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The role of familiarity while using a customer account interface.

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Abstract

Familiarity is an element that can significantly influence user experience. However, this subject is filled with gaps in the current literature, whether we are looking at it from a methodological perspective or from a theoretical perspective. This thesis therefore attempts to reduce the existing gaps by proposing a new methodology with existing and new variables to better understand this subject. We are using physiological tools to have a more precise understanding of user experience, and we are using variables that are not used in most research and if so, not in a similar context. Despite a lack of significant results in this study, suggestions for future research are being presented.

Key words: Familiarity, physiological measures.

Research method: User evaluation, facial expression analysis, oculometry, self-reported measures, observational measures, electrodermal activity, satisfaction, reuse intention, intention to recommend.

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List of Abbreviations and acronyms

UX: User Experience

REB: Research Ethics Board

NSERC: National Sciences and Engineering Research Council of Canada

HCI: Human Computer Interaction

WOM: Word-of-mouth

NPS: Net Promoter Score

K coef: Coefficient K

St. Dev.: Standard Deviation

CSAT: Customer Satisfaction

EDA: Electrodermal Activity

G1: Group 1

G2: Group 2

N: Number

P: p-value

DV: Dependant variable

STDErr: Standard Error

Probt: Probability

DF: Degrees of Freedom

Foreword

Approval of thesis - This thesis in User Experience (UX) in a business context has been submitted with the approval from the Academic Affairs office of the Master of Science (M.Sc.) program.

Co-authors consent - All co-authors of this thesis have provided their consent to be included in this thesis.

Competing interests - The author certifies to have no affiliations or involvement with any organization with any financial or non-financial interest in the subject matter or materials of this manuscript.

On a more personal note, I would like to start by thanking my family for all their support throughout my entire education.

Still on a personal note, I would like to thank my girlfriend for all her support, my friends for changing my mind every once in a while, and my roommate for all the moments we had together.

Introduction

Context

One of the key themes that will continue to transform society and industry in the not-too-distant future is the virtualization and digitalisation of services (Kuyumdzhiev & Petrov, 2024). Companies, therefore, need to adapt to this transition as best as possible. The goal is to improve customer service and, therefore, establishing a long-term relationship with customers (Ayanso & Lertwachara, 2015). Online services for customer have become an important tool of online marketing and a basic part to exhibit the enterprise and to interact with visitors (Huang et al., 2019). It has become more and more important to be able to offer a good experience to customers. Many factors influence online service quality and customer satisfaction: accessibility, reliability, ease-of-use, availability, interactivity, responsiveness, efficiency, security, and privacy have a significant influence on perceived online customer service quality (Huang et al., 2019). However, only very little research focuses on customer's specificity that influence their experience on online services.

The experience of users with technology is affected by their familiarity (Yu et Al., 2022). Familiarity can be defined as the level of knowledge or the sense of comfort and confidence with something and can be viewed as a complex understanding, which is often based on previous interactions, experiences, and learning from others (Yu et Al., 2022). Various factors affect familiarity, such as prior experience, repeated exposure, level of processing, and forgetting rate (Yu et Al., 2022). It is expected that familiarity with a website can have a significant impact on navigation (Yu et Al., 2022).

Research Questions

Existing work on observing familiarity with interactive systems has relied on surveys and self-reporting, which is prone to biases (Yu et Al., 2022). This research has three stated objectives. First, to propose an approach based mostly on physiological data to avoid biases associated with self-reported data while observing the interaction with the interface. Second, to better understand the role of familiarity in user experiences by analysing variables that have not been considered yet in the study of this topic or that have been considered but in different contexts such as familiarity with music, languages, Third, to observe how the variables associated with familiarity will influence other variables such as satisfaction and future behaviours.

This research introduces a physiological data collection with the implicit measurement of emotional valence, emotional arousal and exploratory gaze behaviour using respectively facial expression recognition, electrodermal activity and oculometry. Thus, to reach the previously mentioned objective, this research aims at answering the following research questions:

RQ1: To what extent does familiarity influence user's emotions?

RQ2: To what extent does familiarity influence user's behaviour, more specifically, the exploratory gaze behaviour and the completion time?

RQ3: To what extent does the emotions, exploratory gaze behaviour, and completion time influence the satisfaction of users, and their future behaviours related to the used service?

Contribution

From a methodological standpoint, this thesis tried to contribute to propose an approach to better understand the consequences of familiarity by using physiological data rather than self-reported data exclusively.

From a theoretical standpoint, this research attempt to contribute to the current literature by offering an approach using variables that have not been used in the current context such as emotions, exploratory gaze behaviour and or performance.

Methodology

We started this thesis by conducting a literature review to identify gaps in the existing research.

We then conducted a study to answer the previously formulated research questions. This experiment was conducted at the Tech3Lab of HEC Montréal (Canada). A total of 31 participants partakes in our study.

After consenting to the study, participants were presented a Qualtrics survey with questionnaires and tasks. During the tasks, we also collected physiological data such as facial video for emotional valence, electrodermal activity for emotional arousal, and oculometry for the exploratory gaze behaviour. We also used observational data such as completion time.

Thesis structure

The structure of this thesis is as follows: Chapter 1 presents a literature review and hypotheses formulation and the development of the theoretical model. Chapter 2 is dedicated to a detailed description of the study's methodology. Chapter 3 present the obtained results, while Chapter 4 discusses these results.

Student contributions and responsibilities

This thesis was written in the context of user tests realized in the Tech3Lab of HEC Montréal (Canada). The following table provides an overview of the student's contributions across all phases of this thesis, as well as other parties' contributions. The percentage of student involvement and input is detailed for each step of the process.

Table 1: Student contributions and responsibilities in this thesis.

Stage in the process	Contribution
Research question	Identified gaps in literature to define the research problem and its implications. [90%] - Problematic conceived by the student with the recommendations of the thesis supervisor (Sylvain Sénécal). - Hypotheses elaborated by the student with the recommendations of the thesis supervisor (Sylvain Sénécal).
Literature review	Conducted the relevant search and thorough scan of scientific articles to understand the current body of academic knowledge on familiarity. [100%]
Experimental design	Application to the Research Ethics Board (REB) of HEC Montréal. [5%] - Preparation of documentation related to the submission by Tech3Lab operations staff (David Brieugne). - Minor corrections apported by the student. Development of the experimental protocol and stimuli. [70%] - Conception of experiment procedure by Tech3Lab operations staff (Frédérique Bouvier and Luis Carlos Castiblanco) with assistance of the student.

	- Choice of questionnaires and instruments by the Student with Tech3Lab operations staff (Luis Carlos Castiblanco) and thesis supervisor (Sylvain Sénécal). - Creation of Qualtrics by the student with recommendations from Tech3Lab operations staff (Luis Carlos Castiblanco).
Data collection	Recruitment of participants for data collection. [0%] - Participants recruited by a third party. Inception and installation of laboratory set-up. [0%] - Installation of data collection devices and instruments by Tech3Lab operations staff (Salima Tazi and Xavier Côté). Pre-testing and data collection operations management. [80%] - Coordination and preparation of pre-test operations by Tech3Lab operations staff (Luis Carlos Castiblanco, Juan Fernandez-Shaw, Marine Farge and research assistant team) with participation of the student. - Observation and then moderation of all user test by the student with beginning of the moderation by Tech3Lab operations staff (Luis Carlos Castiblanco, Juan Fernandez-Shaw, Marine Farge). - Technical aspect of the data collection handled by research assistant team.
Statistical analysis	Performing statistical analysis. [75%] - Extraction of data and treatment of the data to synchronize all instruments by the student. - Conducting statistical analysis with the help of Tech3Lab operations staff (Shang Lin Chen). - Interpretation and presentation of results by the student with the assistance of the Tech3Lab operations team (Luis Carlos Castiblanco).
Writing	Wrote the thesis in the current form. [100%] - Redaction by the student with comments and corrections from thesis supervisor (Sylvain Sénécal) and thesis co-supervisor (Muhammad Aljukhadar).

