MAKING THE TIME SHORTER:
How Temporal and Distractor Cues Affect the Perceived Waiting Time in Online Environment

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Abstract

In last years, there is a tendency among consumers to order food online. Subsequently, the food will be delivered to the consumers' place of choice. As a result, buyers are confronted with a waiting process in the online environment. Therefore, it is important for restaurants and delivery services to improve their online waiting experience for their customers. One of the most effective strategies to do this is to present users different forms of temporal- and distractor cues on the webpage. These can make waiting experiences more enjoyable and reduce the perception of waiting time.

Consequently, a laboratory experiment of 243 participants was set up, with a purpose to examine whether the different types of temporal- and distractor stimuli materials on webpages influence customers' waiting experience. Temporal- (i.e., progress bar) and distractor (i.e., animated graphics) information were combined on the website loading page to investigate whether they affect the users' waiting experience and general opinion about the website quality. A '3x3 between-subject' design was used to examine the influence of temporal and distractor materials on customers' waiting experience factors ('perceived quality', 'focused immersion', 'temporal dissociation', 'heightened enjoyment', 'perceived waiting time', 'user satisfaction', and intention to use the website').

By adopting attentional gate model and cognitive absorption theory, it was investigated how progress bar and animation affect the study dependent variables. It was found that two types of cues reduced the perceived waiting time. Furthermore, temporal materials decreased perceived uncertainty about the wait, and distractors shifted the participants' attention from the wait, induced temporal dissociation and increased enjoyment from the wait. Moreover, it was examined that progress bar and animation enhanced user satisfaction and intention to use the website again. Finally, an interaction effect of the progress bar and animation for perceived uncertainty and focused immersion was observed.

The findings of the current research suggest that displaying a progress bar to customers, when they are waiting online for their delivery to arrive, helps individuals to estimate more precisely the amount of time they need to wait. Besides they feel more confident about the waiting process. At the same time, the animated graphics positively influence the customer emotional state, making waiting more enjoyable. Overall, the study results provide strong support of the proposed theoretical model and underline the importance for e-commerce and web-developers to investigate their efforts in designing temporal- and distractor website

elements to influence users' online waiting process and stimulate positive overall user satisfaction.

Keywords: online waiting, perceived waiting time, user satisfaction, temporal information, distractor cues, progress bars, animated visuals, attentional gate model.

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Enjoy reading!

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1. Introduction

Waiting time, as one of the indivisible elements of the humans' shopping activities, directly influences consumers' evaluation of the service quality and the satisfaction from the interaction with a company (Hirshman, 1987). Nowadays, with technological developments and the sharp increase of the e-commerce, consumers, when ordering products on the internet, more often experience moments of waiting in the online environment. However, even despite the sharp development of the internet mechanisms, customers' online waiting for the service still faces a lot of challenges and obstacles (Rose et al. 2005). In most cases, waiting online is an essential part of the e-commerce service. Thus when the waiting experience is negative, it can often lead to disappointment about the service quality and negative attitude to the product (Rose, 2005; Zhou & Soman, 2008).

Especially for delivery industries it is important to improve online time-management. The reason for this is the reshaping of their customer approach through moving more and more from the offline to the online environment. It is especially the case for the restaurants, which allow their customers to order food and drinks online through their websites. Customers, who are waiting for the delivery of their online ordered food, have a different set of requirements and expectations about the waiting process. It was stated, that people, who are waiting online are even more sensitive and short-tempered to waiting time than individuals that buy offline (Nah, 2004). Consequently, it is essential for food companies to use novel digital technologies with a purpose to improve the customers' online waiting experience, making clients to estimate waiting time shorter and making the overall waiting process more joy able.

An excellent example of improving the online waiting experience is Domino's Pizza's GPS Tracker. This allows customers to follow their ordered food from the store to the place of delivery in real-time conditions. This tracker helps users to estimate where their order is and how long it will take to receive it. By implementing the online tracker, the company states that it increased customer waiting experience and overall user satisfaction (Domino's.nl, 2017).

Current studies about the waiting time are focusing on improving customers' waiting experience by providing the environmental cues which can influence perceived waiting time. However, these studies are mostly concentrated on the traditional environment, while research about the managing waiting process online just have started to appear. Some research have already examined how distractor cues, such as music and verbal and visual objects on the website loading page, can improve the waiting experience (Lee, Chen, & Ilie, 2012; Luo, 2015). Additionally, Lee, Chen, and Hess (2017) have examined the effect of temporal and distractor

information on perceived waiting time and found that two types of cues reduced perceived waiting time, which in turn triggered higher use intention. However, there is still lack of knowledge about how different design features of the temporal and distractor information affect the consumers' wait estimation. Accordingly, there are gaps in the online waiting time evaluation and how the synergy of both temporal- and distractor cues can improve the waiting process. This research aims to address the mentioned inconsistencies and proposes the following research question:

RQ: Does the use of temporal and distractor cues during a waiting process help to improve the users' waiting experience and overall satisfaction with the online service in an online environment?

This study takes a close look at progress bars and animated graphics, as the forms of temporal and distractor information. The research model of the current study represents how different cue types on the website waiting page can influence the perceptions about waiting experiences (i.e., perceived uncertainty, focussed immersion, temporal dissociation, and heightened enjoyment) and additionally the impact on perception of waiting time duration. Furthermore, it will be investigated whether the presence of a progress bar and an animation can benefit overall user satisfaction about the service and increase the intention to use the website again in the future. Consequently, a 3x3 between-subject experiment will be conducted to examine the influence of the mentioned cues on dependent variables.

This research tends to fill out inconsistencies of the previous research about the waiting process in several ways. Firstly, the study will help to understand how to use temporal information and distractors, both separately and in combination, to improve customer waiting experience. Moreover, as mentioned earlier, most studies about perceived waiting time evaluated the mechanism for time controlling in the offline environment, when much less attention was paid to the online settings. Further, the current experiment will examine the influence of environmental cues on overall user satisfaction about the website and individuals' intention to use it again when they want to order food online.

Overall, communication about the waiting process in the delivery services is considered to be a disruptive element between companies and clients. Therefore, the current study is also valuable from a practical perspective, as it aims to give a more in-depth insight to the managers about various mechanisms how to manipulate the waiting experience and perceived waiting time and to increase the users' satisfaction about the company's service.

2. Theoretical Framework

This section focus on existing relevant literature that discusses and presents results over the research variables of interest of the current study. The study is built around two theoretical bases: the attentional gate model and cognitive absorption theory. The theories in their relevance to the variables of the current study are described below. At the end of the section, the research model presents the assumed relationships between study concepts. As the concept of time perception is essential to understand the possible effect of temporal and distractor cues, the time perception construct is first defined.

2.1 Time Perception in the Waiting Environment

Time perception is a process of estimating the length of time, which highly depends on additional information provided other than actual time duration. It was concluded that the assessment of waiting length and overall perception of the waiting process are evaluated differently from person to person (Killen & Fetterman, 1988). Block and Zakay (1997) stated that the same waiting time could be estimated shorter or longer, depending on individuals' affective state, cultural background and external environmental cues.

Previous researchers have investigated two kinds of environmental cues for both online and offline settings, which are widely used to reduce the perceived waiting time, namely temporal information and distractors. Temporal information refers to time-related knowledge, which is provided to inform users about the amount of time that already has been passed or remains to wait (Osuna, 1985). The examples of the temporal information include timing indicators, countdowns, clocks, and progress bars. It was concluded, that time is perceived to be shorter when temporal information is provided because it helps to reduce the user's uncertainty about the waiting process (Osuna, 1985). Therefore, when people are presented with the information about time, they are feeling less stressed about the waiting, thus perceive time shorter (Zakay, 1989).

In contrast, the primary goal of distractors is to shift the attention in the direction away from waiting, therefore leaving fewer resources available to process timing. Distractors researched in previous studies are advertising information, mirrors in elevators (Maister, 1985), televisions and displays (Pruyn & Smidts, 1998). In the online waiting, environment distractors refer to the fillers on the webpages such as colours, music, and graphical elements. These are designed to distract people and fill their thoughts with information, which differs from the

waiting process. Luo (2015) stated that such features could provide users with a sort of entertainment, and direct their attention away from time, thus making waiting feel shorter.

Despite the fact that previous research already studied the impact of environmental cues on the waiting experience, there are still many inconsistencies in reported outcomes. For instance, some researchers found a positive control of temporal information on perceived waiting time (PWT) (Litmann, 2011; Hohenstein, 2016) while others showed no impact or even an adverse outcome (Zakay & Hornik, 1991). The same goes for distractor cues. Some studies report a positive impact of distractors on PWT (Katz, 1991) and some found an absence of effect or negative effect (Pruyn & Smidts, 1998).

There are several possible explanations for these inconsistencies in the studies' findings. Firstly, previous research has examined environmental cues without taking into consideration how their design characteristics can influence the waiting experience (Lee, Chen, & Hess, 2017). Secondly, despite Lee, Chen and Hess (2017) have examined the interaction between temporal and distractor cues. In their study distractors were integrated into the temporal cues design. However, still, no studies were conducted to examine the interaction effect of temporal information and distractors as independent from each other website elements. Therefore, the current study aims to fill these gaps by looking at temporal and distractor cues at the same time and measuring their main and interaction effects on the users' waiting experience in the online settings.

2.2 Psychology of Waiting Time

The subject of time estimation has become one of the heightened points of interest for social studies. Already for a long time, this research aims to manipulate the subjective time estimation among individuals (Allan, 1979). The process of timing evaluation has a close connection with psychological processes and person's interaction with the surrounded environment (Lallemand & Gronier, 2012).

Various models have been developed to determine the instruments, which affect the time perception (Block, 1990). As compared to other models, it seems that models based on attention are the most applicable to the waiting process, which occurs online. It happens because during human-computer interaction users are usually faced with the different types of cues on the waiting screen, which shifts their attention and reconstructs temporal estimation (Lallemand & Gronier, 2012). Consequently, the current study will focus on the theoretical fundamentals, which are based on attentional resources and time involvement, namely, attentional gate model

and cognitive absorption theory. These theories will be described in detail in the following sections.

2.2.1 Attentional Gate Model

The attentional gate model is proposed by Zakay and Block (1995). It combines different models of time perception, to explain the association between the attentional allocation and the time evaluation (Figure 1). Generally speaking, the ‘pacemaker,' is responsible for the so-called generating pulses in the human's brain, while the state of arousal brings out the alterations of these rates. Moreover, the attentional gate model includes one additional element, which is placed in between the pacemaker and the switch. It is called a ‘gate,' and it triggers the switch through the operationalization of temporal information (Lallemand & Gronier, 2012). When a person pays more attention to the temporal process, the gate opens, letting these timing signals to be dealt with by the brain from the pacemaker to a cognitive counter (Block & Zakay, 1997). On the contrary, when individual's attention is directed to the nontemporal external elements or events, the gate is closing, and fewer pulses will move from cognitive counter to working memory. Eventually, pulses saved in working memory are compared to the number of pulses, collected in the reference memory. Accordingly, the process of time estimation occurs based on this comparison of some pulses in two types of memories (Zakay & Block, 1995).

Overall, according to the attentional gate model, the experience of time length is affected by some informational materials, which are encoded and decoded by temporal and nontemporal processors (Thomas & Weaver, 1975). Usually, the stimuli materials and various cues prescribe which processor type is applied more. The extent of attentional allocation is determined by the kind of processed information. Thus, the more nontemporal information is presented, the less attention is paid to the time evaluation and vice versa (Zakay & Block, 1995).

Such a manipulation of stimuli material can lead to the reduction of perceived waiting time. Consequently, if there is need to shorten the perceived waiting time, the individual’s level of arousal has to be decreased or attention should be shifted from the waiting process (Zakay, 2005).

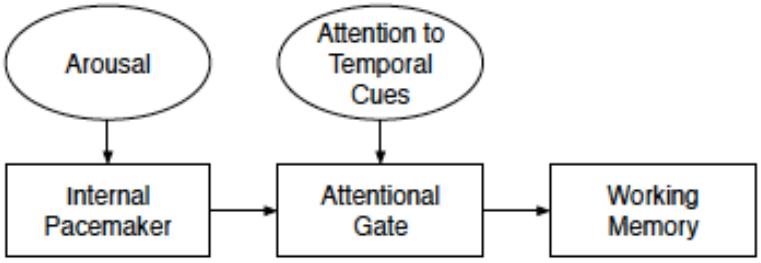

Figure 1. *Attentional Gate Model*

The attentional gate model is very suitable for studying the time perception and waiting experience in the computer-human interaction settings because its fundamentals can explain how distractors and temporal cues can affect the temporal evaluation among users (Lallemand & Gronier, 2012). Moreover, in the online environment, the attentional component is essential in studying the waiting time evaluation because interaction with a computer typically includes a lot of attentional resources to process the information of the screen (Casini & Macar, 1999). This model was already applied to study the impact of different displays feedback on time estimation and user experience (Brahaghan & Sanchez, 2009). Therefore, in this research, the attentional gate model is used as one of the theoretical bases to explain the perception of waiting time.

2.2.2 Cognitive Absorption Theory

Cognitive absorption theory is a relatively new theoretical fundament that navigates the users' experience in the online environment (Agarwal & Karahanna, 2000). This scientific theory is developed from the combination of other research constructs, which have examined the dimensions of individuals' psychological characteristics, such as the absorption condition, state of cognitive engagement (Webster & Ho, 1997) and the flow condition (Csikszentmihalyi, 1990). Consequently, these theoretical constructs were integrated with each other by Agarwal and Karahanna (2000) into a new dimension of cognitive absorption. This new dimension describes the user experience in the online environment. They claimed, that cognitive absorption is the condition of person's intensive integration with the software (Agarwal & Karahanna, 2000). Cognitive absorption is responsible for human-computer interaction experience, which can be affected by individual characteristics, external cues, and situational factors (p. 668). In web settings, the state of cognitive absorption in most cases can be reached and manipulated by design characteristics of website interfaces which are hedonically attractive for users (Agarwal & Karahanna, 2000).

In general, the cognitive absorption condition is explained with five different dimensions. Namely: temporal dissociation, focused immersion, heightened enjoyment, control and curiosity (Agarwal & Karahanna, 2000). Temporal dissociation is an inability to follow and control the passage of time while interacting with software. Focused immersion can be explained as the concentration of the particular task or information, while others attentional requests are ignored. Heightened enjoyment provides the pleasurable hedonic components from the human-computer interaction. Control provides the opportunity to be connected and informed about the interaction process, while curiosity is the state of arousal from web experience (Agarwal & Karahanna, 2000).

The current study is focused on the first three dimensions of the cognitive absorption theory, as they correspond the best to the research model about the waiting process. It was claimed that state of temporal dissociation is an essential predictor for the time evaluation process. When external materials distract the waiting process, it makes user disable to register the time passage (Agarwal & Karahanna, 2000). Therefore, individuals cannot precisely say, how long they are already waiting. At the same time, focused immersion is also one of the crucial elements of the waiting process because when users' attention is shifted from time itself, much less cognitive resources are directed to time duration (Lee, Chen & Hess, 2017). Finally, when users experience the enjoyment of the interaction with external hedonic cues, less attention is paid to the waiting process, making the perceived waiting time shorter (Zakay & Block, 2004).

Previous research showed that cognitive absorption is a significant predictor of human-computer interaction behaviour. For instance, Lee, Chen, and Ilie (2012) defined cognitive absorption as focused immersion, temporal dissociation and heightened enjoyment. They claimed its positive impact on perceived waiting time. Roca (2006) examined that cognitive absorption positively benefits to user’s service satisfaction. Furthermore, Rutkowski (2007) claimed about higher user performance in the online environment, for people with focused immersion and temporal dissociation. This study focuses on the first three dimensions of cognitive absorption theory, namely, focussed immersion, temporal dissociation and heightened enjoyment in the online waiting environment.

2.3 Progress Bar

Progress bars are usually applied to design the users' interfaces which depict the loading of the system operation (Myers, 1985). In the computer-human interaction (CHI) the progress bar is defined as temporal information, which is presented in the form of the bar filling

up from zero to complete process ending (Gronier & Lallemand, 2013). The progress bar displays the temporal process through the graphical and numbered way, informing the users, how much time already has passed and how much time is remaining to wait. Based on the research outcomes, the progress bar was shown to be the most acceptable form of temporal metaphor among users in drawing their attention and providing the feedback about the waiting time (Branaghan & Sanchez, 2009). Moreover, Myers (1985) claimed, that the usage of progress bar helps to increase users' self-efficacy and positive attitude towards the system. Additionally, it was found that a progress bar essentially increases the tolerance about the waiting duration and increases users' willingness to wait longer (Nah, 2006). Finally, it was shown, that in the online environment users preferred loading pages with progress bars over webpages without progress indicators (Myers, 1985).

