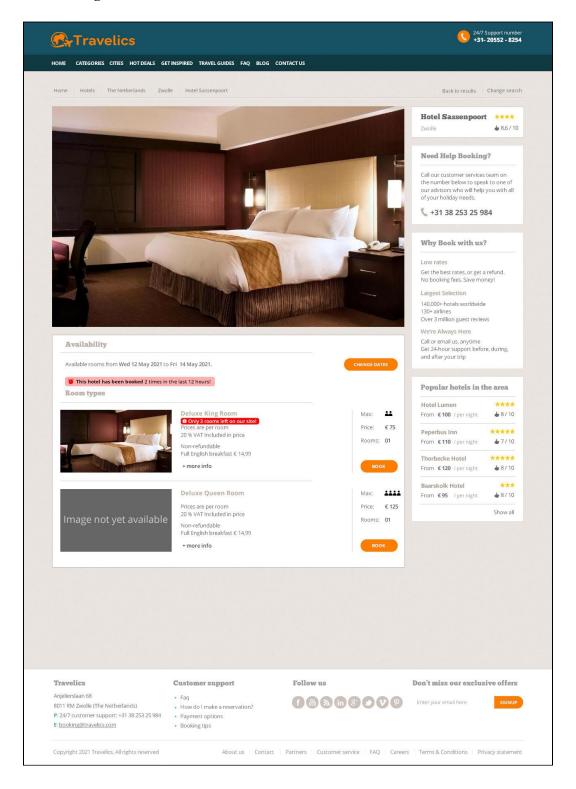
Low graphic design



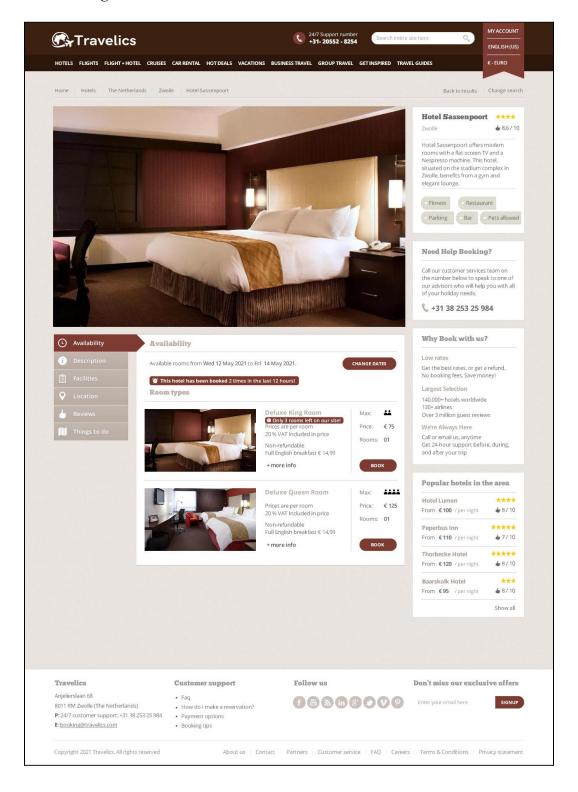
High social cue design



Low structure design



Different color design



Appendix B: Dependent measures

Table B1Dependent measures and item

Dependent variable	Items	Based on literature
Website evaluation	"This website looks attractive to me."	
	"I would recommend this website to my family and friends."	
	"This website presents all the information I need."	
	"This website comes across as professional."	
Purchase intention	"I am positive towards booking a hotel room on this website."	
	"The thought of booking a hotel room on this website is appealing to me."	Choon Ling et al. (2011) /
	"I think it is a good idea to book a hotel room on this website."	Chen & Teng (2013)
	"Given the chance, I would consider using this website to book a hotel room."	
Perceived risks	"I do not perceive any risk by sharing my personal information with this website."	
	"I am confident that others can not tamper with information concerning a transaction with this website."	Chan & Lu (2004)
	"I don't feel that there is a risk of losing money when booking via this website."	
Online trust	"This website provides truthful information."	Corritore et al. (2005) / Choon Ling et al. (2011)

"The website contents are in line with what you would expect from a hotel booking site." "I believe this website will not act in a way that harms me." "I believe this website is trustworthy." Appreciation towards scarcity and social proof "I like the fact that I get these principles warnings." Boush, Friestad & Rose "These expressions grab my (1994)attention." "I like the fact that this organization places these expressions." Trustworthiness of scarcity and social proof principles "I trust these expressions." "I think the information in the Boush, Friestad & Rose expressions correspond to the truth." (1994) "I think the website uses these expressions as a sales technique." "It encourages me to book a hotel room." Encouragement to book "I feel I should hurry up with Boush, Friestad & Rose booking the hotel room." (1994)"I will not book the hotel through this website." "We can assume that scarcity and social proof expressions on online travel agent websites are used to Skepticism towards advertising help visitors." "The purpose of scarcity and social Obermiller & Spangenberg proof expressions on online travel (1998)agent websites is to inform visitors." "With scarcity and social proof expressions on online travel agent websites, you get a true picture of

the quality of a hotel."