Chapter 1: Literature Review and Hypotheses

To support and justify the relevance of this study, a literature review was conducted. The main area of interest was the study of familiarity and its impact on the lived experience of users, based on their emotions and behaviours.

The literature review is structured as follows: A definition of familiarity, followed by its influence on emotions, and behaviours, which is followed by their influence on behaviours and on satisfaction.

1.1. Familiarity

Familiarity is a construct that has traditionally been difficult to define, capture, and quantify and mostly relies on self-reporting measures, which are prone to biases (Yu et al., 2022). In our context, familiarity can be defined as the knowledge customers have of a product or service, based on their experience and previous contacts (Luhmann, 1988). The experience of the user with technology is strongly affected by their familiarity with it and unfamiliar interactive artefacts require the development of new cognitive mechanisms (Yu et al., 2022).

Previous work has shown that when using unfamiliar tools that require new skills and patterns of interaction, individuals will typically initially perform poorly and it is therefore expected that familiarity with a website can have a significant impact on navigation, browsing, and the overall user experience, as users who are more familiar are less likely to become confused/disoriented while having to traverse through multiple levels of a deep website or resort to trial-and-error strategies to achieve their goals (Yu et al., 2022).

Familiarity therefore reduces the cost of browsing, as time spent having to backtrack or seek new paths is minimised (Yu et al., 2022). This is because unfamiliar technologies require users to create new cognitive frameworks to adapt to advances in end-user-facing technologies (Tomasi et al., 2018). It is however important to focus on those changes because, in some cases, it may not result in performance gains due to users' negative attitudes towards the new technology or because the cognitive shift required is too drastic relative to the potential gain (Tomasi et al., 2018). This is because the information processing capabilities of human are limited, and every additional effort spent on reading reduces the mental resources available for comprehension (Thüring et al., 1995). Still due to how the cognitive framework works, a low

level of familiarity seems to alter the ability of users to complete a task in a timely manner compared to familiar users (Antoun & Cernat, 2020).

Familiarity is based on previous knowledge, experience, or skills of using a particular interface (Zhao & Nakatani, 2023).

One specifically important attribute when talking about user experience on web interfaces is navigation (Rupprecht et al., 2009). Aspects such as layout, organisational features, information presentation as well as usability, media richness, accessibility, personalization, adaptation or experience-related traits such as design have been identified as relevant and important (Rupprecht et al., 2009).

The interface is an important part of the user experience. User experience, as defined by the ISO 9241-210:2010 standard, is a person's perception and response resulting from system use that includes all the user's emotions, preferences, perceptions, physical and psychological responses, and behaviours (Dong et al., 2023).

Additionally, the ability to use a service online efficiently, otherwise called ease of use, is a predictor for satisfaction and for behavioural intentions such as recommending, reusing, buying again, and price sensitivity (Zeng et al., 2009). It is therefore relevant to better understand those relationships to improve user experience because this will lead to both improving the experience for users and loyalty for companies.

To start to understand familiarity and how it influences experiences, we can start by focusing on emotions while using an interface.

1.2. Emotions

There is no commonly agreed-upon definition of emotion in any of the disciplines that study this phenomenon (Mulligan & Scherer, 2012). More specifically, emotions cannot be defined as a unitary concept (Wierzbicka, 2010). To propose one nonetheless, we decided to use the definition of emotions proposed by psychologists in which they are regarded as a process of changes in different components rather than a homogeneous state (Myung Eun & Mi Jeong, 2017). In general, the emotions can be largely categorized from two perspectives: discrete and dimensional (Myung Eun & Mi Jeong, 2017).

The discrete emotions theories were inspired by Darwin (Myung Eun & Mi Jeong, 2017). Researchers proposed a set of basic emotions from which emotion experiences are constructed

and those emotions each corresponds to unique components in experience, physiology, and behaviour (Myung Eun & Mi Jeong, 2017).

The most common dimensions are valence, arousal, and approach (Myung Eun & Mi Jeong, 2017). The valence dimension is a continuum of states from positive to negative, whereas the arousal dimension is a continuum of states from calm to excited and approach is characterised by tendencies to approach stimuli, whereas avoidance motivation is characterized by tendencies to avoid stimuli (Myung Eun & Mi Jeong, 2017).

Approach not being related to the context of our study, we are focusing on the two first dimensions: valence and arousal.

Emotional valence plays an essential role when evaluating emotions as it measures the degree of attractiveness or repulsion of individuals towards a stimulus (Estupiñán et al., 2014). Emotional valence relates to the evaluation of one's experience, ranging from displeasure to pleasure (Laukka, 2005). Often captured by a webcam, facial micro expressions are generally quantified using some form of automated facial expression analysis software and assessed through the lens emotional valence (Swoboda et al., 2021). Emotional valence, characterized by negative emotions such as fear, anger and sadness and positive emotions such as joy and surprise are responses to specific stimulus (Swoboda et al., 2021). Multivariate research into a variety of emotional phenomenon can be best organised into two overall emotional/motivational dimensions that have been variously called positive activation and negative activation (Hazlett & Benedek, 2007). The first dimension encompasses the various discrete positive emotions such as joy, pleasure, love, interest, hope, etc., while the second dimension encompasses the discrete negative emotions of fear, sadness, anger, etc., and the more motivational concepts of stress and tension (Hazlett & Benedek, 2007).

Emotional arousal is crucial to evaluate emotions as it measures the level of activation of the reticular activating system in the brain (Estupiñán et al., 2014). Emotional arousal (otherwise known as emotional excitation) is the reaction to an emotional stimulus that induces a state of vigilance or a state of attention (Kandell, 2000). It also represents the emotional intensity (Kandell, 2000). It is used to separate states with a low level of excitation (calmness) from states with a high level of excitation (such as surprise for example) (Boucsein, 2012). It stems from one's sense of energy, ranging from sleep, or calm, to frenetic excitement (Swoboda et al., 2021).

These dimensions of emotions are important to consider in HCI contexts. Most scholars agree that emotion is one of the main dimensions of user experience (Chen et al., 2018). Emotion is

one of the primary characteristics that distinguishes human beings from other living things (Zhang et al., 2023).

Emotional experiences vary within a positive-negative dimension and vary in intensity, and more specifically across categories of discrete emotions such as interest, enjoyment, sadness, or anger (Izard et al., 2011). Those emotions can significantly impact the quality of the experience for users. Detecting those emotions and understanding behaviors deriving from emotional state of users opens the path to more immersive user experience (Bisogni et al., 2021).