Maister (1985) in his study about waiting time claimed that certain waits are perceived to be shorter, than the uncertain ones (Maister, 1985). Additionally, it was shown, that information about the waiting time helps to decrease the perceived waiting duration (Nah, 2004; Osuna, 1985). Hui and Tse (2006) found that individuals experience less uncertainty about the amount of waiting time once they were provided with information about duration.

Therefore, the progress bar, which provides the temporal information on the webpage during online waiting is supposed to strengthen the waiting process by decreasing users' uncertainty. Gronier and Lallemand (2013), claimed that with informational support of the progress bar about the waiting time users feel less frustrated about the waiting process. Additionally, it was stated, that progress bars help users to decrease uncertainty and enhance the control over the waiting because of their dynamic nature (Myers, 1985). Lee, Chen, and Hess (2017) also have shown that progress bar helps to lower the uncertainty level when users wait online. Based on the mentioned evidence, it is hypothesized that:

***H1a**: Users feel less uncertain about an online waiting process when watching a webpage with a progress bar as opposed to a webpage without a progress bar.*

Depending on its design characteristics, the progress bar can produce a different effect on users. One of the methods to influence the progress bar's perception is to manipulate the way it moves (Harrison, Yeo & Hudson, 2010). Usually, a linear moving mode is presented in a way, which is directly related to the amount of progress that has been completed. On the other hand, the non-linear function tends to change the speed of the progress bar with the unexpected pauses, accelerations or decelerations (Harrison, 2007).

Some research about the influence of progress bar's moving mode on perceived waiting time is already conducted (e.g., Harrison, 2007; Myers; 1985). However, there is still limited empirical evidence for the effect of progress bar's speed mode on the perceived uncertainty. Early studies have shown that users prefer constant linear feedback about waiting time rather than variable timing feedback (Carbonel, 2016; Miller, 1977). Additionally, Osuna (1985) claimed, that the more determined information about the wait, the less uncertain are users. In this study, it is assumed that there is an effect on perceived uncertainty depending on the progress bar moving mode, and it is expected that, when users will view progress bar with the constant linear way, their perceived uncertainty will be less, than during the wait with the accelerated progress bar. Thus, it is hypothesized that:

***H1b**: Users feel less uncertain about an online waiting process when watching a webpage with a constant progress bar as opposed to a webpage with an accelerated progress bar.*

One of the most significant benefits of the progress bar in waiting environment is that it gives users the chance to estimate how much time they need to wait (Myers, 1985). That means that the progress bar indicates the speed flow in which the software is processing the operation. Besides it informs if there is a breakdown or not. Therefore, the progress bar is an essential tool for evaluating the length of waiting. Previous research already showed that users prefer to control the waiting process and to make predictions about the time is left to wait (Gronier & Lallemand, 2013; Hohenstein, 2016; Nah, 2004; Harrison, 2010).

However, attentional gate model predicts, that the amount of attention is paid to waiting is positively related to perceived time duration (Zakay & Block, 1995). It happens because the temporal task keeps people involved in the waiting process and opens the attentional gate. According to this, it could be expected that progress bars as the temporal information would open the attentional gate and increase the perceived waiting time. Nevertheless, there is evidence to assume the opposite. For instance, it was found that the presence of the progress bar led to a shorter estimation of waiting time because people have higher self-control over the waiting process (Harrison, 2010). Myers (1985) also concluded that users feel more confident about waiting when the progress bar is presented and as a result, they estimate the time duration shorter compared to the systems without progress indicators. When confidence increases, the attentional gate model proposes that the gate can close because there is no need for the person

anymore to follow the time passage (Lee, Chen & Hess, 2017). Therefore, the next hypothesis is assumed:

H2a: *In the online environment, users perceive waiting time shorter when watching a webpage with a progress bar as opposed to a webpage without a progress bar.*

There are different ways and visual approaches to design a progress bar. It was concluded, that the perceived duration of the progress bar can be manipulated by changing its design and technical characteristics (Harrison, 2007). Therefore, the colour, length, shape and speed mode of the progress bar can influence the estimation of the loading time during the waiting process (Fredkinson & Kahneman, 1993). This happens because usually individuals do not remember the experience as a unite piece, but only emphasize the salient elements of waiting and make personal conclusions based on the notable moments (Harrison, 2007). Therefore, a crucial element in developing a progress bar is to consider how its design features can be remembered and how they can contribute to decreasing the perceived waiting time.

One of the ways to control the perceived waiting time with a progress bar is to change its moving character. Previous research already supported this idea and claimed that the moving mode of progress bars affect the estimation of the time duration (Harrison, 2007). Consequently, understanding which moving modes are perceived as shorter can give a meaningful insight about how to design an optimal progress bar.

Allan (1979) claims that people do not perceive time duration linearly. Instead, loading indicators with acceleration- and power functions are perceived by users as shorter compared to linear ones (Kim & Xiong, 2017). This statement was also supported by Harrison (2007), who stated that linear progress bars are estimated to be longer than progress indicators that speed up during the process. A possible explanation for these conclusions can be derived from the attentional gate model (i.e., the number of attentional resources an individual needs to put on to process the progress bar). While it is more natural to indicate when the constant progress bar will end up, it is more challenging to make this prediction for the accelerated progress bar (Kim & Xiong, 2017). Consequently, more attentional resources are required to process the accelerated bar. According to attentional gate model, the more attention a user pays to stimuli, the closer the gate is and the less attention is paid to the waiting process itself (Zakay & Block, 1995). Therefore, in the current study, it is assumed that users will estimate the length of time shorter when the accelerated progress bar is presented than when participants observe the constant progress bar. Thus, it is hypothesized that:

H2b: *In the online environment, users perceive waiting time shorter when watching a webpage with an accelerated progress bar as opposed to a webpage with a constant progress bar.*

Furthermore, when people are waiting online, they are in need of temporal informational feedback about the wait. Thus a progress bar appears to be suitable for users to satisfy these needs. If the user is not satisfied, then he most probably will not re-use a website in the future (Egorow, Siegert & Wendemuth, 2017). Consequently, if a website meets users' needs, provides the high-quality system performance and rich response information, users estimate this website as a well-developed and high-quality (Qutaishat, 2013). Nielsen (2000) supported this conclusion and claims that a low-quality website decreases user satisfaction and intention to use the website in the future again.

Sam and Tahir (2009) found that progress bars make the website more flexible and convenient for users. Moreover, temporal feedback in the form of a progress bar was proven to be the most acceptable and useful (Nah, 2004). According to Gronier & Lallemand (2013), a progress bar makes users feel better about the waiting, which consequently improves their level of online satisfaction. People who are exposed to the progress bar during their online wait have shown a high behavioral intention to use this web service again in the future. (Hausman & Siekpe, 2009). Overall, designing a progress bar in the online wait environment benefits to the users' tolerance towards the web system (Nah, 2004).

However, depending on the design of the progress bar, users can evaluate the system differently. While the constant progress bar continues to move permanently, the accelerated one can be perceived as a system delay because of its slow speed movement at the beginning of the loading process. Consequently, the system can be evaluated lower because of the perceived delay. Kuhnmann (1989) stated that more extended system responses cause lower user's satisfaction and intention to use the web service again. Usually, slow system response is frustrating and annoying for people. It can be a dominant factor, which significantly increases so-named 'user think time') when users subjectively estimate how long the system worked on the request (Shneiderman, 1998). Therefore, users need to have the feeling that the system works efficiently and correctly (i.e., without interruptions and stop intervals). This increases users' satisfaction and keeps a positive attitude towards the website (Hoxmeier & DiCesare, 2000). Based on the mentioned evidence, it can be assumed, that the presence of a progress bar will positively affect users' satisfaction and intention to use the website again. However, an

accelerated progress bars will be evaluated as a system delay, because of its perceived longer response time, which accordingly will lead to lower users' satisfaction and use intention as compared to the website with the constant progress bar. Therefore, it is hypothesized that:

H3a: *Users are more satisfied with a website when a progress bar is presented during the waiting process, as opposed to a website without a progress bar.*

H3b*: Users are more satisfied with a website when a constant progress bar is presented during the waiting process, as opposed to a website with an accelerated progress bar.*

H4a*: Users' intention to use a website is higher when a progress bar is presented during the waiting process, as opposed to a website without a progress bar.*

H4b*: Users' intention to use a website is higher when a constant progress bar is presented during the waiting process, as opposed to a website with an accelerated progress bar.*

2.4 Distracting Animated Visuals

A distractor can be defined as an event or cue, which manipulates the user's attentional resources in the waiting environment (Lee, 2012). The primary task of distractors is to shift the individuals' attention from time, therefore reducing the perception of the waiting time. The distraction cue effect can be explained by the attentional gate model, that stresses on a limited amount of attentional resources, which people possess. Accordingly, once a distracting cue is catching individual's attention, the attentional gate for the waiting process is becoming more closed, making users less concentrated on time counting (Block & Zakay, 1996).

One of the most effective distractor cues in the waiting time process are visual elements. In web design, visual elements are commonly used to catch users' attention (Lee, Chen, & Ilie, 2012). It was claimed that graphical symbols on the computer displays serve as a tool to distract individuals from waiting while making them concentrated on the presented picture (Nah, 2004). In their study about the human-computer interaction (HCI), Cai and Xu (2011), stated that it is significant to use the aesthetically attractive elements to catch humans' attention and make their interaction with a computer more pleasant and enjoyable. Several studies about HCI report about the attention drawing (Janiszewski, 1998; Yantis & Egeth, 1999) and temporal dissociation effects (Zakay, 1989) of the visual cues in the waiting process. At last but not at

least, the animated materials have great potential to manipulate users' perception on the waiting time length. It was claimed that, when users observe the animated graphics, their attention is shifted away from time. This leads to a shorter estimation of the waiting time. This is in line with the attentional gate model, which says that the less attention is paid to the waiting, the shorter users perceive time duration.

It was shown that animated visual elements in the user interface design have a high potential to catch individuals' attention (Janiszewski, 1998). However, there are two types of animation: hedonic and functional. They differ from each other regarding the amount of attention they can catch. The difference between the hedonic and functional animation can be explained by its graphical characteristics. The hedonic animation is designed to cause the aesthetic enjoyment and pleasure-related benefits while viewing the motion symbols (Strahilevitz & Myears, 1998). Accordingly, the design of hedonic animations consists of various graphical elements, congruent colours and sometimes audio support. Unlike the hedonic animation, the functional animation is designed in a more formal graphical format. Usually, it serves as a tool to inform about the system's loading. Consequently, design features of functional animation are uncomplicated and straightforward as compared to hedonic animated materials. For example, in the case of the waiting process, the functional animation can be presented in a form of moving dots or other geometrical figures.

Norman (2002) claims that graphical elements which urge emotion have a more significant potential to grab user's attention compared to functional graphical symbols. When the animation is imaginary-provoking, it has a high ability to hold people’s attention, making them forget about other tasks (Nisbett & Ross, 1980).

Consequently, when users are observing hedonic animations on the waiting display (e.g., the process, how a coffee machine is producing coffee) their attentional resources should be more shifted from the waiting process than when a functional animation (e.g., moving dots or geometrical figures) is presented. Therefore, it can be assumed:

***H5a**: In the online waiting, users experience less focused immersion on the wait when watching a webpage with animation as opposed to a webpage without animation.*

***H5b:** In the online waiting, users experience less focused immersion on the wait, when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation.*

Additionally, the presence of animated cues will lead the users' attention to visual objects, therefore generating the process of temporal dissociation (Janiszewsky, 1998). Temporal dissociation produces an inability to follow the passage of time while interacting with stimuli materials (Agarwal & Karahanna, 2000). In consistency with the attentional gate model, salient animated cues are becoming the focal attentional elements on the webpage, while producing the effect of temporal dissociation (Zakay, 1989). It happens because human attention capacity is limited. Therefore, attentional resources cannot be applied simultaneously to all cognitive processes. In the online environment, the interface and visual stimulus can generate the feeling that waiting the process is 'filled,' producing the effect of temporal dissociation (Maister, 1985).

Consequently, the more a user pays attention to distractors, the more they will be dissociated from time duration. As mentioned previously, aesthetical elements of animations on webpages are catching users' attention and make them involved in the depicted process (Jennings, 2000). The attentional gate model postulates that high-required attentional objects decrease the ability to evaluate time passage (Block & Zakay, 1996). Accordingly, if hedonic animations require more attention than the functional animation, the process of temporal dissociation will occur more likely when the hedonic graphic is presented. Therefore, it can be suggested, that:

H6a: *When waiting online, users experience more temporal dissociation, when watching a webpage with animation as opposed to a webpage without animation.*

H6b: *In the online waiting, users experience more temporal dissociation, when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation.*

Furthermore, animated cues on waiting displays can also produce feelings of enjoyment among users. Heightened enjoyment is defined as receiving positive feeling from an interaction process with stimuli materials (Agarwal & Karahanna, 2000). It states that in the online environment stimuli materials can decrease the negative emotions and feelings, caused by the waiting process (Taylor, 1994). Consequently, waiting will arise unpleasant emotions if there is no exciting information throughout the wait. Therefore, the more exciting and attractive materials, the more amusement users experience while waiting (North, 1999).

Ravaja (2004) claimed that messages that are presented in the graphic motion form lead to high emotional arousal among consumers. Animation graphics serve as an entertainment resource, therefore splitting attentional sources and making the waiting time more pleasant and speedy (Hohenstein, 2016). Norman (2002) stated that visually attractive graphics should lead to the higher enjoyment and entertainment compared to the functional graphics. In the context of the current study, it is assumed that a hedonic animation, as an imaginary-provoking cue, will enhance users' fun experience and heightened enjoyment as compared to the functional animation. Therefore, the following hypothesis is proposed:

H7a*: When waiting online, users experience more heightened enjoyment, when watching a webpage with an animation as oppose to a webpage without an animation.*

H7b: *In the online waiting, users experience more heightened enjoyment, when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation.*

The more an animation is entertaining the more it can manipulate a users' perception of the waiting time because it attracts more individuals' attention and shifts cognitive resources from the waiting process (Nielsen, 2000; Diao & Sundar, 2004). As the attentional gate model suggests, the more a user pays attention to the animation itself, the shorter he estimates the amount of waiting time. This effect can be explained by the famous 'time flies when you are having fun' hypothesis, which means that stimuli materials, which positively influence users' affective state, have the potential to reduce the perception of waiting time (Kellaris & Kent, 1992). Because animations prove to manipulate users' emotions and feelings (Ravaja, 2004) it might also shift the personal perception of waiting time.

Consequently, it can be assumed that an animation, which arouses more positive emotions and affective states, will also contribute to shorter waiting time estimation. It is proven that hedonic type of animations create more emotional reactions such as excitement, feeling arousal, or curiosity than functional animations (Norman, 2002; Janiszewski, 1998). Additionally, Nisbett and Ross (1980) claim that hedonic animated graphics are more emotionally provoking compared to functional. Thus, it can be expected that viewing a webpage with hedonic animation will lead to shorter waiting duration evaluation. As a result, we hypothesize that:

H8a: *In the online environment, users perceive waiting time shorter when watching a webpage with animation as opposed to a webpage without animation.*

H8b*: In the online environment, users perceive waiting time shorter when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation.*

As mentioned, animation is responsible for providing users with a necessary amount of pleasure, fun, and enjoyment during their interaction with a website (Huang, 2003). The appropriate graphical design directly affects the users' estimation of the website (Crowley, Spangenberg & Hughes, 1992). Consequently, users will be satisfied if websites are enjoyable to observe and pleasant to use (Venkatesh, 2000; Igbaria, Schiffman & Wieckowski, 1994).

The animation was proven to be an authoritative emotional website attribute. Harley (2014) concluded that animated graphics are perceived as an amusement among users because they make particular website characteristics notable and visible and increases the positive personal satisfaction about the system. It is also stated that the usage of animation on a website interface enhances positive user's attitude (Chang & Ungar, 1995). Schaik and Ling (2008) in their study about user's experience claim that animation significantly strengths usability level and visual attractiveness of a website. As a result, users are satisfied with the web service and intend to use it again in the future.