Emotions and familiarity are linked. Emotions when interacting with technology are influenced by our previous experiences and the overall knowledge possessed (Saplacan and Herstad, 2018). Familiarity involves expectation and prediction based on prior knowledge, therefore, many factors could play an important role in the emotional state (Thammasan et al., 2015). Two aspects of emotions widely used in HCI are emotional arousal and emotional valence (Tan et al., 2016).

The first hypothesis we are focusing on is how familiarity influences the user's emotions. Emotions are an important aspect of user experience because emotions help designers target users, but also help designers see which aspects or functions need improvements (Chen et al., 2018). When it comes to assessing user experience, we can find that the emotion of users in each task is subject to contextual and individual differences, as well as user experience (Chen et al., 2018). Therefore, we wanted to test how familiarity, as a specific factor, would influence emotions.

According to a study on sound symbolic and familiarity, familiarity would lead to a higher emotional valence and to a lower emotional arousal (Kambara & Umemura, 2021).

It is with this information in mind that we formulated the following hypothesis:

H1: Familiarity with the interface positively affects emotional valence.

H2: Familiarity with the interface negatively affects emotional arousal.

1.3. Visual exploration

People being "creatures of habit", they form ingrained schemas to help them perform routine tasks which will be impacted by a change in the experience and could cause poorer performance

when using new tools, especially when the technology works in a way at odds with the existing schemas (Tomasi et al., 2018).

Our research led us to focus on the exploratory gaze behaviour. Previous research has shown that pupil size generally increases with an individual's cognitive load (Wu et al., 2024). However, pupil size can be affected by factors such as task familiarity and gaze position (Wu et al., 2024).

Human visual exploration is the result of a complex interplay between saccadic eye movements and visual fixations (Chiffi et al., 2021) and the concept of gaze refers to the manner in which people view the world around them (Gelbman & Collins-Kreineer, 2016). During the exploration of an image, saccades and fixations are typically not homogeneously distributed in space, but are driven by attention, saliency, and other cognitive factors (Chiffi et al., 2021).

Fixations are described as a steady gaze on a particular location for some period of time while saccades are described as a quick eye movement between locations (Goodwin et al., 2022).

Eye movements are essential in the execution of daily tasks, whether it concerns the search for visual information or the performance of a motor action (Warlop et al., 2020). Efficient eye movement control is characterized by stable fixation and goal-directed saccades and is subject to a specific gaze strategy which appears to be specific to the particular task (Warlop et al., 2020).

In reading, a task that only requires eye saccadic movement and, therefore, saccadic eye movements and fixations are made in an orderly fashion along the lines of the text in order to make a meaningful interpretation of the text; while in goal-directed motor tasks, visual sampling is needed for the planning and control of a movement, each motor action is closely preceded by goal-directed eye movements (Warlop et al., 2020).

Gaze behaviour, therefore, seems to provide additional insight into movement-related problems experienced by individuals (Warlop et al, 2020).

A study on exploratory gaze behaviour suggested that familiarity with an interface leads to a reduction in exploratoty gaze behaviour, resulting in a more efficient search (Beattie & Morrison, 2018). However, the study provided limited details, leaving a gap in the litterature.

Based on this information, we established the following hypothesis:

H3: Familiarity with the interface will result in less exploratory gaze behaviour.

1.4. Task performance

Task performance can be evaluated in user experience through two distinct metrics: task completion time and task error rate (Mingvin et al., 2020). Task completion time refers to the time required to complete the task while the task error rate refers to the success rate of participants. These two elements are important when studying an interface because it indicates the ability of users to complete a specific task, and the time required to do so.

Task familiarity and complexity are inextricably related, and this strong connection has different implications, specifically high familiar tasks should require less thought to be performed (Lo Destro et al., 2019). This is because familiarity with information eases the cognitive load (Qiu & Xi, 2020). Task familiarity can come from task repetition. Task repetition means repeating the same task and obtaining prior knowledge (Qiu & Xi, 2020).

Our literature review revealed that familiarity improves the probability of completion and performance (Soler et al., 2015). We are here focusing on the performance aspect of these findings and measuring it with the time of completion because familiarity can improve the ability of a user to complete a task in a timely manner (Antoun & Cernat, 2020). Based on this, we established the following hypothesis:

H4: Familiarity with the interface negatively affects the time of completion.

1.5. Behavioural intentions

Previous research identified four distinct dimensions of behavioural intentions: recommendations, repurchase/reuse intentions and price sensitivity (Zeng et al., 2009). In our research, we focus on reuse intention.

1.6. Emotions, performance, and their impact on the intention to reuse

Emotions are linked to our behaviour. While using a website, a greater level of frustration leads to avoidance of usage (Hazlett and Benedek, 2007).

Reuse intention is a type of intention for loyalty behavior (Shim et al., 2021). If customers are supplied services that meet their expectations, they are more likely to reuse these services (Park, 2019). However, the literature indicates that experiencing an unpleasant event negatively

affects consumers' psychological states, which, in turn, directly affects their behavioural intention to use a service (Malhotra et al., 2017).

Intention to reuse is therefore linked to customer loyalty.

Customer loyalty is characterised by the customer's preference to purchase a product, service or from an organisation consistently when the need arises to purchase with preference and consistency as key issues (McMullan & Gilmore, 2008).

Customer loyalty is associated with different similar variables such as "continued intention to reuse", "intention to reuse or return", and "repeat purchase" (Malhotra et al., 2017).

According to a study on user's behaviour on food delivery apps, arousal is directly linked to users' intention to reuse (Rejón-Guardia, 2024). According to the same study, arousal is linked to a feeling of pleasure, and this is why arousal is positively correlated with the intention to reuse (Rejón-Guardia, 2024). As established in the previous chapter, pleasure is one of the many emotions associated with emotional valence (Hazlett & Benedek, 2007). We wanted to observe if these results would apply to our current context and emerged from this the following hypotheses:

H5: Emotional valence positively affects the intention to reuse.

H6: In a neutral or positive valanced context, emotional arousal positively affects the intention to reuse.

Even if emotions are useful to describe future behaviour, the behaviour while using the service can also be used to indicate the future behaviour of the user.

Exploratory gaze behaviour is linked to the pattern of visual attention (Krejtz et al., 2017).

Considering the ease of use is correlated to the intention to reuse (Alam et al., 2024) and that customers prioritise efficient shopping (Zhang et al., 2023), we wanted to explore the relationship between the exploratory gaze behaviour and the intention to reuse. This is because, in the section about visual exploration, we established a relationship between the gaze behaviour and the difficulties experienced by eye movements (Warlop & al, 2020). Based on this information, we issued the following hypothesis:

H7: A higher exploratory gaze behaviour negatively affects the intention to reuse.

The last dependent variable we wanted to observe as a potential predictor for future behaviour is the time of completion, still with the idea in mind that the ease of use is linked to the intention

to reuse (Alam et al., 2024) and that the current research shows that customers prioritise efficient shopping (Zhang et al., 2023). According to a study on food delivery apps, a way to influence the continued intention to reuse is by reducing time (Alalwan, 2020). We decided to also test this variable for our current context and made the following hypothesis:

H8: A lower time of completion positively affects satisfaction.

1.7. Emotions, performance and their impact on user satisfaction

Researchers have yet to develop a consensual definition of consumer satisfaction (Yi, 1990). However, in the context of marketing, the literature seems to share some common elements, the first one being that consumer satisfaction is an affective response that occurs following a particular business-related occurrence such as a transaction, consumption experience, or a specific product usage (Grégoire, 2019).