Yet, there is no research conducted to examine whether functional and hedonic animation types differ in their effect on the user's satisfaction and intention to use. However, there is a substantial scientific support that users prefer website interfaces that trigger emotions and are aesthetically attractive (Schenkman & Jonsson, 2000; Tractinsky, Katz & Ikar, 2000). Green & Jordan (2002) claim that the presence of fun and beautiful graphics on a website interface are attractive to the users and trigger positive reactions about the products on the website. In the current study, it was also assumed that a hedonic animation is more emotionally pleasant and is better looking as compared to the functional animated graphic. Consequently, it is expected that the animated graphics will positively affect the user's satisfaction and intention to use the website again. Additionally, it is also hypothesized that a hedonic animation will lead to the higher user's satisfaction and behavioural use intention than a functional animation. Thus, the following hypotheses are proposed:

H9a*: Users are more satisfied with a website when an animation is presented during the waiting process, as opposed to a website without animation.*

H9b: *Users are more satisfied with a website when a hedonic animation is presented during the waiting process, as opposed to a website with a functional animation.*

H10a*: Users' intention to use a website is higher when an animation is presented during the waiting process, as opposed to a website without animation.*

H10b*: Users' intention to use a website is higher when a hedonic animation is presented during the waiting process, as opposed to a website with a functional animation.*

2.5 Combination of Temporal Information and Distractors

We discussed how the combination of the two types of cues, namely temporal cue (i.e., progress bar) and distractor cue (i.e., animation) influence the waiting process, estimation of waiting time and user satisfaction about a website. In a study about the waiting process online, Lee, Chen, and Hess (2017) were looking at the interaction between temporal and distractor cues. However, in their experiment the distractors were examined as integrated design features of the progress bar, while no research was conducted to investigate the interaction effect of temporal information and distractors as independent from each other website elements.

In the current study, it already has been hypothesized that emotionally provoking animation on the waiting display will help users to increase the heightened enjoyment, while they are waiting online. Similarly, it was proposed that an accelerating progress bar will make the waiting process more entertaining, increasing individuals' enjoyment. In their study about design features of progress indicators for online videos, Kim & Xiong (2017) showed that 62% of the participants preferred the progress indicators combined with the graphical elements because the waiting process was more pleasant and the estimated time duration was shorter than when these cues were presented separately. Moreover, nowadays in computer games the progress indicators are often used in combination with animated game heroes and figures, with a purpose to provide the users with some amusement and to increase the user satisfaction about the system (Liikkanen & Gomez, 2013).

Given the expected positive influence of each of these cues on waiting experience and user satisfaction about a website, it is assumed that even despite their different nature (i.e., temporal information and distractor) they can anticipate an even more significant effect when using them simultaneously on the waiting display. While a progress bar provides more task-relevant information about the waiting time, animated graphics serve as an emotionally-

provoking and entertainment tool. Consequently, when they are presented together users satisfy both their utilitarian and hedonic needs. Therefore, it is hypothesized that:

H11*: When waiting online, the positive influence of progress bar on the perceived uncertainty, focused immersion, temporal dissociation, heightened enjoyment, perceived waiting time, user satisfaction and intention to use is even greater with the animated graphics on the webpage.*

2.6 Research Model

Based on the attentional gate model, cognitive absorption theory, and the results from previous research about waiting time, the current study assumes the positive effect of temporal information and distractor cues on the perception of the waiting time duration (PWT), user satisfaction, and intention to use the website. The model proposes that temporal information decreases the perceived uncertainty (PU) of waiting time, while distractors in the form of hedonic animated cues tend to reduce the focused immersion (FI) on the waiting time, increase temporal dissociation (TD) from waiting and positively benefit to the heightened enjoyment (HE). Consequently, in the model developing, the focus was made not only on the actual estimation of the time duration but also on the examination of users' waiting experience and satisfaction from the overall website usage. Accordingly, the following research model is proposed:

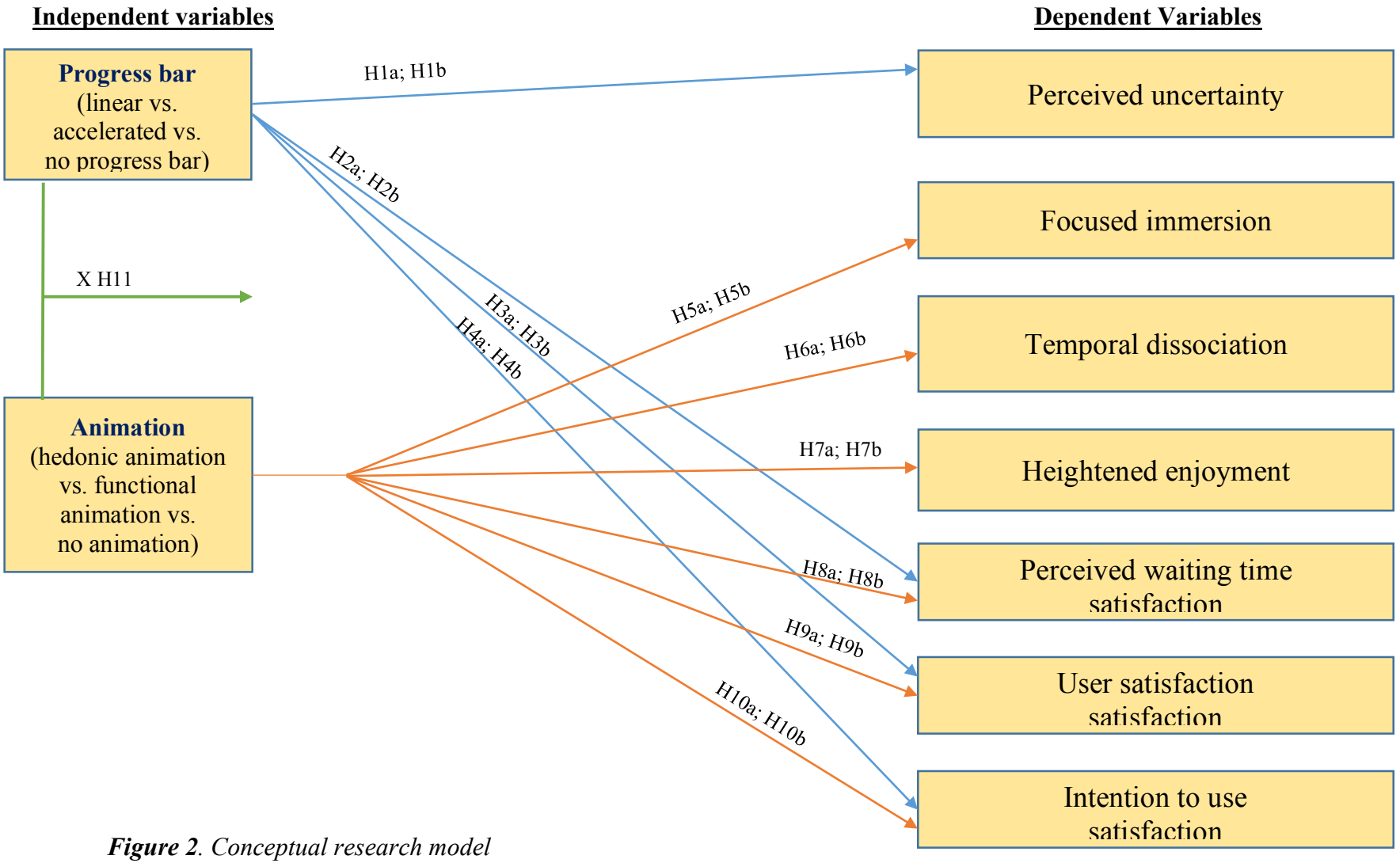

Figure 2. *Conceptual research model*

3. Research Method

In the previous section, the main elements of the research model were introduced, which serve as fundamentals for the research method, presented below. Paragraph 3.1 presents the research design, followed by the sections about the procedure, stimuli materials creation and manipulation check. The last two paragraphs are focused on the demographic information and measurements of the research constructs of the current study.

3.1 Research Design

The between-subject experimental study was conducted to examine the effects of temporal information (i.e., progress bars) and the distractors (i.e., animated visuals) on the PU, FI, TD, HE, PWT, user satisfaction, and intention to use the website. The simulative website's pages were designed, with the different environmental cues, depending on the experimental condition.

The current study utilizes a 3 (Progress bar: constant linear/ accelerated/ no progress bar) x 3 (Animation: hedonic animation/ functional animation/ no animation) between subject experimental design. Consequently, nine experimental condition groups were developed to test which combination of the independent variables on the website waiting page leads to the lowest perceived uncertainty and focused immersion, highest temporal dissociation and heightened enjoyment, shortest perceived waiting time, and the best user satisfaction together with the intention to use. No additional control group has been added as the ninth experimental condition was already a control group (i.e., a blank webpage with no progress bar and no animation), which examined the main effect of the progress bar and animation.

Table 1. '3x3 between-subject' research design

	Hedonic animation	**Functional animation**	**No animation**
Constant linear progress bar	N = 24	N = 27	N = 42
Accelerated progress bar	N = 23	N = 25	N = 24
No progress bar	N = 28	N = 27	N = 23

3.2 Procedure

The main study was conducted in the form of a controlled laboratory environment. The participants were invited in the laboratory room on the campus of the University of Twente to observe the developed website and fill out the questionnaire. The recruited participants were randomly assigned to one of the nine experimental conditions with the randomizer tool of Qualtrics.com. The experiment started with the short scenario, with a purpose to let participants comprehend the experimental situation. Participants were asked to imagine, that they are ordering coffee online, which will be, consequently, delivered to them to the place of order. Firstly, the objects selected the coffee they want to order, from the variants provided on the output screen, and after the participants clicked on the button "proceed the order" to start the waiting process.

All participants were waiting, while viewing the waiting screen for 60 seconds, with different website design cues, depending on the experimental conditions. After that, the website displayed the waiting results, asking subjects to imagine, that their coffee has been delivered. Finally, participants were asked to fill out the questionnaire.

A series of 5- point Likert scales questions were presented to indicate the participants' level of PU, FI, TD, HE, PWT, user satisfaction and intention to use. The survey was ended with the questions about the respondents' age, gender, nationality, and education level. It required participants approximately twenty minutes to complete the experiment.

3.3 Stimulus Materials

For the main study, different website screens were created, containing a simple background and the corresponding environmental cues. The displays were kept as simple as possible to reduce any side effects of people perceptions while they are waiting. Before showing the screens, a short scenario was presented, which included the following text: "Imagine you are busy in the library on finishing one of the assignments. Feeling, that you get tired you want to drink a cup of coffee. However, you run out of time, and you decide to order the coffee online on the cafe website. Accordingly, after ordering, the coffee will be delivered to you to the place where you study."

The website pages

For this study, different website pages were developed: an input screen, a waiting screen, and the output screen. Filters have a brown shades background colour to maintain design

congruence since it was examined that when it comes to design colours, brown is the most coffee-associated shade (Nanta, 2015). The input and output web pages stayed identical for all experimental conditions, while the waiting pages were changed depending on the environmental cues presented on it. The input page allowed participants to select one coffee option out of five non-existent coffee names, to avoid attitude bias to real coffee brands (see Figure 3). Output page presented the following information: "Imagine that your coffee has been delivered! Please come back now to the website with questionnaire" (see Figure 3).

Figure 3. *Input and output website pages*

The progress bars

The first progress bar design is the linear progress bar with the constant 60 seconds forward-moving decelerating green colour pattern. The next, power, progress bar was designed by the same principle, design features, and loading duration. However, there was accelerated growth in the speed of the forward-moving pattern. The moving speed started to increase after every twelve seconds, and, the closer was the pattern to the end of the bar, the quicker it moved (Figure 4).

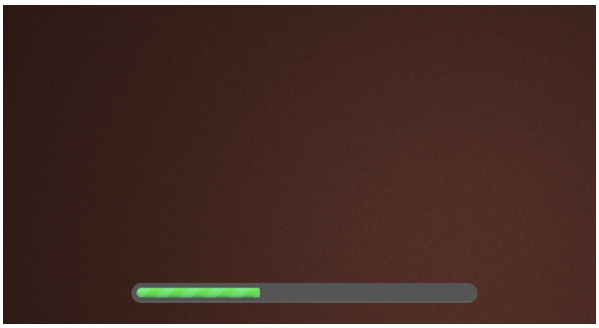

Figure 4. *Progress bar stimuli material*

The animated visuals

The graphical animated elements were created for the study to present them independently and next to the progress bars on the website loading screens. The two types of the animated visuals were designed, namely, hedonic and functional (see Figure 5). The hedonic animation has depicted the process of coffee machine preparing the coffee. On the contrary, the functional animation has represented the movement of the dots from left to the right.

***Figure 5**. Hedonic and functional animation stimuli materials*

3.4 Manipulation Check

With a purpose to develop the treatment conditions for the presence of progress bars and the distinction of the animation type on the waiting screen, manipulation check was conducted to estimate if subjects perceive the stimuli materials how it is assumed in the study. Consequently, 23 people were recruited. After introducing the purpose of the study, they were presented with stimuli materials, following by the short questionnaire about the understanding of elements. Consequently, 12 participants were randomly assigned to the condition with the constant progress bar, and 11 subjects evaluated the accelerated progress bar. Moreover, each participant viewed two different types of animation (i.e., hedonic and functional) and estimated the difference between them.

Firstly, the control treatment was manipulated (i.e., the presence of the progress bar), which can be examined by the next question: "Out of the following options, indicate please, what object have you observed while viewing the loading screen?". As a result, 87 percent of respondents (N=20) correctly identified the progress bar. Moreover, it was checked if participants could perceive differently two types of the progress bar (i.e., constant and accelerated). For two different progress bar conditions, 81,8 (N=9) percent of respondents correctly identified the accelerated progress bar, and 83,3 (N=10) percent distinguished that progress bar moved steadily.

Table 2. Progress bar estimation

	Recognized	**Not recognized**	**Total**
	% (N)	% (N)	% (N)
Constant progress bar	83,3 (10)	16,7 (2)	100 (12)
Accelerated progress bar	81,8 (9)	18,2 (2)	100 (11)

Additionally, with a single item respondents were asked about the personal acceptance of experimental waiting time ("The amount of time I was waiting on the website page was acceptable for me"). The majority of respondents completely agree, mostly agree and slightly agree about the waiting time duration (17,4 percent, 34,4 percent, and 17,4 percent respectively).

To control the difference between hedonic and functional animation the participants were asked to indicate which animation type was more fun, enjoyable and exciting to watch. For all three items, 87 percent of subjects have preferred the hedonic animation over the functional.

Table 3. Animation evaluation

	Hedonic animation	**Functional animation**	**Total**
	% (N)	% (N)	% (N)
Fun to watch	87 (13)	13 (3)	100 23
Enjoyable to watch	87 (13)	13 (3)	100 23
Exciting to watch	87 (13)	13 (3)	100 23

Finally, it was essential to examine if the participants had some additional comments about the study materials, which can be implemented for the main study. Most of the respondents did not have any recommendations for material improving. However, some of the participants proposed to combine the progress bar with some animated elements. In fact, this combination of material was already implemented for the main study as one of the research goals. Therefore, no additional steps should be taken. Overall, the independent variables were successfully manipulated. Thus, they can be applied for the main study.

3.5 Participants

The recruitment of the participants took place through the researcher's private network and the person approaching of people to participate in the experiment. The participants were also asked to encourage other people from their network to take part in the study to create the snowball effect. In total 243 (N=243) subjects participated in the experiment. All responses were found to be sufficient because each participant followed the study instructions and answered all survey questions. The sample for the main study included 147 men (60,5%) and 96 women (39,5%). Aged of the participants ranged from 18 to 62, with an average age of M= 24, 83 (SD= 5,02). The most significant number of participants represented the student population of the University of Twente, where the experimental study was conducted. Some criticism exists about the generalization of the studies done with student participants (Wells, 1993). However, university-aged young people are the most active online users (Pew Research Center, 2014). Thus this sample is sufficient to analyse the perception of online system performance.

175 (75%) study participants have research university educational level, followed by 50 (20,6) participants who study in the universities of the applied sciences. 7 (2,9%) respondents indicated that they have secondary school education level and 11(4,5%) individuals claimed about another type of education. An overview of the demographic information can be found in Table 4.

3.5.1 Homogeneity Between Conditions

To examine whether the sample characteristics were homogeneous over the all-condition groups the ANOVA and Chi-square tests were conducted. The result of the ANOVA test showed that the distribution of the age of participants did not differ significantly (alpha > 0.05) for all condition groups ($F (8, 242) = 0.44$, $p= 0.897$).