When familiarity increases, so does customer expertise, which may affect customers' responses significantly due to the fact that familiarity leads to a more elaborate cognitive structure, which may affect customer's emotional responses (Park et al., 2018). More specifically, when service performance was high, high familiarity customers expressed higher satisfaction and behavioural intentions than did less familiar customers (Park et al., 2018).

Another component of user satisfaction is related to the type of occurrence after which it takes place. The customer will compare their experience to standards based on previous experiences such as performance of the product or the experience of the service he purchased (Grégoire, 2019).

The last component of consumer satisfaction is related to the timing of its occurrence (Grégoire, 2019). The literature tends to agree that this concept takes place after the purchase of a product or service but can also occur at other moments, as satisfaction varies greatly over time and that it will eventually take place when the evaluation of such product or service happens (Giese and Cote, 2000).

Furthermore, no agreement seems to have been reached considering how long a specific satisfaction response lasts (Giese and Cote, 2000; Yi, 1990). In the context of this study, satisfaction is considered after task completion and experience completion to analyse both for each task and overall.

Customers experience high satisfaction when their emotions are positive and moderate in strength (Gavriel et al., 2020).

According to this affirmation, a high emotional valence would lead to a higher satisfaction while a moderate emotional arousal would lead to a higher satisfaction. We therefore established the following hypotheses:

H9: Emotional valence positively affects satisfaction.

H10: Moderate emotional arousal leads to more satisfaction.

We previously established a relationship between the exploratory gaze behaviour and difficulty. Difficulty is negatively related to satisfaction. We therefore explored previous research to observe if there was a link between the exploratory gaze behaviour and satisfaction.

Based on a study on landscapes visual exploration, a lower exploratory gaze behaviour leads to a higher satisfaction (Zhang et al., 2022). Applying this logic to our context, we established the following hypothesis:

H11: Exploratory gaze behaviour negatively affects satisfaction.

Our final element of interest with potential influence on satisfaction is the time of completion.

Based on a study on web search, time of completion has a negative correlation with user satisfaction (Xu & Mease, 2009). We therefore applied those findings to determine if this is also the case in our context with the following hypothesis:

H12: Time of completion negatively affects satisfaction.

1.8. Emotions, performance, and their impact on the intention to recommend

Word of mouth intentions refer to the intention after use of a consumer to talk about a brand or a product (Finn et al., 2009).

Consumers often turn to others for a recommendation when they are thinking of purchasing and is the ultimate test of the relationship between the customer and the brand (Finn et al., 2009).

WOM communication involves individuals sharing assessments of their experiences, which can include both positive and negative evaluations of service encounters (cam et al., 2019).

Positive WOM communication typically emerges from satisfactory service encounters, while negative communication generally follows unsatisfactory encounters (cam et al., 2019).

Starting with the emotions, there is no direct connection between emotional valence, emotional arousal and the intention to recommend. However, a study on stress retailing established a general relationship between emotions and the intention to recommend (Lucia-Palacios et al., 2020). Our theoretical model including the emotional valence and the emotional arousal, we established the following hypotheses:

H13: Emotional valence positively affects the intention to recommend.

H14: A moderate emotional arousal positively affects the intention to recommend.

According to a study on shopping website design, usability is one of the main factors predicting satisfaction (Guo et al., 2023). The gaze behaviour is linked to the ability to find specific information which would lead to greater satisfaction (Zhang et al., 2022), and satisfaction is linked to the intention to recommend (Lee, 2018), we elaborated the following hypothesis:

H15: A lower exploratory gaze behaviour leads to higher intention to recommend.

As mentioned, time of completion is also linked to satisfaction (Xu & Mease, 2009). And as we established in the previous hypothesis, satisfaction is related to the intention to recommend (Lee, 2018). We therefore established the following hypothesis:

H16: A lower time of completion leads to a higher satisfaction.

1.9. Theoretical model

Figure 1: Theoretical model.
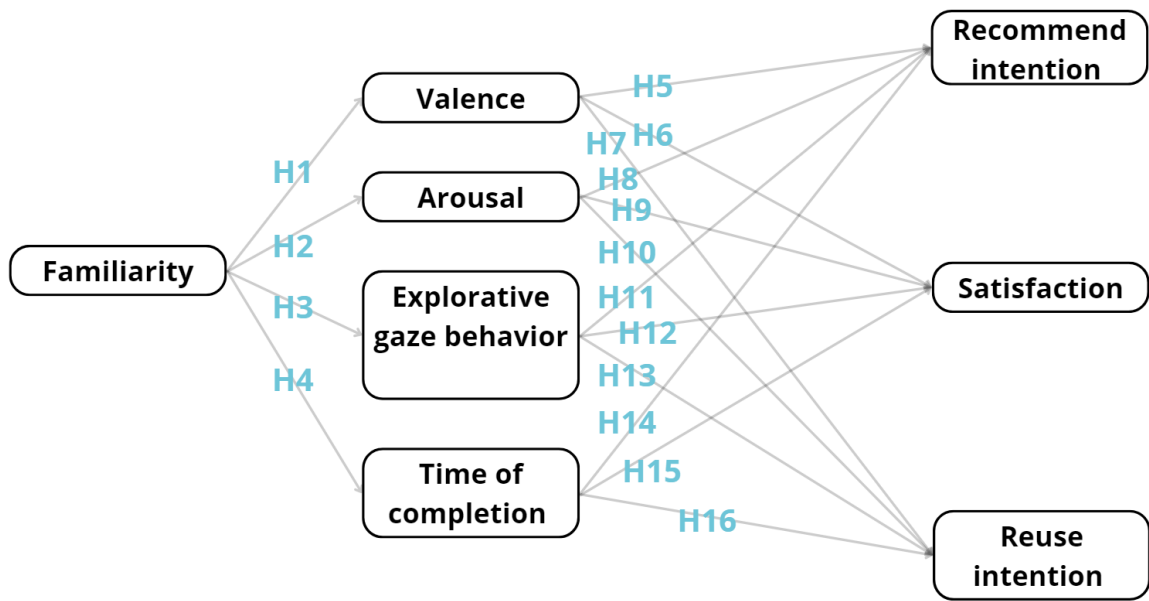
Chapter 2: Method

2.1. Experimental design

This laboratory experiment used a one factor between-subjects design to test the proposed hypotheses. This study used two groups: One familiar with the interface and a second one who was not (respectively 15 and 16 participants). To make the distinction between participants who had previously used the interface, we used their telecommunication services based on their personal services to assess if they had previously used the interface presented on the prototype used for the experiment or not.

2.1.1. Sample

Thirty-one participants (18 males) participated to this study through a recruitment agency. The ages ranged from 28 to 65 (mean =47 and St. Dev. = 11.5). Participants received a compensation of $100CAD for their participation. This study was approved by our institution Research Ethics Board (certificate #2023-5390) and consent was obtained from all participants before starting the experience.

Here is a table to summarise informations about participants.

Table 2: Demographic variables

	Participants	Average age	Male	Female
G1	15	46	8	7
G2	16	46	10	6

2.1.2. Procedure

When arriving at the laboratory, participants were asked to provide written consent for their participation to the study. We then prepared the calibration of all physiological tools starting with the webcam (to process the recording in a facial expression recognition system after the experiment), then eye tracking (*Tobii*, 2023) and then the electrodermal activity (*EDA*, 2015) and moved on to the experiment. All participants were exposed to all tasks in the same order to ensure all participants would have the same conditions during the experiment. Those tasks all required for the participants to find where to go on the interface to find the right information

or functionality depending on the task. There was a total of fourteen tasks with various level of complexity. Those tasks could go from checking your bill to finding how to buy a specific product.

Table 3: Tasks

Scenarios	Tasks	Instructions
Scenario #1 You are Dominique Parent, you have been a client at Videotron for a few years. Today, June 4th, 2023, you decide to check some information related to your services and your contracts on *Name of company*'s website. When you are done reading this scenario, please mention it out loud.	1.1	Please check if the invoice for the month of May for the phone with the number 514-987-6543 has been paid. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	1.2	Please check the quantity of mobile data for the phone 514-987-6543 and let us know when you are finished. You will need to answer a few questions afterward. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	1.3	Please check if you have paid your current bill, including your mobile phone service and Illico for the phone with the number 514-123-4567.

		You will need to answer a few questions afterward. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	1.4	Please check the quantity of mobile data for the phone 514-123-4567 and let us know when you have finished. You will need to answer a few questions afterward. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
Scenario #2 A year later, you decide to make some changes in your services and contracts with *Name of company*. To do so, you go on *Name of company*'s website. When you are done reading this scenario, please mention it out loud.	2.1	You have just canceled your *Name of company's service* Internet and TV package. Please add Internet and television (*Name of company's service*) for your home from the Videotron's website. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	2.2	Please pay your bill for the "Maison" address.

		When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	2.3	Please check if you will have enough data for the remainder of the cycle and add a data block if needed. Your average daily mobile data consumption is 0.5GB. You will need to answer a few questions afterward. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	2.4	Please add two new mobile phone lines to your account for your two children. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
Scenario #3 Two years later, you decide to realise some additional changes on your services and contracts with *Name of	3.1	Please change/modify your television channels. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.

company*. To do so, you go on *Name of company*'s website. When you are done reading this scenario, please mention it out loud.	3.2	You have just purchased a cottage and would like to subscribe to *Name of company*'s internet services. Please add a new billing account "cottage" to your account. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	3.3	You have just purchased a second television for your primary address. Please purchase another *Name of company's service* (television) terminal for your account. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	3.4	You are considering changing your mobile phone. Please shop for mobile devices on the *Name of company* website. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.
	3.5	Please activate pre-authorized payments on your two billing accounts: "Maison" and "Chalet". When you are ready to start, you can begin the task by clicking on this link.

		Once you have completed the task, mention it out loud.
	3.6	Please change your *Name of company* access password. When you are ready to start, you can begin the task by clicking on this link. Once you have completed the task, mention it out loud.

The customer account used for this experiment was created in advance with fictious customer information to make sure all participants would use the same interface and to make sure that no identifying information from the participant would be part of the experience.

After each task, the participants were presented affective sliders to assess their perceived emotional arousal and their perceived emotional valence (Betella & Verschure, 2016). Their satisfaction was assessed with the CSAT measurement scale (Kiradoo, 2019). Physiological data was also collected throughout each task from all participants (See Table 3). After completing the tasks, a finale questionnaire was presented to all participants to assess their intention to reuse with the intention to reuse scale (Filipe Araujo Silva et al., 2023) and to assess their intention to recommend with the NPS (Baquero, 2022).

2.2. Measures

Different tools were used throughout the experiment to measure the variables.

Table 4: Measures

Variable	Measure	Explanation	Items (if applicable)	Tools	References
Visual exploration gaze (physio)	Visual exploration gaze (k-coefficient)	The k-coefficient vary from –1 to 1; -1 represents a more focal attention and 1 represents a more exploratory attention.		Tobii Pro Lab	*Tobii*, 2023
Emotional valence (physiological measure)	Micro-movements of facial muscles	The micro-movements are converted into a score from –1 to 1. A score below 0 represents a negative emotion and a score above 0 represents a positive emotion.		FaceReader 8.1	Leanne Loijens & Olga Krips, 2021
Emotional arousal (physiological measure)	Phasic electrodermal activity	Indicator from 0 to 1; 0 represents a state of calmness and 1 represents a high level of excitement.		Biopac MP-150	Wang et al., 2022

Emotional valence (self-reported)	Perceived valence	Affective slider from 0 to 100. 0 represents no pleasure and 100 represents a high level of pleasure.	This instruction is asking you to move a slider to represent the level of pleasure you experienced during the task. Move the slider to the right to indicate a higher level of pleasure, and to the left to indicate a lower lovel of pleasure.	Questionnair e	Betella & Verschure, 2016
Emotional arousal (self-reported)	Perceived arousal	Affective slider from 0 to 100; 0 represents a state of calmness and 100 represents a high level of excitement.	This instruction is asking you to move a slider to represent the level of activation you experienced during the task. Move the slider to the right to indicate a higher level of activation (excitement) , and to the left to	Questionnair e	Betella & Verschure, 2016

			indicate a low level of activation (calmness).		
Completion time	Seconds	The duration of the time from start to end.		Observation during the experiment	
CSAT (self-reported)	Satisfaction	A 1 item on a 5-point Likert scale varying from Very unsatisfied to Very satisfied.	Are you satisfied with the interface used during this task? Please respond on a scale of 1 to 5 (where 1 = very dissatisfied, and 5 = very satisfied).	Questionnaire	Kiradoo, 2019
NPS (self-reported)	Intention to recommend	A 1 item on a 10-point Likert scale varying from Very unlikely to Very likely.	What is the likelihood that you would recommend *Name of company* to a friend, colleague, or family member?	Questionnaire	Baquero, 2022
Intention to reuse scale (self-reported)	Intention to reuse	A scale composed of 4 items measured on a 7-point Likert scale varying from Totally	Please indicate your level of agreement with the following statements	Questionnaire	Filipe Araujo Silva et al., 2023

		disagree to Totally agree.	on a scale of1 to 7: -If I have access to the *Name of company* website to check my account, I will use it. -I think my interest in the *name of company* website for checking my account will increase in the future. -I will use the *Name of company* website to check my account as much as possible. -I plan to use the *Name of company* website to check my account in the future. You can rate each statement on a scale of 1 (strongly disagree) to		

			7 (strongly agree).		

To measure the emotional valence, we used the FaceReader 8.1 (Noldus Technology Inc, Wageningen, Netherland), a facial expression recognition tool. This software was used to capture the micro-movements of facial muscles every $1/10^{th}$ of a second and scores emotional valence from -1 to 1 (Leanne Loijens & Olga Krips, 2021), values below 0 being for negative emotions and values above 0 being for positive emotions.

Arousal was collected with the Biopac MP-150 system (Goleta, United States) with wireless sensors. This tool uses a sensor placed on the unused hand of the participant throughout the entire experiment and provided phasic EDA. Phasic EDA scores measure eccrine activity that is impacted by sympathetic nervous system activity evoked by stimuli and has been used as an indicator of arousal ranging from calm to excitement (Wang et al., 2022).

The visual exploration gaze was measured by Tobii Pro Lab, an eye-tracking software developed by Tobii AB (Stockholm, Sweden). This device uses a pattern of near-infrared lights to detect the focus of the regard. The gaze is calculated based on the fixation and the attention (*Tobii*, 2023). To measure the visual exploration gaze behavior, we used the k-coefficient, a measure calculated by using both fixation durations and saccade amplitudes to convert them into a standard score, which allow computation of an ambient/focal attentional coefficient per individual scan path (Krejtz et al., 2016).