Additionally, the Chi-square test was conducted to examine the difference between gender distribution inside the experimental groups for progress bar and animation. The Chi-square statistic for the educational level was $X^2(8)> =15.13$, $p= 0.917$, which is higher than significance level 0.05. This indicates that there is no difference in the distribution of education level inside the condition groups. Furthermore, the Chi-square test for the gender stated $X^2(8)> = 5.37$, $p= 0.717$, which is higher than alpha level 0.05. Therefore, the amount of female and male study participants is equally distributed through the all experimental conditions.

Table 5. Demographic information

Demographic Construct	Hedonic* Constant N=24	Hedonic* Accelerated N=23	Functional* Constant N=27	Functional* Accelerated N=25	Hedonic N=28	Functional N=27	Accelerated N=24	Constant N=42	Control group N= 23	Total N=243
Gender, N (%)										
Female	5 (20.8%)	10 (43.5%)	12 (44.4%)	10 (40%)	14 (50%)	10 (37%)	10 (41.7%)	16 (38.1%)	9 (39.1%)	96 (39.5
Male	19 (79.2%)	13 (56.5%)	15 (55.6%)	15 (60%)	14 (50%)	17 (63%)	14 (58.3%)	26 (61.9%)	14 (60.9%)	147 (60.5
Age, M (SD)										
	24.83 (4.27)	24.57 (5.55)	23.74 (2.41)	25.32 (7.34)	24.93 (3.57)	25 (2.94)	25.75 (6.29)	25.21 (6.64)	23,83 (2.94)	24.83 (5.
Education, N (%)										
Secondary education	-	-	2 (7.4 %)	1 (4.0%)	1 (3.6%)	1 (3.7%)	1 (4.2%)	1 (2.4%)	-	7 (2.9%
University of applied sciences	7 (29.2%)	5 (21.7%)	5 (18.5%)	5 (20%)	6 (21.4%)	5 (18.5%)	3 (12.5%)	11 (26.2%)	3 (13%)	50 (20.6
Research university	16 (66.7%)	16 (69.6%)	20 (74.1%)	17 (68%)	19 (67.9%)	20 (74.1%)	20 (83.4%)	27 (64.3%)	20 (87%)	175 (72
Other	1 (4.2%)	2 (8.7%)	-	2 (8%)	2 (7.1%)	1 (3.7%)	-	3 (7.1%)	-	11 (4.5
Nationality, N (%)										
Dutch	12 (50 %)	12 (52.1 %)	10 (37 %)	9 (36 %)	7 (25%)	11 (40.7 %)	10 (41.3%)	21 (50%)	10 (43.5%)	101 (41.5
German	-	2 (8.7 %)	2 (7.4 %)	3 (12 %)	4 (14 %)	2 (7.4 %)	3 (12.5%)	3 (7.2 %)	3 (13 %)	20 (8.2
Mexican	1 (4.2 %)	2 (8.7 %)	1 (3.7 %)	-	1 (3.6 %)	3 (11.1 %)	1 (4.2 %)	3 (7.2 %)	3 (12 %)	15 (6.1
Indian	-	-	1 (3.7 %)	2 (8 %)	3 (10.7%)	4 (14.8 %)	2 (8.4 %)	1 (2.4 %)	2 (8.7%)	15 (6.1
Greek	4 (16.7 %)	1 (4.3 %)	3 (11.1 %)	1 (4 %)	1 (3.6%)	-	2 (8.4 %)	2 (4.8 %)	-	14 (5.7
Indonesian	1 (4.2 %)	-	1 (3.7 %)	3 (12 %)	2 (7.1 %)	2 (7.4 %)	-	3 (7.2 %)	-	12 (4.9
Ethiopian	2 (8.4 %)	1 (4.3 %)	1 (3.7 %)	4 (16 %)	1 (3.6 %)	-	-	1 (2.4 %)	-	10 (4.1
Spanish	1 (4.2)	2 (8.7 %)	1 (3.7 %)	1 (4 %)	-	-	1 (4.2 %)	3 (7.2 %)	-	9 (3.7%
Chinese	1 (4.2 %)	-	2 (7.4 %)	-	2 (7.2 %)	-	-	1 (2.4 %)	-	6 (2.4%
Others	2 (8.4 %)	3 (12.9 %)	5 (18.5 %)	2 (8%)	7 (25.2%)	5 (18.5 %)	5 (21 %)	4 (9.6%)	5 (22.8 %)	41 (17.3

3.6 Measures

Various 5-point Likert scales were used to measure the dependent variables. Therefore, participants needed to indicate to what extent they do agree or disagree with a particular statement. For the PWT measurement, one open question next to the closed questions was used, where participants were asked to indicate the perceived time they were waiting in a number of seconds. The questionnaire following the presented website pages consisted of three main sections: 1) questions about the waiting experience questions (i.e., perceived uncertainty, focused immersion, temporal dissociation, heightened enjoyment), 2) questions about the PWT, user satisfaction, and intention to use and 3) general demographic questions.

The items for the perceived uncertainty were adopted from the Gorn (2004) and Agawal and Karahanna (2000). Questions about the heightened enjoyment were used from Agarwal and Karahanna (2000) and Lee, Chen, and Ilie (2012). Items for the focused immersion and temporal dissociation were derived from also from Lee, Chen, and Ilie (2012). The items in the Likert scale for perceived waiting time were party derived from Gorn (2004). One item ("Indicate in seconds how long in your opinion you were waiting on the website page") was added to the original scale. The scale to measure the user satisfaction was adopted from Flavian (2006) and Doll and Torkzadeh (2004). Finally, the measurement scale for intention to use was adapted from previous research of Munoz-Leiva (2016) and Palmer (2002). Established scales are summarized in Table 6.

Table 6. Constructs and Established Scales

Construct	**Established Scales**
Perceived uncertainty	Agarwal & Karahanna (2000); Gorn (2004)
Focused immersion	Lee, Chen, & Ilie (2012)
Temporal dissociation	Lee, Chen, & Ilie (2012)
Heightened enjoyment	Agarwal & Karahanna (2000); Lee, Chen, & Ilie (2012)
Perceived waiting time	Gorn (2004)
User satisfaction	Flavian et al. (2006); Doll & Torkzadeh (2004)
Intention to use	Munoz-Leiva (2016); Palmer (2002)

The items were modified with the regards to the research questions and scenario of the current study to provide high content validity. After the scale developing, the reliability check

was performed to examine the scales' Cronbach's alpha. Analysis showed that the internal reliability of the constructs 'perceived uncertainty', 'focused immersion,' 'temporal dissociation,' 'heightened enjoyment,' 'perceived waiting time,' 'user satisfaction,' and 'intention to use' were all above 0,70. Thus all constructs were sufficient to use in the current research.

The scale items, which were used for each dependent construct with the Cronbach's Alpha, means, and standard deviations are presented in table 7.

Table 7. Constructs: reliability scores, mean scores, standard deviations values and items

Construct	Cronbach's alpha	M (SD)	Items
Perceived Uncertainty (PU)	0.89	2.72 (1.10)	1. When waiting online on the website page I felt uncertain over the time passage. 2. I felt that I was uncertain over the time duration. 3. I felt uneasy when I was waiting on the website page. 4. I felt concerned when I was waiting on the website page. 5. I felt uncertain when I was waiting on the website page. 6. I felt unsettled when I was waiting on the website page.
Focused Immersion (FI)	0.85	2.90 (1.07)	1. I was intensively absorbed in the amount of time I need to wait on the website page. 2. My attention was focused on the time I need to wait on the website page. 3. I concentrated fully on the wait while expecting the website page was loading. 4. I was deeply immersed in the wait when expecting the results on the website page.
Temporal Dissociation (TD)	0.78	2.28 (1.00)	1. I lost track of time when I was waiting on the website page. 2. I was unconscious of the passage of time while waiting on the website page. 3. While waiting for the website page to be loaded I forgot the passage of time.
Heightened Enjoyment (HE)	0.92	2.34 (1.15)	1. Waiting on the website page was pleasant. 2. Waiting on the website page was enjoyable. 3. Waiting on the website page was fun. 4. Waiting on the website page was boring. 5. Waiting on the website page was annoying.
Perceived Waiting Time (PWT)	0.96	2.23 (1.11)	1. My online waiting on the website page was fast. 2. My online waiting on the website page was speedy. 3. My online waiting on the website page was quick.

Online Satisfaction	0.85	2.66 (0.99)	1. The overall experience with the website has been satisfactory. 2. In general terms, I am satisfied with the service I have received from the website. 3. In general terms, I can say that the website is satisfactory to observe. 4. The website gives me the information what I expected.
Intention to Use	0.88	2.58 (1.10)	1. I intend to continue using this website in the future. 2. I would use the website in my daily life to order the coffee online. 3. If I get to order the coffee online I expect that I will use this website.
Note: 5-point Likert scales were used to measure the items above (1=not true to 5=very true)			

4. Results

In this chapter, the output from the results of the current experiment is presented. With a purpose to test the hypotheses, various statistical tests were conducted by using SPSS 24. Firstly, the multivariate analysis of variance (MANOVA) was performed to examine the main and interaction effects of the independent variables on dependent ones. Additionally, analyses of variance (ANOVA) with the Bonferroni tests were conducted to check if there were any differences in means between the different types of progress bars and animation on the dependent variables. With this analyses, the descriptive results of the mean scores of the dependent variables were observed.

4.1 Multivariate Analyses of Variance (MANOVA)

With a purpose to investigate the main effect of the independent variables on the dependent variables, multivariate analysis of variance (MANOVA) was performed. First of all, in order to examine the overall effect of independent variables, the Wilks' Lambda test was conducted. The results have showed significant effect of the progress bars ($p<0.001$), animation ($p<0.001$) and the interaction effect ($p= 0.008$), which is below the alpha level ($a= 0.05$). In the Table 8, the statistical outcomes of the test are presented.

Table 8. Multivariate analysis of variance (MANOVA)

Multivariate test	Design Effect	F-value	Sig.
Wilks' Lambda	Progress bar	5.24	.000
	Animation	9.58	.000
	Progress bar*Animation	1.77	.008

4.2 Perceived Uncertainty

It was hypothesized that 'perceived uncertainty' of the participants would be lower when the progress bar is used instead when the website page is without the progress bar. Moreover, it was expected that the constant progress bar leads to the lower 'perceived uncertainty', as compared to the accelerated progress bar.

Table 9. Means and standard deviations for 'perceived uncertainty' on a 5-point Likert scale

	Perceived Uncertainty, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	4.18 (0.67)	3.25 (1.00)	2.57(1.08)	3.28 (1.14)
Constant	2.06 (0.73)	2.54 (0.94)	2.01 (0.94)	2.19 (0.87)
Accelerated	3.43 (0.86)	2.70 (0.92)	2.25 (0.98)	2.80 (1.03)
Total	2.98 (1.18)	2.83 (0.99)	2.29 (1.02)	2.72 (1.10)

Note: 5-point Likert scale (1= Not true / 5= Very true)

The results from the analysis of variance on the overall 'perceived uncertainty' has shown the main effect for the progress bars ($F(2, 242) = 31.93$, $p < 0.001$). The constant progress bar caused the lowest level of 'perceived uncertainty' among participants ($M = 2.19$, $SD = 0.87$) followed by the accelerated progress bar: ($M=2.80$, $SD=1.03$) and no progress bar conditions: ($M=3.28$, $SD=1.14$). According to Bonferroni test, there was found a significant difference between all three condition groups with p-values < 0.001 (hypothesis H1a, H1b).

Moreover, more 'perceived uncertainty' was examined among participants who were exposed to the no animation condition, while people who watched website with animation were uncertain less ($F(2, 242) = 21.67$, $p< 0.00$). Bonferroni test indicated the difference between no animation and hedonic animation conditions ($p< 0.001$), and between hedonic and functional animation conditions ($< 0{,}001$), while no difference was found between no animation and functional animation conditions ($p= 1.00$).

Finally, Figure 6 shows an interaction effect of the progress bar and animation on 'perceived uncertainty' ($F(4, 242) = 7.63$, $p< 0.001$). This finding indicates that the type of progress bar influences the level of people 'perceived uncertainty' only when no animation is used. However, once users are exposed simultaneously to the website with animated materials and progress bar, the progress bar type does not play anymore a significant role in improving the users 'perceived uncertainty' level.

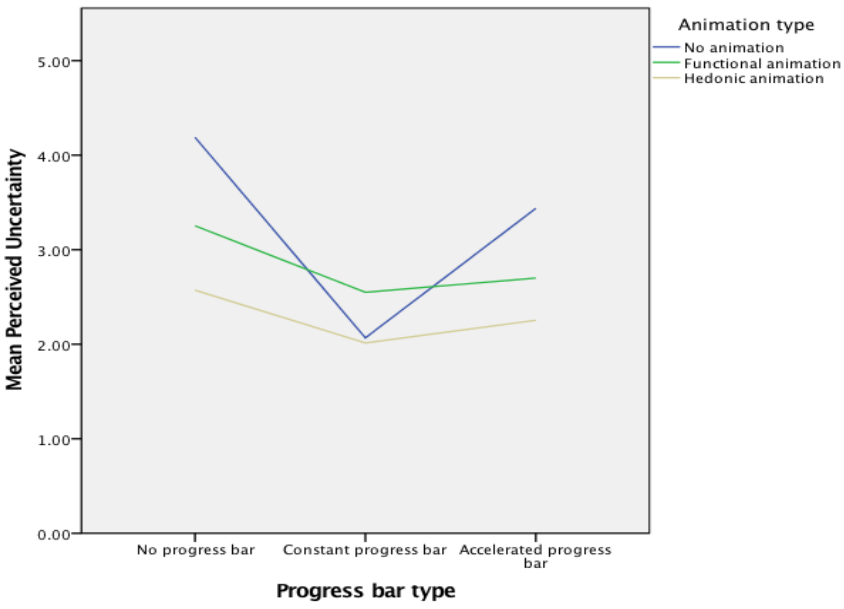

Figure 6. *Perceived uncertainty means as an interaction of progress bar and animation*

4.3 Focused Immersion

The hypothesis regarding the main effects on 'focused immersion' states that the presence of animation causes the lower 'focused immersion' on the waiting among participants compared to the condition without animation. In addition to this, it is expected that the hedonic animation will lead even to lower 'focused immersion' as compared to the functional animation.

Table 10. Means and standard deviations for focused immersion on a 5-point Likert scale

	Focused Immersion, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	3.96 (0.86)	2.92 (0.87)	2.60 (0.85)	3.11 (1.02)
Constant	2.85 (1.17)	2.87 (0.97)	2.47 (0.79)	2.76 (1.03)
Accelerated	3.44 (1.10)	2.84 (1.07)	2.26 (1.02)	2.85 (1.16)
Total	3.30 (1.17)	2.87 (0.96)	2.46 (0.89)	2.90 (1.07)
Note: 5-point Likert scale (1= Not true / 5= Very true)				

The main effect of animation on the 'focused immersion' was found ($F (2, 242) = 18.89$, $p < 0.001$). As it can be seen in Table 10, participants who were exposed to the website with hedonic animation appeared to have less "focused immersion', than people who watched functional animation. The highest 'focused immersion' was indicated among users, who observed a website without animation The results of Bonferroni test also showed the difference between all three experimental groups ($p < 0.001$). Furthermore, the main effect was found for the presence of progress bar ($F (2, 242) = 4.09$, $p= 0.018$). Bonferroni test indicated that people experienced less 'focussed immersion' with constant progress bar, than without progress bar ($p < 0. 001$).

Finally, the interaction effect of the progress bar and animation on the 'focused immersion' can be observed in Figure 7 ($F (4, 242) = 2.87$, $p= 0.024$). The interaction effect indicates that the progress bar type does not influence the level of 'focused immersion' when the progress bar is presented simultaneously with animated graphics. On the contrast, the speed mode of the progress bar type plays a significant role in manipulating the 'focused immersion' when no animation is exposed on the website.