All physiological data was synchronized by the SynchBox hardware solution (Noldus Information Technology, BV, Wageningen, Netherlands). This device was connected via cable to all computers and sent a TTL (Transitor-Transitor Logic) signal every 60 seconds throughout the entire experiment. Those signals were interpreted by the different software solutions used to capture physiological data as event markers. Those markers were stored in Observer XT 11 (Noldus Information Technology, BV, Wageningen, Netherland) and used in post-processing to synchronize the data in a unified timeframe (Zimmerman et al., 2009). The synchronization of the dataset was done automatically by the Cobalt Photobooth software (Léger et al., 2019). The set-up of the room of the experiment with the data collection tools is available in Appendix 1.

For the perceived experience of participants, we used questionnaires in which participants self-reported about their experience after each task. All scales used were adapted from prior research for context, maintaining their original scale answer formats. Participants were asked

to report their emotional valence and their emotional arousal on an effective slider from 0 to 100 (0 being low pleasure and 100 being high pleasure and 0 being low excitation and 100 being high excitement respectively) with emoticons to indicate the intensity of the emotion (Betella & Verschure, 2016). The perceived level of satisfaction during the tasks was evaluated by the Customer Satisfaction Scale (CSAT), one of the most popular methods of measuring customer satisfaction (Kiradoo, 2019). For this scale, was used a 5-point Likert scale. At the end of the experience, a scale was presented to the participants to evaluate their intention to reuse this interface and to evaluate their positive intention of word of mouth. The intention to reuse was assessed by an adapted version of the intention to reuse scale, a scale previously developed and validated (Filipe Araujo Silva et al., 2023). For this scale was used a 7-point Likert scale. The positive word of mouth intention was assessed by the NPS scale, a 10-point Likert scale developed by Reicheld (2003) used to assess customer loyalty towards a company's products or services after use by a single item (Baquero, 2022).

Chapter 3: Results

3.1. Descriptive statistics

Overall, the results obtained between both groups are similar. The comparison between both groups focused on physiological measures and self-assessed measures based on what they experienced during the realization of the tasks. We focused on the emotional valence, the emotional arousal, the visual exploratory gaze and the time of completion. A summary of the descriptive statistics is summarized in the table below. Regarding the emotional valence, both the mean and the standard deviation are similar. The median between both only shows a slight variation (G1: 8.395 / G2: 12.746). Regarding the emotional arousal, there is a slight variation in the mean between both groups (G2: 46.752 / G2: 50.237). Otherwise, both standard deviation and median are similar for both groups. For the visual exploratory gaze, there are some variations for the mean, the standard deviation and the median but not major differences (respectively G1: -.044 ; -.030 ; .277 / G2: -.024 ; -.041 ; .328). And for the last variable, the mean, the standard deviation and the median were all similar regarding the completion time.

Table 5: Summary of descriptive analysis for both groups.

Group	N Observed	Variable	N	Mean	Median	StdDev
G1	210	Perceived valence	210	54.462	55.000	18.510
		Perceived arousal	210	46.752	53.000	23.552
		Measured valence	155	-.060	-.030	.100
		Measured arousal	122	.109	.036	.241
		Visual exploratory gaze	196	-.044	-.030	.277
		Time (seconds)	196	56.936	44.665	46.870
G2	224	Perceived valence	224	53.621	55.000	21.957
		Perceived arousal	224	50.237	51.000	21.957

		Measured valence	166	-.022	-.016	.110
		Measured arousal	166	.092	.040	.153
		Measured arousal	166	.092	.040	.153
		Visual exploratory gaze behavior (k coefficient)	224	-.024	-.041	.328
		Time (seconds)	224	58.773	41.092	53.508

3.2. Hypotheses Testing

Hypothesis 1:

The first hypothesis' purpose is to test the relation between familiarity and emotional valence with the assumption that the emotional valence would be higher for the familiar group. We used both self-assessed evaluation and physiological data to test this hypothesis. The independent variable is familiarity, and the dependent variable is emotional valence. We used a Wilcoxon sum ranked test for this analysis. We used this test because we compared two independant samples for this hypothesis. We used the significance level p = .05 for all statistical tests. This test did not reveal a statistically significant difference between familiarity and emotional valence for both perceived (p = .6897) and physiological (p = .0849) emotional valence. Thus, H1 is not supported.

Hypothesis 2:

The second hypothesis's purpose is to test the relationship between familiarity and emotional arousal with the assumption that the emotional arousal would be lower for the familiar group. We used both self-assessed evaluation and physiological data to test this hypothesis. The independent variable is familiarity, and the dependent variable is emotional arousal. We used a Wilcoxon sum rank test for this analysis. We used this test because we compared two independant samples for this hypothesis. This test did not reveal a statistically significant

difference between familiarity and emotional arousal for both perceived (p = .7112) and measured (p = 1) emotional arousal. Thus, H2 is not supported.

Hypothesis 3:

The third hypothesis' purpose is to test the relationship between familiarity and the exploratory gaze behaviour with the assumption that the exploratory gaze behaviour would be lower for the familiar group. The independent variable is familiarity, and the dependant variable is exploratory gaze behaviour. We used a Wilcoxon sum rank test for this analysis. We used this test because we compared two independant samples for this hypothesis. This test did not reveal a statistically significant difference between the familiarity and the exploratory gaze behaviour (p = .9185). Thus, H3 is not supported.

Hypothesis 4:

The fourth hypothesis' purpose is to test the relationship between familiarity and the time of completion with the assumption that the time of completion would be shorter for the familiar group. The independent variable is familiarity, and the dependent variable is time of completion. We used a linear regression with random intercept model for this analysis. We used linear regression because we were trying to observe if familiarity could be used to predict the time of completion and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant difference between the familiarity and the time of completion (p = .8909). Thus, H4 is not supported.

Hypothesis 5:

The fifth hypothesis' purpose is to observe the relationship between emotional valence and user's intention to reuse with the assumption that a higher emotional valence would lead to a higher intention to reuse. We used both self-assed evaluation and physiological data to test this hypothesis. The independent variable is emotional valence, and the dependent variable is user's intention to reuse. We used a linear regression with random intercept model for this analysis. We used linear regression because we were trying to observe if the emotional valence could be used to predict the intention to reuse and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between

perceived emotional valence and user's intention to reuse (p = .1013, t = 1,69). However, this test did reveal a statistically significant relationship between physiologial emotional valence and user's intention to reuse (p = .0117, t = -2.73). Thus, H5 is partially supported.

Table 6: Result for H5 – Relationship between emotional valence and user's intention to reuse.

DV	Effect	Estimate	StdErr	DF	tValue	Probt
Physiological valence	Reuse_int	-6.8848	2,5242	24	-2.73	.0117
Self-reported valence	Reuse_int	.02853	.01686	29	1,69	.1013

Hypothesis 6:

The sixth hypothesis' purpose is to test the relationship between emotional arousal and user's intention to reuse with the assumption that a higher arousal would lead to a higher intention to reuse. We used both self-assessed evaluation and physiological data to test this hypothesis. The independent variable is emotional arousal, and the dependent variable is user's intention to reuse. We used a linear regression with random intercept model for this analysis. We used a linear regression because we were trying to observe if the emotional arousal could be used to predict the intention to reuse and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between both perceived (p = .07, t = 1.88) and physiological (p = .3923, t = 0.87) emotional arousal and user's intention to reuse. Thus, H6 is not supported.