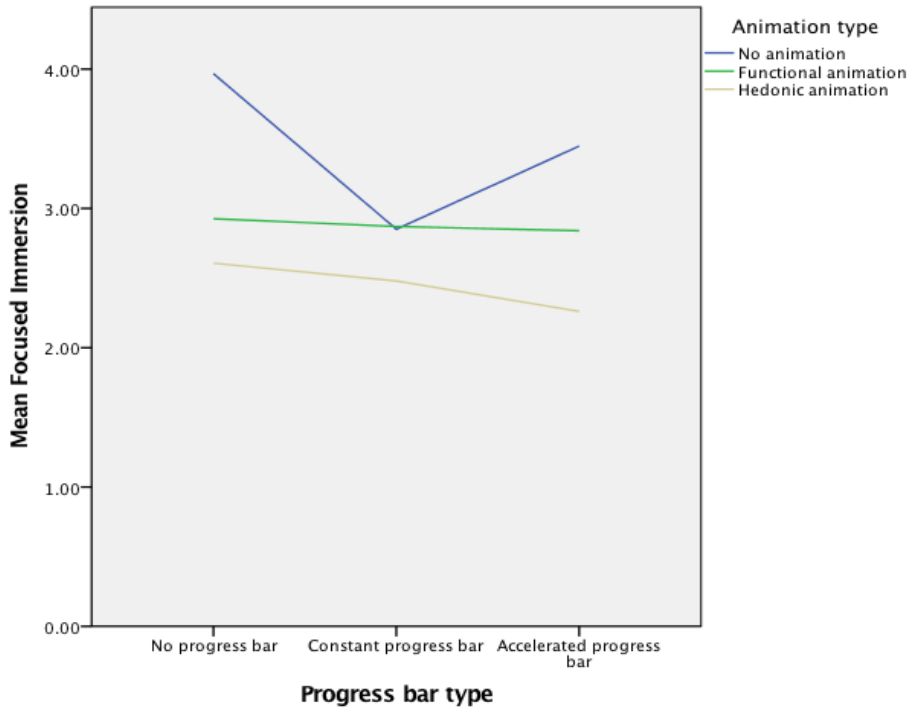

Figure 7. *Focused immersion means as an interaction of progress bar and animation*

4.4 Temporal Dissociation

The hypothesis about the main effect of animation on the 'temporal dissociation' claims that the presence of animation will produce higher 'temporal dissociation' as compared to the website loading page without animation. Additionally, it was assumed, that the hedonic animation will lead to even higher 'temporal dissociation' in comparison with the functional type of animation.

Table 11. Means and standard deviations for temporal dissociation on a 5-point Likert scale

	Temporal Dissociation, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	2.30 (0.95)	2.38 (0.91)	2.67 (1.20)	2.46 (1.04)
Constant	1.94 (1.01)	1.92 (0.92)	2.47 (0.82)	2.07 (0.96)
Accelerated	2.47 (0.98)	2.26 (0.76)	2.39 (1.17)	2.37 (0.97)
Total	2.17 (1.00)	2.18 (0.88)	2.52 (1.07)	2.28 (1.00)
Note: 5-point Likert scale (1= Not true / 5= Very true)				

No significant differences were examined on 'temporal dissociation' between the no animation and animated conditions ($F(2, 242) = 2{,}36$, $p = 0{,}096$). The mean scores of the different animated groups did not differ significantly, which indicates the no significant effect of the animation presence and its type on the 'temporal dissociation' of participants.

In line with the outcomes for animation effect, no significant effect was found for the influence of the progress bars on the participants' level of 'temporal dissociation' ($F(2, 242) = 2.73$, $p = 0.067$). Consequently, no interaction effect was found for the combination of the progress bars together with animated materials on 'temporal dissociation' ($F(4, 242) = 0.71$, $p = 0.589$). All mean scores, which are depicted in the table are almost equal, which states, that there is no difference for 'temporal dissociation' between condition groups.

4.5 Heightened Enjoyment

The results of ANOVA have shown that progress bar on the website page positively influenced on participants' 'heightened enjoyment' ($F(2, 242) = 4.25$, $p = 0.015$). The 'heightened enjoyment' of participants was higher when they observed the accelerated progress bar. Much less users enjoyed the waiting, when no progress bar was provided on the website page (Bonferroni test: $p < 0.001$). However, the mean difference between constant ($M= 2.38.$, $SD= 1.11$) and accelerated ($M= 2.46$, $SD= 1.84$) progress bars was not statistically significant, which was also supported by Bonferroni test ($p= 1.00$). These results indicate that the type of progress bar does not improve significantly users' level of 'heightened enjoyment'.

Table 12. Means and standard deviations for heightened enjoyment on a 5-point Likert scale

	Heightened Enjoyment, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	1.26 (0.38)	1.99 (0.80)	3.06 (1.25)	2.16 (1.16)
Constant	1.94 (0.86)	2.20 (0.92)	3.36 (1.13)	2.38 (1.11)
Accelerated	1.97 (0.73)	2.07 (0.64)	3.39 (1.47)	2.46 (1.84)
Total	1.77 (0.78)	2.08 (0.79)	3.26 (1.28)	2.33 (1.15)
Note: 5-point Likert scale (1= Not true / 5= Very true)				

On the other hand, the study results showed that users enjoyed waiting more, when they viewed the website with hedonic animation ($M= 3.26$, $SD= 1.28$) as compared to website with functional animation ($M= 2.08$, $SD= 0.79$). Additionally, the lowest level of 'heightened enjoyment' indicated participants who saw no animation on the website ($M= 1.77$, $SD= 0.78$). Thus, the main effect of animation on 'heightened enjoyment' is concluded ($F(2,242) = 55.01$, $p < 0.001$). The Bonferroni test showed the significant difference between all three condition groups ($p < 0.001$)

Finally, no interaction effect was found of the combination of the progress bar and animated graphics on 'heightened enjoyment' ($F(4, 242) = 0.79$, $p= 0.532$).

4.6 Perceived Waiting Time

'Perceived waiting time' was measured both with Likert-scale questions and the open question, in which respondents were asked to indicate in the amount of time in seconds they were waiting. The outcomes for means and standard deviations can be found in the tables below.

Table 13. Means and standard deviations for perceived waiting time on a 5-point Likert scale

	Perceived Waiting Time, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	1.31 (0.45)	1.79 (0.90)	2.54 (1.23)	1.92 (1.05)
Constant	2.21 (1.10)	2.16 (1.01)	2.98 (1.12)	2.39 (1.12)
Accelerated	1.80 (0.63)	2.30 (1.00)	2.89 (1.24)	2.32 (1.07)
Total	1.87 (0.92)	2.08 (0.98)	2.79 (1.20)	2.22 (1.10)
Note: 5-point Likert scale (1= Not true / 5= Very true)				

The ANOVA outcomes have shown the significant effect of the progress bar on 'perceived waiting time' ($F(2, 242) = 7.01$, $p = 0.001$). It was observed that users perceived time shorter, when they viewed the website with constant progress bar as compared to the no progress bar condition (Bonferroni test: $p = 0.015$). No differences ($p = 0.071$) were found between no progress bar and accelerated bar ($M = 2.32$, $SD = 1.07$) groups, and between constant and accelerated progress bars' types ($p = 1.00$).

Table 14. Means and standard deviations for perceived waiting time in seconds

	Perceived Waiting Time, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	81.30 (24.41)	61.00 (41.66)	50.36 (38.96)	63.17 (38.05)
Constant	59.19 (72.11)	49.33 (28.71)	36.04 (25.53)	50.35 (52.94)
Accelerated	56.75 (32.01)	68.28 (41.88)	56.30 (55.97)	60.61 (43.90)
Total	64.25 (54.25)	59.32 (38.13)	47.60 (41.92)	57.51 (46.09)

Next to this, the participants stated they were waiting the lowest amount of time with hedonic animation. After, users estimated the waiting time longer with functional animation, while the highest results for 'perceived waiting time' were indicated for no animation condition. Bonferroni test showed the significant difference between animation conditions ($p < 0.001$). Additionally, the mean scores (in seconds) for the open question (Table 14) show the longest waiting time for no animation ($M = 64.25$, $SD = 54.25$), followed by functional animation ($M = 59.32$, $SD = 38.13$) and hedonic animation ($M = 47.60$, $SD = 41.92$) groups. Therefore, a significant effect of animation type on 'perceived waiting time' ($F(2, 242) = 21.14$, $p < 0.001$) can be concluded.

Finally, no interaction effect on simultaneous usage of the progress bar and animation for 'perceived waiting time' was examined (F (4, 242) = 0.81, p= 0.519).

4.7 User Satisfaction

The study found the highest 'user satisfaction' among participants, who observed the website with the constant progress bar, while the lowest satisfaction was indicated for users in no progress bar group. These results state about the significant main effect of progress bar (F (2, 242) = 7.38, p = 0.001). However, the Bonferroni test indicated no significant differences (p = 0.071) between the no progress bar condition and the accelerated progress bar condition. No effect (p = 1.00) was also observed between the constant and accelerated progress bar groups.

Table 15. Means and standard deviations for user satisfaction on a 5-point Likert scale

	User Satisfaction, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	1.63 (0.54)	2.43 (0.96)	3.00 (0.92)	2.40 (1.00)
Constant	2.67 (1.02)	2.54 (0.91)	3.35 (0.79)	2.81 (0.98)
Accelerated	2.32 (0.76)	2.75 (0.64)	3.25 (1.11)	2.76 (0.92)
Total	2.31 (0.94)	2.57 (0.85)	3.19 (0.94)	2.66 (0.98)
Note: 5-point Likert scale (1= Not true / 5= Very true)				

Besides that, a significant effect was found for the animation presence and animation types (F (2, 242) = 24.81, p< 0.001). Users were satisfied the most with the website, designed with hedonic animation, while the lowest satisfaction was indicated among users who belonged to no animation group. A Bonferroni test showed that a significant difference exists (p< 0.001) between the no animation and the hedonic animation conditions. Moreover, the significant outcome (p< 0.001) was observed between the hedonic animation and the functional animation groups. Finally, no interaction effect was found when the progress bar was presented together with the animation materials (F (4, 242) = 0.81, p= 0.063).

4.8 Intention to Use

The last significant dependent variable of the research model is "intention to use'. 'Intension to use' is an important indicator for estimating whether the customer was not only satisfied with the service but also if he willing to come back to the website in the future when there are options to choose. The measuring of this variable helps to improve the customer service and increase the sales level.

Table 16. Means and standard deviations for intention to use on a 5-point Likert scale

	Intention to Use, M (SD)			
	No animation	Functional	Hedonic	Total
No progress bar	1.56 (0.45)	2.54 (1.23)	2.70 (1.08)	2.31 (1.10)
Constant	2.54 (1.16)	2.55 (1.11)	3.25 (0.91)	2.73 (1.12)
Accelerated	2.34 (0.81)	2.80 (0.93)	2.88 (1.27)	2.67 (1.03)
Total	2.23 (1.01)	2.62 (1.09)	2.93 (1.10)	2.58 (1.10)
Note: 5-point Likert scale (1= Not true / 5= Very true)				

Results of the study showed that users intended to use the website more when they were exposed to the progress bar ($F (2, 242) = 5.39$, $p = 0.005$). Constant progress bar led to the highest 'intention to use' among participants, while the condition without progress bar indicated the lowest mean score for this dependent variable Bonferroni test also showed the significant effect ($p= 0.039$) between the no progress bar ($M=2.31$, $SD= 1.10$) and the constant progress bar ($M=2.73$, $SD= 1.12$) conditions. At the same time, no difference was indicated between the constant and the accelerated progress bars ($p= 1.00$), and between the accelerated bar and the no progress bar conditions ($p= 0.123$).

Additionally, for the animation conditions the highest 'intention to use' was found when users viewed hedonic animation, while the lowest was observed for no animation group. These findings state about the main effect of the animation on 'intention to use' ($F (2, 242) = 11.53$, $p< 0.001$). However, the mean scores on 'intention to use' did not differ significantly between hedonic and functional animation types (Bonferroni test: $p= 0.236$) and between the no animation and the functional animation groups (Bonferroni test: $p= 0.059$).

Finally, the 'intension to use' the website did not differ significantly when the animation was presented together with the progress bar. Consequently, no interaction effect between the independent variables was found ($F (2, 242) = 1.79$, $p= 0.130$). Despite the difference is not statistically significant, the highest 'intension to use the website' was indicated for the simultaneous usage of constant progress bar together with the hedonic animation ($M= 3.25$, $SD= 0.91$).

4.9 Overview of Tested Hypotheses

Based on the results presented in the previous paragraphs the main effects for the progress bar and the animated graphics were found almost for all dependent study constructs. Furthermore, an interaction effect of the progress bar and animation was found for perceived

uncertainty and focused immersion. Therefore, the H11 study hypothesis is partly supported. The overview of all tested hypotheses and study results are depicted in Table 17.

Table 17. Overview of the tested hypotheses

	Hypothesis	Result
H1	H1a: Users feel less uncertain about an online waiting process when watching a webpage with a progress bar as opposed to a webpage without a progress bar.	**Supported**
	H1b: Users feel less uncertain about an online waiting process when watching a webpage with a constant progress bar as opposed to a webpage with an accelerated progress bar.	**Supported**
H2	H2a: In the online environment, users perceive waiting time shorter when watching a webpage with a progress bar as opposed to a webpage without a progress bar.	**Supported**
	H2b: In the online environment, users perceive waiting time shorter when watching a webpage with an accelerated progress bar as opposed to a webpage with a constant progress bar.	**Not supported**
H3	H3a: Users are more satisfied with a website when a progress bar is presented during the waiting process, as opposed to a website without a progress bar.	**Supported**
	H3b: Users are more satisfied with a website when a constant progress bar is presented during the waiting process, as opposed to a website with an accelerated progress bar..	**Not supported**
H4	H4a: Users' intention to use a website is higher when a progress bar is presented during the waiting process, as opposed to a website without a progress bar.	**Supported**
	H4b: Users' intention to use a website is higher when a constant progress bar is presented during the waiting process, as opposed to a website with an accelerated progress bar.	**Not supported**
H5	H5a: In the online waiting, users experience less focused immersion on the wait, when watching a webpage with animation as opposed to a webpage without animation.	**Supported**
	H5b: In the online waiting, users experience less focused immersion on the wait, when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation	**Supported**
H6	H6a: When waiting online, users experience more temporal dissociation, when watching a webpage with animation as opposed to a webpage without animation.	**Not supported**
	H6b: In the online waiting, users experience more temporal dissociation, when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation.	**Not supported**
H7	H7a: When waiting online, users experience more heightened enjoyment, when watching a webpage with animation as oppose to a webpage without animation.	**Supported**
	H7b: In the online waiting, users experience more heightened enjoyment, when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation.	**Supported**
H8	H8a: In the online environment, users perceive waiting time shorter when watching a webpage with animation as opposed to a webpage without animation.	**Supported**
	H8b: In the online environment, users perceive waiting time shorter when watching a webpage with a hedonic animation as opposed to a webpage with a functional animation	**Supported**

H9	H9a: Users are more satisfied with a website when an animation is presented during the waiting process, as opposed to a website without animation.	**Supported**
	H9b: Users are more satisfied with a website when a hedonic animation is presented during the waiting process, as opposed to a website with a functional animation.	**Supported**
H10	H10a: Users' intention to use a website is higher when an animation is presented during the waiting process, as opposed to a website without animation.	**Supported**
	H10b: Users' intention to use a website is higher when a hedonic animation is presented during the waiting process, as opposed to a website with a functional animation.	**Not supported**
H11	H: When waiting online, the positive influence of progress bar on the perceived uncertainty, focused immersion, temporal dissociation, heightened enjoyment, perceived waiting time, user satisfaction and intention to use is even greater with the animated graphics on the webpage.	**Partly supported**

5. Discussion

In this section, the results of the study will be discussed and elaborated further. Consequently, in the current chapter, the research question will be answered. In the following paragraph 5.1, the conclusions of this research will be investigated, followed by the limitations and suggestions for the future research in paragraph 5.2. Finally, in paragraph 5.3 the practical implications of this study will be presented.

5.1 Conclusions

Using the attentional gate model and the cognitive absorption theory, the central question of this study was to determine whether temporal (i.e., progress bar) and distractor (i.e., animation) cues on the website loading page affect people's wait process and user satisfaction overall. This section presents conclusions on whether a progress bar and animation had a significant impact on people's wait process estimation, user satisfaction, and intention to use and whether it confirms the assumed study hypotheses.