Hypothesis 7 :

The seventh hypothesis' purpose is to test the relationship between the visual exploratory gaze behaviour and the user's intention to reuse with the assumption that a higher exploratory gaze behaviour would lead to a lower intention to reuse. The independent variable is exploratory gaze, and the dependent variable is intention to reuse. We used a linear regression with random intercept model for this analysis. We used a linear regression because we were trying to observe if the size of the visual exploratory gaze behaviour could be used to predict the intention to reuse and we used a random intercept model because the effect varies across participants. This

test did not reveal a statistically significant relationship between the visual exploratory gaze behaviour and the user's intention to reuse (p = .2387, t = 1.2). Thus, H7 is not supported.

Hypothesis 8:

The eighth hypothesis' purpose is to test the relationship between the time required for the tasks and the user's intention to reuse with the assumption that a shorter time would lead to a higher intention to reuse. The independent variable is the time, and the dependent variable is the intention to reuse. We used a linear regression with random intercept model for this analysis. We used a linear regression because we were trying to observe if the time of completion could be used to predict the intention to reuse and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between the time required for the tasks and the user's intention to reuse (p = .251, t = 1.17). Thus, H8 is not supported.

Hypothesis 9:

The ninth hypothesis' purpose is to test the relationship between emotional valence and user's satisfaction with the assumption that a higher valence would lead to a higher satisfaction. We used both self-assessed evaluation and physiological data to test this hypothesis. The independent variable is emotional valence and the dependent variable is satisfaction. We used a linear regression with random intercept model for this analysis. We used a linear regression because we were trying to observe if the emotional valence could be used to predict satisfaction and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between both perceived (p = .0856, t = 1.78) and physiological (p = .9084, t = -.12) emotional valence and user's satisfaction. Thus, H9 is not supported.

Hypothesis 10:

The tenth hypothesis' purpose is to test the relationship between emotional arousal and user's satisfaction with the assumption that a moderate emotional arousal would lead to a higher satisfaction. We used both self-assessed evaluation and physiologic data to test this hypothesis. The independent variable is emotional arousal, and the dependent variable is satisfaction. We

used a linear regression with random intercept model for this analysis. We used a linear regression because we were trying to observe if the emotional arousal could be used to predict satisfaction, and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between both perceived (p = .7126, t = .37) and physiological (p = .2899, t = -1.08) emotional arousal and user's satisfaction. Thus, H10 is not supported.

Hypothesis 11:

The eleventh hypothesis' purpose is to test the relationship between the exploratory gaze behaviour and the user's satisfaction with the assumption that a lower exploratory gaze behavior would lead to a higher satisfaction. The independent variable is exploratory gaze behaviour and the dependent variable is satisfaction. We used a linear regression with random intercept model for this analysis. We used a linear regression because we were trying to observe if the size of the exploratory gaze behaviour could be used to predict satisfaction, and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between the exploratory gaze behaviour and user's satisfaction (p = .1479, t = -1.49). Thus, H11 is not supported.

Hypothesis 12:

The twelfth hypothesis' purpose is to test the relationship between the time required to complete the tasks and user's satisfaction with the assumption that a shorter time of completion would lead to a higher satisfaction. The independent variable is time of completion, and the dependent variable is satisfaction. We used a linear regression with random intercept model for this analysis. We used a linear regression because we were trying to observe if the time of completion could be used to predict satisfaction and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between the time of completion and user satisfaction (p= .3088, t = -1.04). Thus, H12 is not supported.

Hypothesis 13:

The thirteenth hypothesis' purpose is to test the relationship between the emotional valence and the word-of-mouth intentions with the assumption that a lower emotional valence would lead to more positive word of mouth intentions. We used both self-assessed evaluation and physiologic data to test this hypothesis. The independent variable is emotional valence and the dependent variable is word-of-mouth intention. We used a cumulative logistic regression with random intercept model for this analysis . We used a cumulative logistic regression because the dependant variable is nominal and has more than two categories that do not have a given order and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significative relationship between both perceived (p = .3632, t = .92) and physiological (p = .6367, t = .48) emotional valence and positive word-of-mouth intentions. Thus, H13 is not supported.

Hypothesis 14:

The fourteenth hypothesis' purpose is to test the relationship between the emotional arousal and the word-of-mouth intentions with the assumption that a moderate emotional arousal would lead to more positive word of mouth intentions. We used both self-assessed evaluation and physiologic data to test this hypothesis. The independent variable is emotional arousal, and the dependent variable is word-of-mouth intention. We used a cumulative logistic regression with random intercept model for this analysis. We used a cumulative logistic regression with random intercept model because the dependant variable is nominal and has more than two categories that do not have a given order and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between perceived emotional arousal and positive word of mouth intentions (p = .8265, t = -.22). However, this test did reveal a statistically significant relationship between physiological arousal and positive word-of-mouth intentions (p = .049, t = -2.09). Thus, H14 is partially supported.

Table 7: Results for H14 – Relationship between emotional arousal and word-of-mouth intentions.

DV	Effect	Estimate	StdErr	DF	tValue	Probt
Self-reported arousal	NPS_aug	.0416	.045	28	-.22	.8265
Physiological arousal phasic	NPS_aug	-19.1755	9.1777	21	-2.09	.049

Hypothesis 15:

The fifteenth hypothesis' purpose is to test the relationship between the exploratory gaze behavior and the word-of-mouth intention with the assumption that a lower exploratory gaze behaviour would lead to more positive word of mouth intentions. The independent variable is exploratory gaze behaviour and the dependent variable is word-of-mouth intention. We used a cumulative logistic regression with random intercept model for this analysis. We used a cumulative logistic regression with random intercept model because the dependant variable is nominal and has more than two categories that do not have a given order and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between the exploratory gaze behaviour and positive word-of-mouth intentions (p = .4469, t = -.77). Thus, H15 is not supported.

Hypothesis 16:

The sixteenth hypothesis' purpose is to test the relationship between the time required to complete tasks and the word-of-mouth intention with the assumption that a lower time would time to more positive word of mouth intentions. The independent variable is time of completion, and the dependent variable is word-of-mouth intention. We used a cumulative logistic regression with random intercept model for this analysis. We used a cumulative logistic regression with random intercept model because the dependant variable is nominal and has more than two categories that do not have a given order and we used a random intercept model because the effect varies across participants. This test did not reveal a statistically significant relationship between the time and the positive word of mouth intentions (p = .8377, t = .21). Thus, H16 is not supported.

To conclude this section, here is a summary table of results:

Table 8: Summary of results for each hypothesis.