The proposed theoretical model has assumed that **the progress bar** would reduce users' perceived uncertainty and perceived waiting time in the online environment. The impact of the progress bar on user's uncertainty was expected, as the attentional gate model postulates. The model assumes that the gate can close because users, who watch the progress bar, do not need to follow the passage of time anymore (Zakay & Block, 1995). The study outcome shows that participants uncertainty level differs significantly when they watch the progress bar on the webpage and when the progress bar is not provided (H1a). This means that providing wait duration information to customers helps to reduce their uncertainty level by enhancing personal control over the waiting process (Hui & Tse, 1996). Furthermore, different speed modes of the progress bar affect users' uncertainty differently. This study indicates that the constant progress bar results in lower uncertainty than the accelerated progress bar (H1b). Thus, customers are feeling less uncertain when the information about waiting is more determined (Osuna, 1985). The constant speed mode of the progress bar closes the attentional gate to the waiting process and makes wait comfortable and less stressful. Thus, the more precise estimation about waiting time users can make, the more confident they feel.

As mentioned, the study also expected to find the main effect of the progress bar on perceived waiting time. It was found that the presence of the progress bar on the website page resulted in shorter subjective waiting duration estimation than when participants did not see the progress bar while waiting (H2a). Despite the attentional gate model's claim that the temporal task keeps people involved in the waiting process and opens the attentional gate (Zakay &

Block, 1995), this study found the opposite. An explanation could be that people feel more confident about waiting with the progress bar and as a result estimate the time shorter. The previous research has shown that people with a higher self-control estimate waiting time shorter because they feel more relaxed and less stressed about the time (Harrison, 2010: Lee, Chen & Hess, 2017).

However, no significant difference was found between the constant and the accelerated progress bar on perception of waiting time. Thus, the study hypothesis H2b cannot be supported. These results are different from the previous research outcomes, which concluded that the accelerated progress bar leads to shorter time estimation compared to the constant moving progress bar (Harrison, 2007; Harrison, 2010; Hohenstein, 2016). A possible explanation can be derived from the speeding mode of the accelerated progress bar. Since it moves much slower at the beginning than at the end of the loading process, users may perceive it as a system delay, thus seeing the time duration as longer than it is in reality. Overall, the current study has shown that temporal information depending on its design features can successfully manipulate users' uncertainty level and perception of wait duration.

Moreover, it was hypothesized that the presence of the progress bar on the waiting page would cause higher user satisfaction and intention to use the website again. This assumption was supported, and the main effect of the progress bar was found. This outcome indicates that users are in need of a progress bar when they wait online because they perceive this temporal information as a valuable and task-relevant website element (Sam & Tahir, 2009; Qutaishat, 2012; Nusair, 2008). Consequently, their satisfaction levels and intention to use this website again are significantly higher as compared with the site without the progress bar. Additionally, previous research claimed that users prefer a constant system response, which makes people think that the system is working efficiently and correctly (Scheiderman, 1998; Hoxmeier & DiCesare, 2000). Thus, it was also expected that users would be more satisfied and intend to use a website with the constant progress bar more often than one with the accelerated progress bar. However, no expected difference was found for the users' satisfaction between progress bar types. Consequently, it seems as though users are already satisfied with the presence of a progress bar, regardless of what kind. Therefore, one can conclude that the speed mode of the progress bar does not influence the users' evaluation of the website.

Furthermore, this research investigated how the presence **of animated materials** on the website loading page will influence the cognitive absorption variables—namely, focused immersion, temporal dissociation, and heightened enjoyment. The attentional-gate model postulates that animated cues have the potential to attract users' attention and make them less

involved in the wait (Zakay & Block, 1995). Accordingly, users experience cognitive absorption and concentrate much less on the waiting process itself (Agarwal & Karahanna, 2000). Firstly, the previous research has shown that animated materials in the online waiting context capture a lot of human's attentional resources and produce less focused immersion on the wait. With respect to previous findings, the results show that customers experience lower focused immersion on the wait when a website has animation than when the animation is not presented (H5a). Next to this, as expected, the study found that hedonic animation created an even smaller process of focused immersion on the wait than a hedonic one (H5b). Thus, participants were thinking less about the time when they saw animated hedonic materials on the website. This finding supports an idea that emotion-provoking animation catches a higher amount of attentional resources, closes the attentional gate, and makes people forget about the wait (Agarwal & Karahanna, 2000; Nisbett & Ross 1980).

Secondly, it was proposed that users who watch a website page with animation experience a high temporal dissociation, as suggested by Agarwal and Karahanna (2000). Temporal dissociation occurs because the attentional gate closes when animated material catches users' attention, making people lose the sense of physical time (Zakay & Block, 1995, Lee, Chen & Ilie, 2012). However, the effect of animation was not strong enough to generate the process of temporal dissociation. Also, no significant difference was examined between hedonic and functional animation types. As a result, the H6a and H6b study hypotheses were not supported. This outcome contradicts assumptions of the attentional gate model. According to it, exposing people to animated visuals helps close the gate and generates the process of temporal dissociation (Zakay & Block, 1995; Agarwal & Karahanna, 2000; Maister, 1985; Lee, Chen, & Ilie, 2012; Lee, Chen, & Hess, 2017). A possible explanation for these outcomes is the animation design, which is not probably complex and complicated enough to dissociate people from the time passage, making them still think about timing while waiting. Moreover, an explanation can be derived from the nature of the laboratory experiment, where people, no matter what they see or do, still think about the experiment time duration because of the artificial situation settings, thus continuing to pay attention to the time duration.

About heightened enjoyment, the results showed that users especially enjoyed the waiting process when they were presented with animation on the website page (H7a). Furthermore, the animated graphic about the coffee-making (i.e., hedonic animation) resulted in even higher heightened enjoyment among participants than the moving animated dots (i.e., functional animation). H7b is therefore accepted, which allows the claim that hedonic

animation attracts more attention, triggers more excitement and fun, and thus closes the attentional gate and distracts people from waiting.

Besides that, the study found a significant effect of the animation's presence on perceived waiting time, which means that hypothesis H8a is accepted. This outcome is in agreement with the previous research, which had emphasized that because animation has a high potential to shift the users' attention from waiting, it helps to shorten the perceived wait duration (Nielsen, 2000; Diao & Sundar, 2004). Furthermore, participants who looked at hedonic animation estimated the time duration to be shorter than those who watched functional animation (i.e., H8b is accepted). This finding supports a previous idea that 'time flies quicker' when users enjoy the waiting and feel positive emotional arousal (Norman, 2002; Janiszewski, 1998). That is why emotionally-provoking animated graphics lead to the higher positive affective state, which creates the illusion of a shorter waiting time among its users (Nisbett & Ross,1980; Ravaja, 2004).

Finally, the findings show that animation and its types have a substantial effect on user satisfaction and intention to use the website again. This result is consistent with previous research, which indicated that the animated graphics on the website interface is a robust strategy for increasing the user's satisfaction and intention to use the website (Schaik & Ling, 2008; Venkatesh, 2000). Consequently, the study hypothesis is supported. Thus, it can be concluded that web developers can successfully manipulate the user's satisfaction with emotionally-arousing and aesthetically-pleasant animated graphics. Such a type of animation can help to increase the user's desire to visit the website again (Schenkman & Jonsson, 2000; Tractinsky, Katz & Ikar, 2000; Green & Jordan, 2002).

At last but not least, the study outcomes indicated **an interaction effect** of temporal information and distractor cues. It was found that when a progress bar and animated graphics were presented simultaneously on the website page, the perceived uncertainty of participants was much lower. This result suggests that the benefits of the combination of temporal and distractor design elements are especially significant in lowering the users' uncertainty. The possible explanation is that providing users with both informational content (i.e., a progress bar) and entertainment design (i.e., animation) while they are waiting helps them not only control the waiting process but also feel entertained. According to the attentional-gate model, these two factors can close the gate and significantly reduce the uncertainty level (Zakay & Block, 1995).

Furthermore, an interaction effect between the progress bar and the animated visuals was also indicated on users' focused immersion. Results of the study claim that the participants'

focused immersion was even lower when the temporal and non-temporal information were presented at once. Therefore, even though providing users with animation on the website page while they are waiting is already sufficient, adding the progress bar to the graphic is even better for manipulating individuals' focused immersion. One possible interpretation is that the progress bar, by its design characteristics, is also a sort of animation. Therefore, the combination of two animated distractors, at the same time, attracts even more of the users' attention and, according to attentional gate model, shifts their cognitive resources from wait estimation while producing a process of lower-focused immersion.

Interestingly, the found interaction effect for mentioned dependents variables indicated that the type of progress bar matters when the animation is not provided. At the same time, when users are exposed to animation during the online wait, the progress bar type does not add an extra value anymore. These findings provide web developers with a practical insight when its' worth to focus on the additional design features of temporal information while developing a website.

Furthermore, previous research provided evidence to assume an interaction effect of temporal and distractor cues on heightened enjoyment (Lee, Chen & Hess, 2017). Moreover, Liikkanen and Gomez (2013) also claimed that the combination of progress indicators with graphic materials is an efficient way to amuse users. However, the current study did not find significant evidence of interaction effect on heightened enjoyment. Consequently, it cannot be concluded that the presence of animation on the website loading page causes higher heightened enjoyment when it is combined with the progress bar. The possible explanation is that single, well-designed graphical elements do not need the additional graphical support of other features. As it was concluded in previous research, 'the more does not always mean better,' and as soon as the users' cognitive absorption resources are involved into the enjoyment process, no additional elements are required (Lee, Chen, & Ilie, 2012). Even though a further investigation of current findings needs to be done, current outcomes serve as a recommendation to web developers to think about combining two types of cues in the online wait.

5.2 Limitations and Suggestions for Future Research

There are some study limitations that should be taken into consideration when interpreting current results and providing suggestions for the future research on this topic. Firstly, this study may lack external validity due to the nature of experiment settings. The controlled laboratory experiment was conducted to examine the individual difference of waiting experience and user

satisfaction. Due to the artificial scenario situation, the generalization of the current study is concerned. Consequently, it would be recommended for future research to investigate the case of the online-waiting process with actual customers, when they are facing with real online food or drinks ordering. Thus, it would be insightful for future research to investigate real-life waiting process to strengthen the generalizability of the current results.

In this study, the progress bar and animation materials were only used to examine the users' waiting experience. The accent was made on the speeding mode of the progress bar and the type of animation. While only one characteristic of each dependent variable was examined, one should also take into the consideration other progress bar and animation design features. Moreover, there are many other forms of temporal and distractor information in an online environment, that can significantly influence the waiting experience. Thus, it is a topic for future research to investigate the variety of design factors that affect waiting process.

In the current experiment, users performed only an internet coffee purchase and waited online for their drink. Although this task is a good example of an online wait, it would be worth knowing to examine different waiting contexts and assignments (e.g., sending email, programs installation, downloading games or waiting in the online queue) and see whether the current theoretical model is generalized to other online wait situations.

Another suggestion for future research would be to focus on the different waiting time duration. In the current study, the controlled waiting time was 60 seconds for all experimental scenarios. This timing, according to Nah (2004), is considered to be a long timing duration of the online environment. Thus, it would be essential to investigate shorter waiting time and check whether it will have different outcomes. In addition to this, there may be a need to examine the users' estimation of waiting time in relation to 'expected-actual' time duration. In the current experiment, the participants were not told how long they need to wait, and it might be insightful to manipulate the given information about the waiting time.

To conclude, this study critically examined a waiting experience in the online environment through the manipulation of temporal and distractor cues on the website interface. Despite the fact that, some study hypotheses were not supported, the results serve as the essential background to study the online waiting in future.

5.3 Practical Implications

While the results of the current study can contribute to the scientific and research field, these outcomes can also be used in the e-commerce and web-developing business areas, as

possible recommendations for usage of temporal and distractor materials on the website interfaces. First of all, it can be concluded that online waiting experience and perception about waiting time can be significantly influenced by applying to different distractor types on the website. Therefore, companies should pay attention to which information present to users, when they are waiting online.

Moreover, the study results indicate, that providing users with temporal and distractor cues when they are waiting is significantly more beneficial, than not presenting any additional information concerning perceived uncertainty, focused immersion, heightened enjoyment and perceived waiting time. This finding is a significant consideration for web-developers that supports the idea of implementing feedback and distractor information when waiting is happening online.

Additionally, the results provide information about how different types of animation can significantly differ in manipulating the users' waiting experience. Therefore, it is recommended to use more emotionally-provoking and hedonic animated materials to benefit better for users' focussed immersion, heightened enjoyment and the time perception. The web designers should create good quality animation, with elements of the story-telling, which will involve users' in the story presented in animation, making them forget about waiting and enjoy more their waiting experience.

Furthermore, our findings, regarding perceived uncertainty displaying the constantly moving progress bar on the website page works significantly better than the progress bar, which accelerates or changes its speed while waiting. This means, if e-commerce wants to provide its consumers with temporal feedback about their purchases, better is to use precise real-time information so that users can have complete control over the waiting and make accurate time estimations.

Our findings of the interaction effects suggest that 'the more is not always better.' The study results suggest that the combination of temporal and distractor information has a significant effect on reducing the users' perceived uncertainty, while does not affect other wait perceptions. Consequently, it can be said that combining distractors enhances users' waiting experience but still more research is needed to increase the understanding how to compound different information from web-design prospective to get more significant manipulated effect.

Finally, with a purpose to increase overall users' satisfaction and intention to use the website again, e-commerce business should pay attention to the website design content and the quality of provided information. The study outcomes show a significant effect on the presence of progress bar and animation on the website for influencing the user experience. Consequently,

designing the website properly, with consideration of users' online tasks and personal needs, can essentially profit to user satisfaction and make them use the online service lately again.

Overall, in this study it was found that the process of online waiting can be manipulated by applying to different information types on the website interface. Hence, the web-developers and e-business owners should spend more efforts and invest more resources in developing good quality web-information. Websites should be well-designed to stimulate positive users' waiting experience, which consequently will show a direct connection to increasing of website traffic level and boosting of online purchasing.

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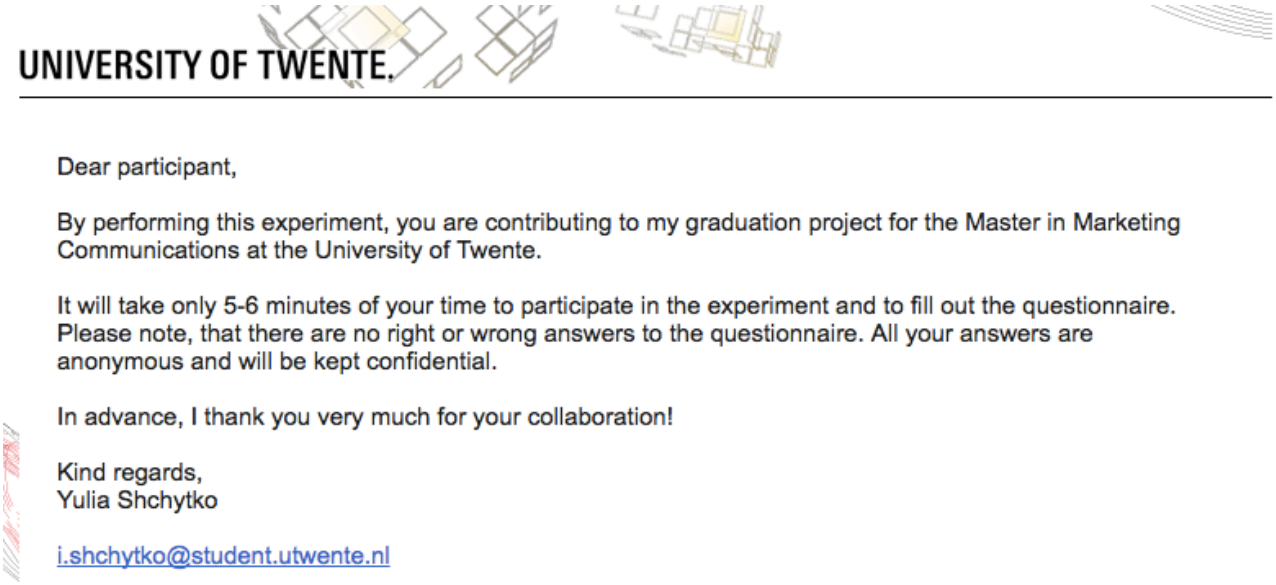
Appendix

Appendix A – Materials

Welcome message questionnaire:


UNIVERSITY OF TWENTE.

Dear participant,

By performing this experiment, you are contributing to my graduation project for the Master in Marketing Communications at the University of Twente.

It will take only 5-6 minutes of your time to participate in the experiment and to fill out the questionnaire. Please note, that there are no right or wrong answers to the questionnaire. All your answers are anonymous and will be kept confidential.

In advance, I thank you very much for your collaboration!