	Hypothesis	Results	P-value
H1	Familiarity positively affects emotional valence.	Not supported	(perceived) p = .6897

			(physiological) p = .0849
H2	Familiarity negatively affects emotional arousal.	Not supported	(perceived) p = .7112 (physiological) p = 1
H3	Familiarity negatively affects exploratory gaze behaviour.	Not supported	P = .9185
H4	Familiarity negatively affects time of completion.	Not supported	P = .8909
H5	Positive emotional valence positively affects intention to reuse.	Partially supported	(perceived) p = .1013 (physiological p = .0117
H6	Positive emotional arousal positively affects intention to reuse.	Not supported	(perceived) p = .07 (physiological) p = .3923)
H7	Higher exploratory gaze behaviour negatively affects intention to reuse.	Not supported	p = .2387
H8	Shorter time of completion positively affects intention to reuse.	Not supported	p = .251
H9	Positive emotional valence positively affects satisfaction.	Not supported	(perceived) p = 0.9084 (physiological) p = .9084
H10	Moderate emotional arousal positively affects satisfaction.	Not supported	(perceived) p = .7126 (physiological) p = .2899
H11	Higher exploratory gaze behaviour negatively affects satisfaction.	Not supported	p = .1479
H12	Shorter time of completion positively affects satisfaction.	Not supported	p = .3088
H13	Positive emotional valence positively affects word-of mouth intentions.	Not supported	(perceived) p = .3632 (physiological) p = .6367
H14	Moderate emotional arousal positively affects word-of-mouth intentions.	Partially supported	(perceived) p = .8265 (physiological p = .049
H15	Lower exploratory gaze behaviour positively affects word-of-mouth intentions.	Not supported	p = .4469
H16	Shorter time of completion positively affects word-of-mouth intentions.	Not supported	p = .8377

Chapter 4: Discussion

4.1. Summary of results

To summarise, we have not been able to verify most hypotheses. Only H5 and H14 were partially verified. Overall, the familiarity did not affect the experience of users in the context of this study.

Regarding H5, only the physiological valence was verified and regarding H14, only the physiological arousal was supported. This indicates that, respectively, a positive emotional valence will positively affect the intention to reuse, and a positive emotional arousal will positively affect the word-of-mouth intentions.

Most hypotheses were not verified. A first reason that could explain this is the fact that most tasks were rather easy and short and could, in theory, be finished in less than a minute, which might not be enough to identify a significant enough variation. Except for one participant, the success rate was consistently at least at 71% (10/14). Regarding the time of completion, the shorter task had a median time of completion of 18,05 seconds and the longest task had a mean time of 116,9 seconds. Only 5 tasks had a mean time above 1 minute.

A second reason that would explain this is the fact that, if no major difficulty or likable feature is encountered, there should not be a reason for the participant to feel strong emotions, whether they are positive or negative. Using an interface with similar design and functions will not lead to a big change in emotions (Moghaddam et al. 2023).

4.2. Theoritical contributions

Despite the many studies that have been done on the subject, there is surprisingly little research on familiarity specifically related to how customers use account interfaces. Moreover, the effects of familiarity on user emotions and behaviors are not typically examined in this area of research. This thesis seeks to explore this topic in a new way and from a different perspective. However, it is important to note that most of the hypotheses were not confirmed.

According to the two verified hypotheses: a positive physiologic emotional valence positively affects the intention to reuse (H5) and a positive physiologic emotional arousal positively affects the intention to recommend (H14).

Regarding H5, our results established a direct relationship between emotional valence and the intention to reuse in the context of our study. This linked was tested after establishing a relationship between emotional valence and pleasure and a relationship between pleasure and intention to recommend (Rejón-Guardia, 2024).

Regarding H14, our results established a direct relationship between emotional arousal and the intention to recommend. We also have been able to start to refine the findings from previous findings that emotions and intention to recommend are linked (Lucia-Palacios et al., 2020). We were able to verify at least one specific variable related to emotions in the context of our study.

4.3. Managerial implications

The findings presented in this thesis offer interesting insights into the process of transitioning from an old interface to a new one. They suggest that, after switching to a new interface, new users can use it similarly to familiar ones. Additionally, the results from this study can be used to emphasize the importance of creating user-friendly interfaces. Despite the lack of significant results, this study suggests that a user-friendly interface can help compensate for unfamiliarity. This includes its impact on user feelings, actions, and performance while interacting with the interface.

4.4. Limits and proposal for future research

This study harbors two limitations worthy of consideration. Firstly, its scope is confined to the specific context of tasks formulated within the framework of customer account interface usage. Consequently, the generalizability of the findings is restricted solely to this domain. Thus, an intriguing avenue for further exploration would involve investigating how familiarity manifests in divergent contexts.

Secondly, the brevity of the tasks employed in this study presents another notable constraint. Exploring a similar inquiry with extended task durations could offer valuable insights into whether task length exerts an influence on the observed outcomes.

Conclusion

This thesis focuses on the influence of familiarity on emotions and behaviours within the realm of customer account interface usage, aiming to highlight how familiarity shapes user experiences. Its main objective is to offer a fresh perspective on the field of familiarity research, seeking to enrich our understanding of its implications.

The primary aim of this investigation is twofold: firstly, to explore how familiarity operates within a novel context by comparing both familiar and unfamiliar users, employing physiological measures to deepen our insight into its effects. Secondly, to examine how users' interface experiences influence their future behaviours.

We unfortunately were not able to provide answers to our research questions based on our results due to a lack of significative results.

However, this study highlights the importance of user-friendly interfaces in facilitating the integration of new users.

While this study may not have showed significant differences between familiar and unfamiliar user groups. It emphasises the potential of a user-friendly interface in providing comparable experiences across diverse user groups. By emphasizing the role of interface design in mediating user interactions, this research contributes to the broader discourse on user experience and interface usability.

Despite a lack of result for more hypothesis, we were able to establish a direct relationship between the emotional valence and the intention to reuse (H5) and between the emotional arousal and the intention to recommend (H14).

Appendix 1: Visual representation of the experience room setup and data collection tools.

NOLDUS (OBS+MR+BIOPAC) + TOBII
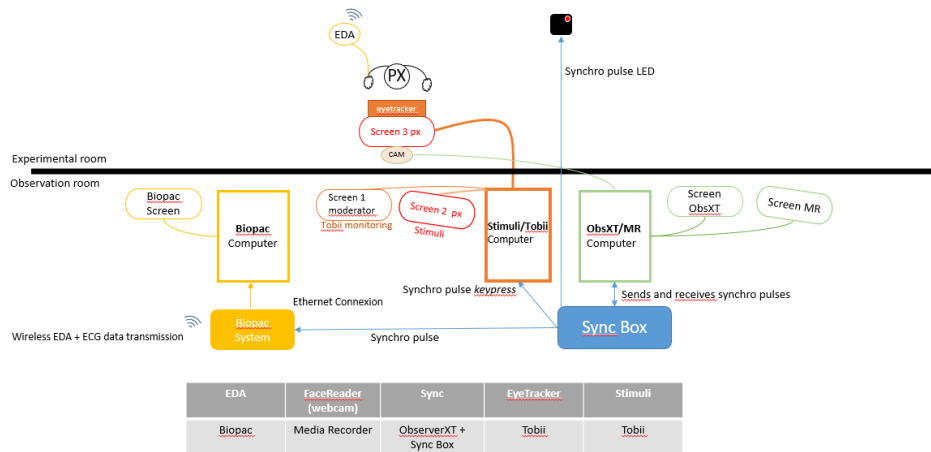
This image shows the set-up of the study room. You can see at the top the experimental room with emplacement of the participant wearing the EDA, the emplacement of the computer used for the tasks and the emplacement for the synchro pulse LED. Then, in the observation room, you can see all equipment used for the data collection and finally, at the bottom, every tool used and the variable associated to this tool.

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