Kind regards,
Yulia Shchytko

i.shchytko@student.utwente.nl

Next

Scenario introduction:


UNIVERSITY OF TWENTE.

First of all, you are introduced to a short description of a life-situation in the combination with link to the website. Please read first the text below, and after please follow the link to the website to observe the materials.

Scenario:
"Imagine you are busy in the library on finishing one of the assignments. Feeling, that you get tired you want to drink a cup of coffee. However, you run out of time, and you decide to order the coffee online on the cafe website. Accordingly, after ordering, the coffee will be delivered to you to the place where you study."

Consequently, now please go the website (link is displayed below) to process the order of your coffee. After you finish the required actions on the website, please come back to this survey page to fill out the questionnaire.

Link to the website: http://thecoffeetwente.tk/b.html

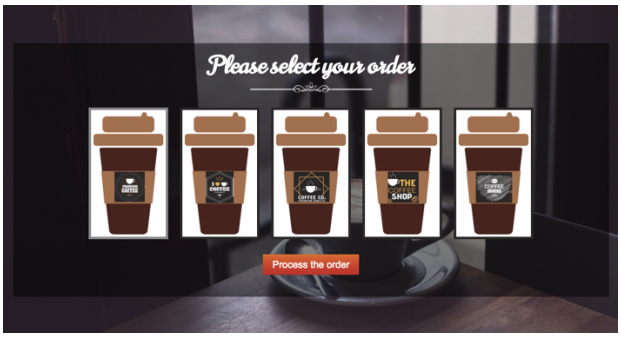
Please, click "Next" to fill out the questionnaire.

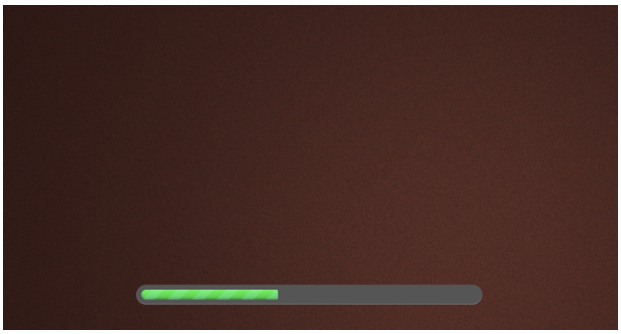
Next

Links to the study experimental scenarios:

Scenario 1	http://thecoffeetwente.tk/a.html
Scenario 2	http://thecoffeetwente.tk/b.html
Scenario 3	http://thecoffeetwente.tk/c.html
Scenario 4	http://thecoffeetwente.tk/d.html
Scenario 5	http://thecoffeetwente.tk/e.html
Scenario 6	http://thecoffeetwente.tk/f.html
Scenario 7	http://thecoffeetwente.tk/g.html
Scenario 8	http://thecoffeetwente.tk/h.html
Scenario 9	http://thecoffeetwente.tk/i.html

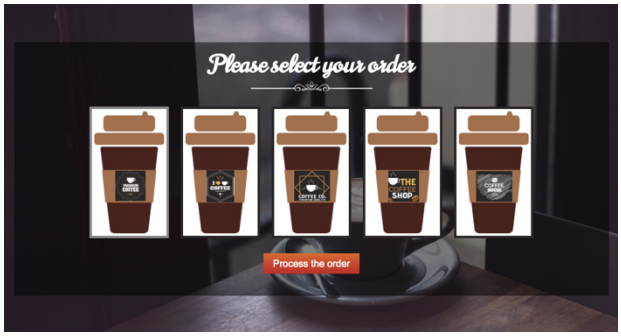
Condition with progress bar only:

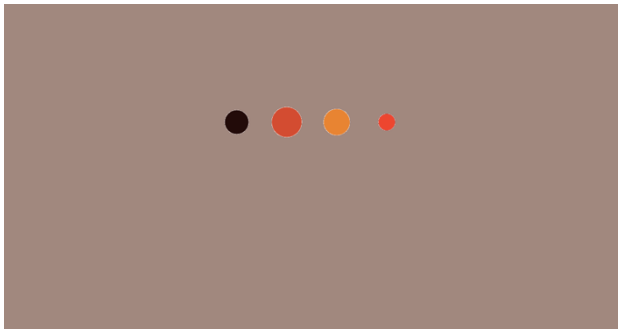




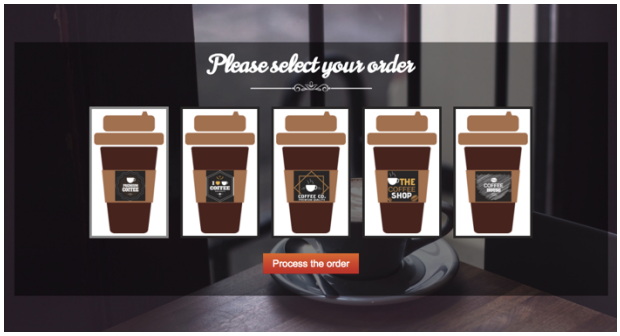
Conditions with animation only:

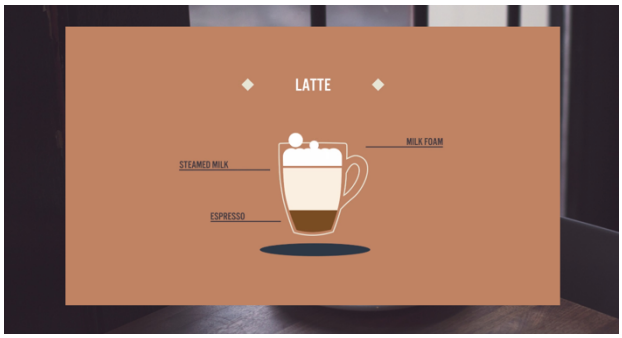
Functional animation condition





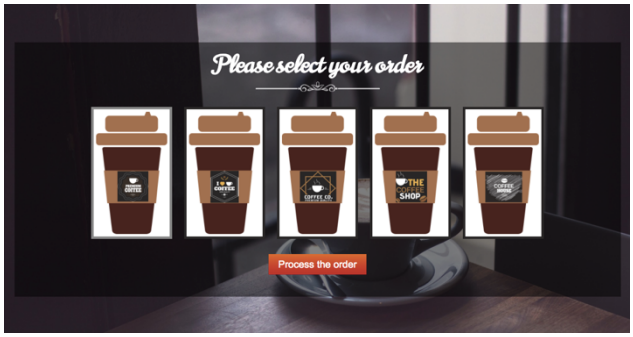
Hedonic animation condition

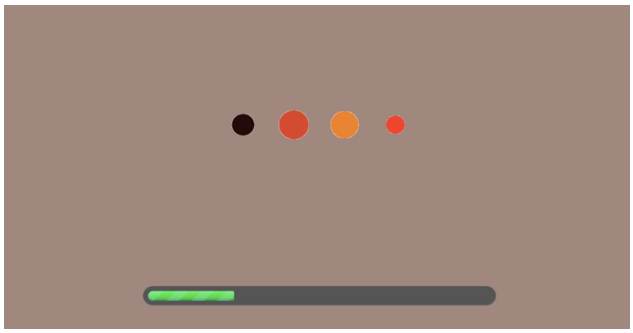




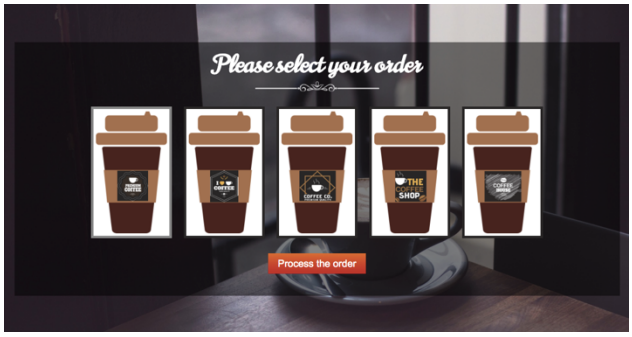
Conditions with progress bar and animation:

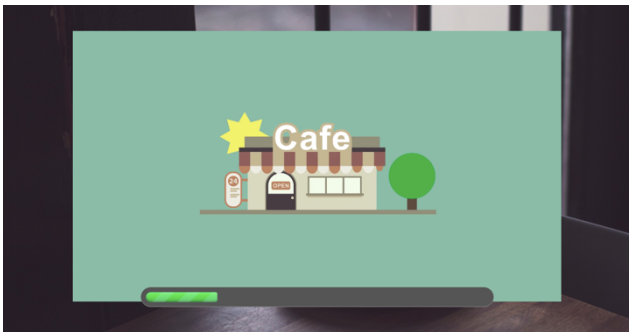
Progress bar and functional animation



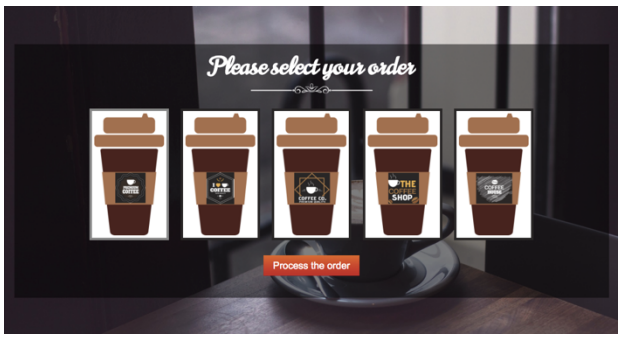


Progress bar and hedonic condition

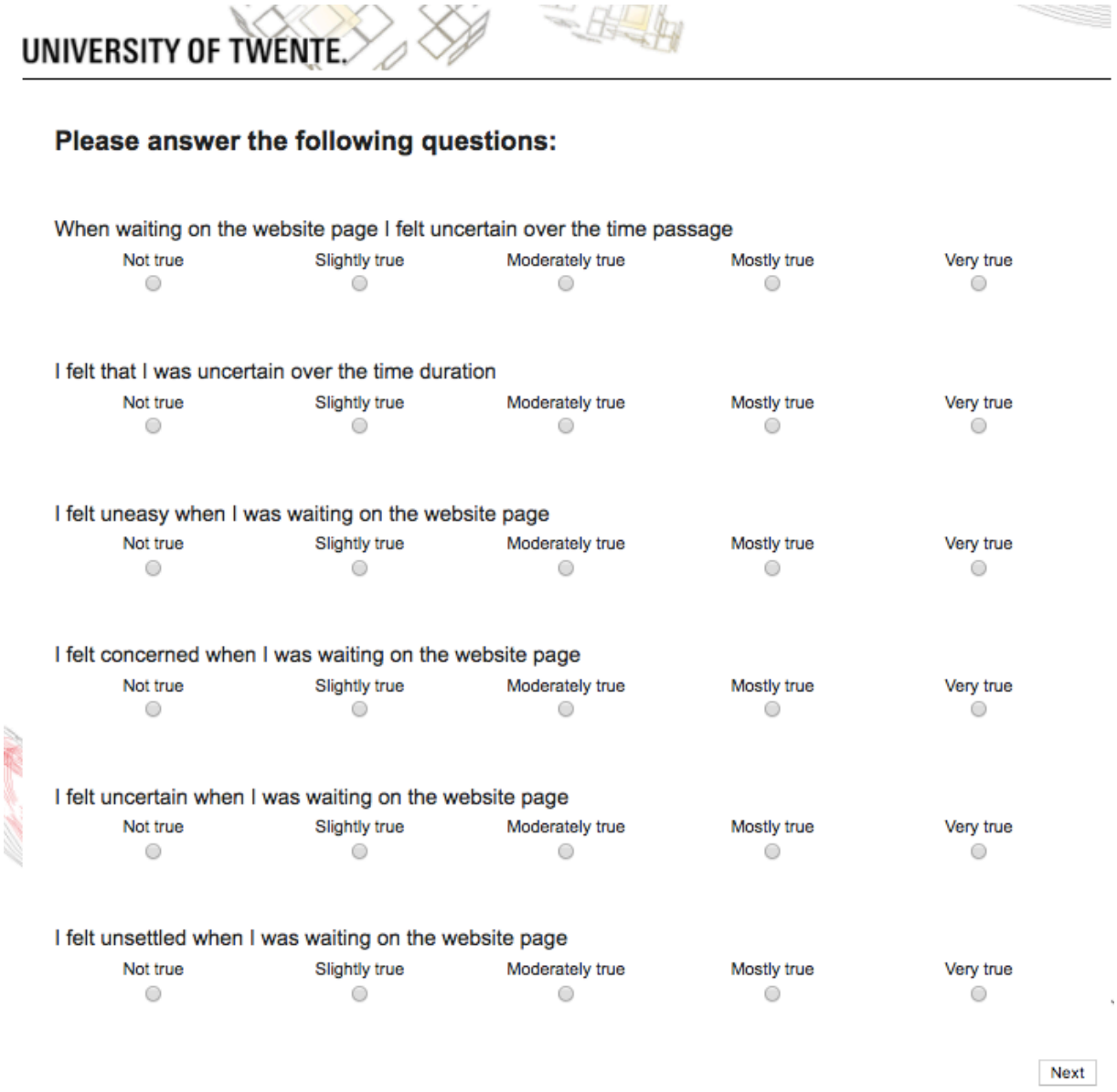




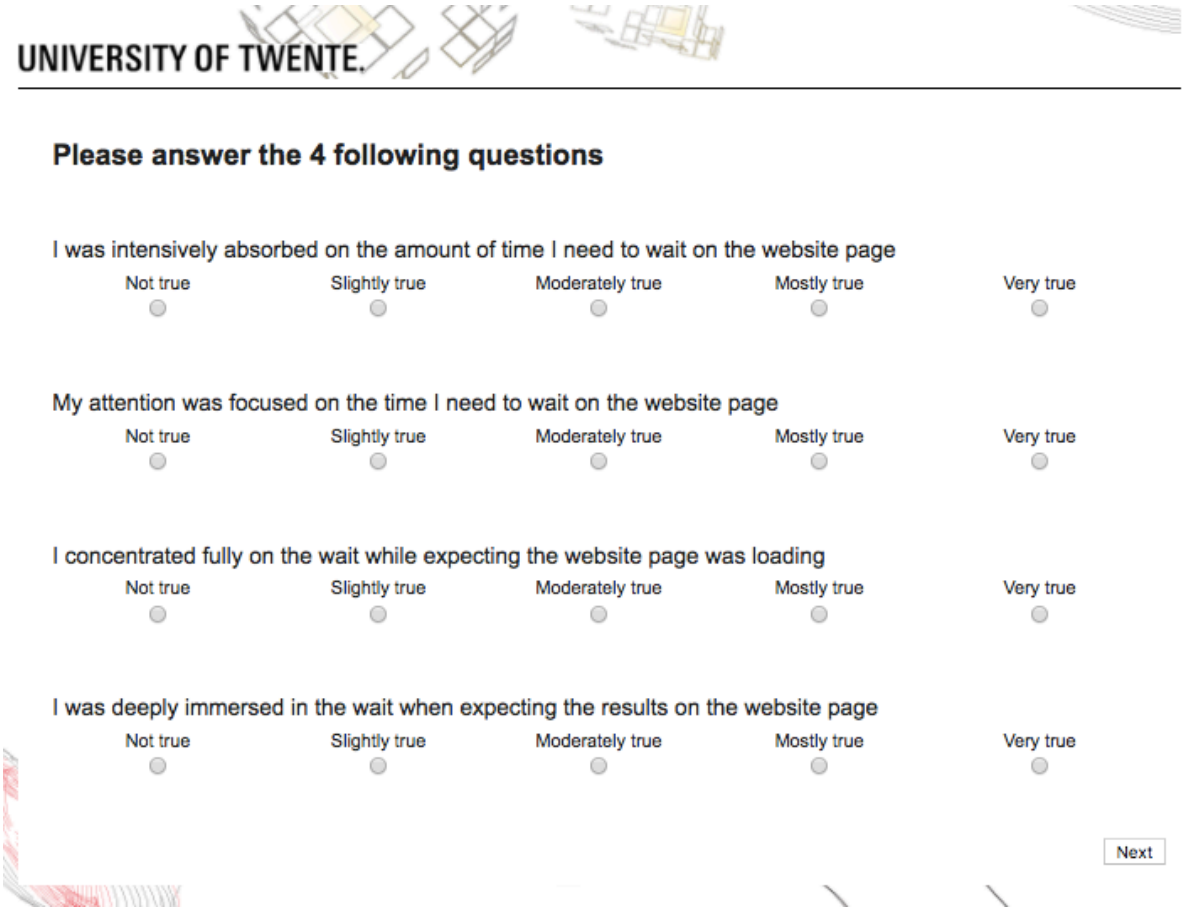
No animation and no progress bar group:



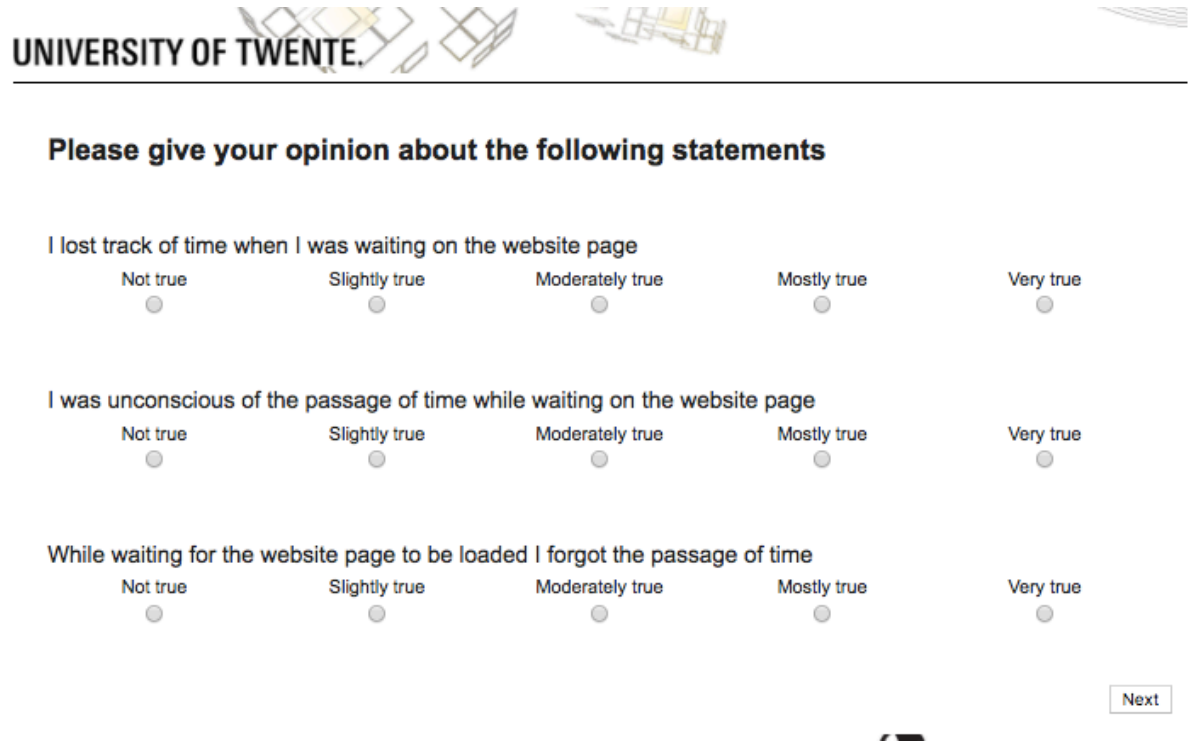
Questions for 'perceived uncertainty':



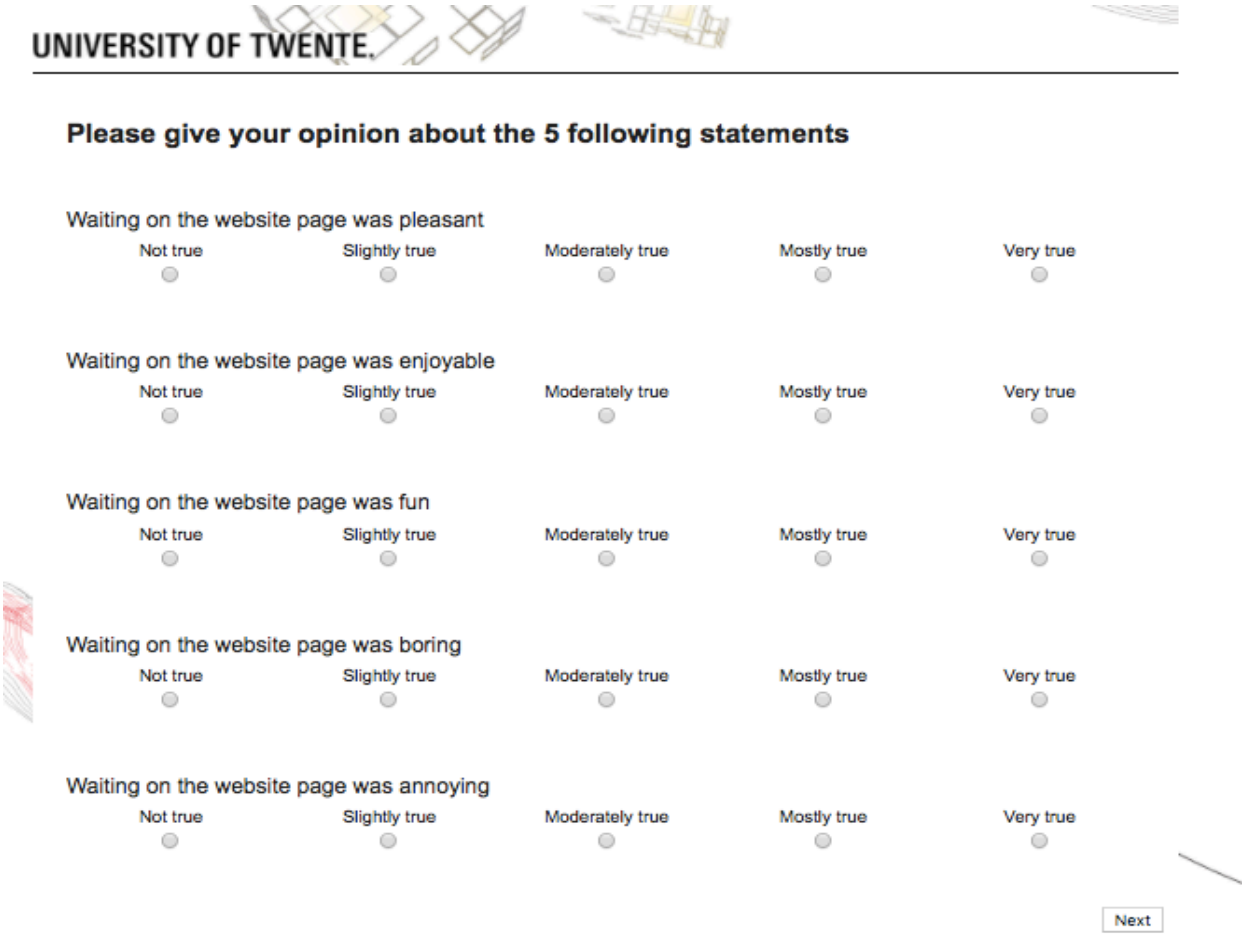
Questions for 'focused immersion':



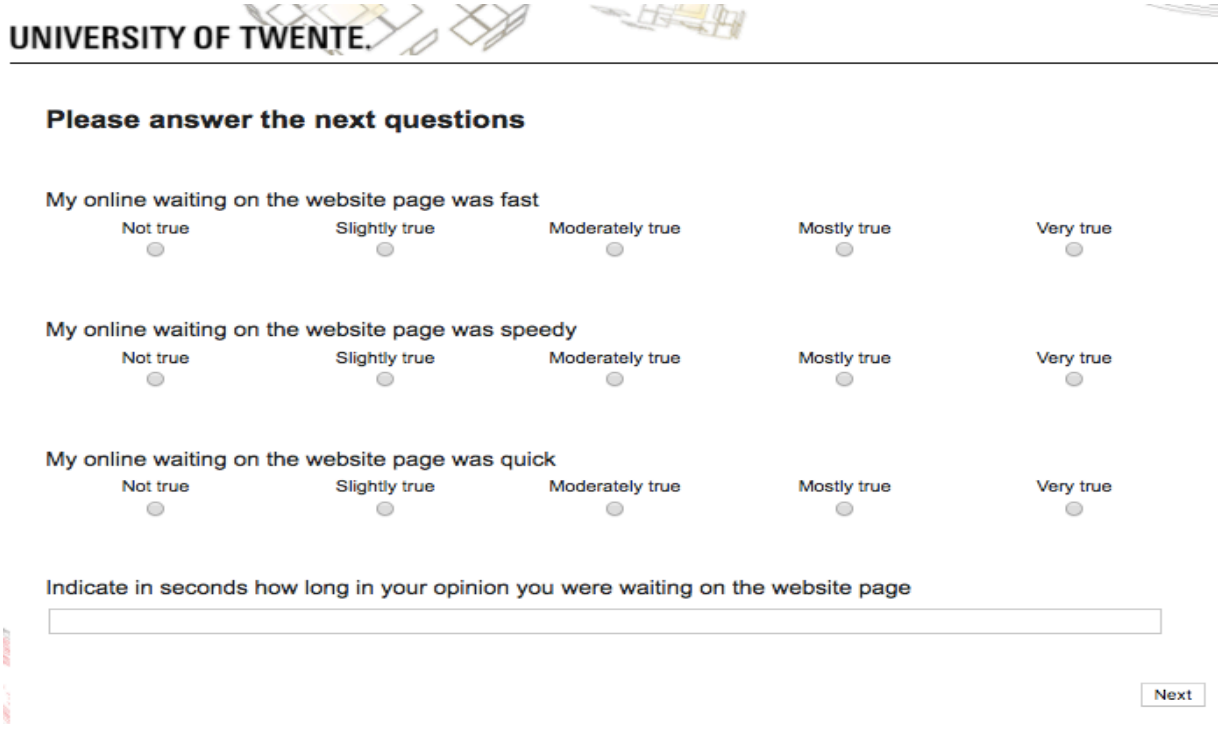
Questions for 'temporal dissociation':



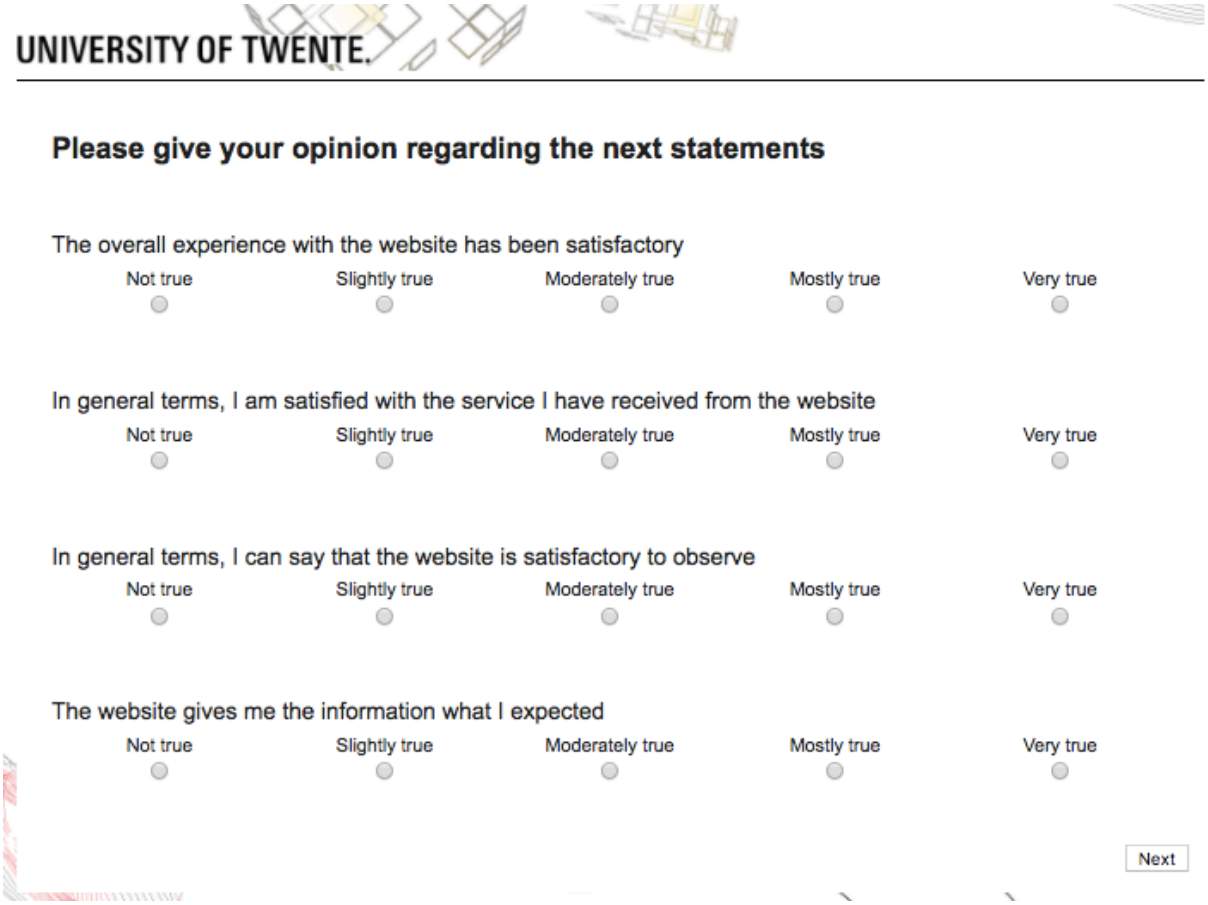
Questions for 'heightened enjoyment':



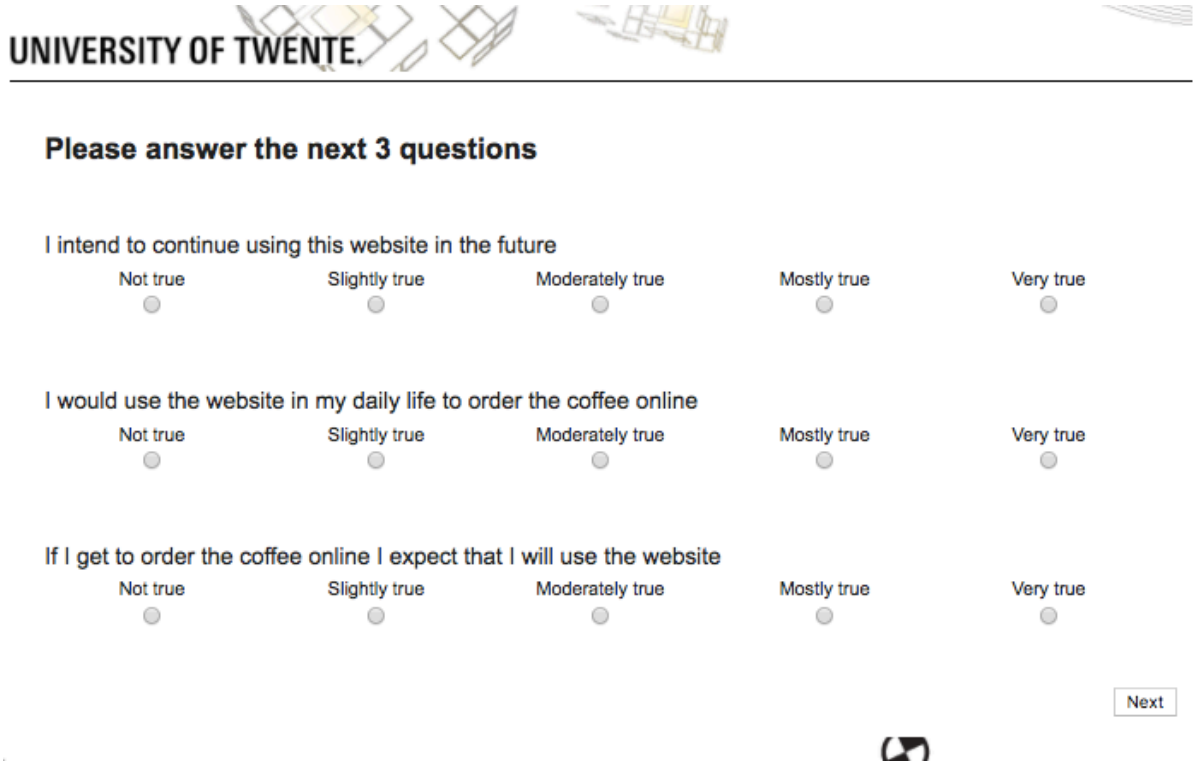
Questions for 'perceived waiting time':



Questions for 'user satisfaction':



Questions for 'intention to use'



Demographic questions: