



 LOUVAIN
RESEARCH INSTITUTE
IN MANAGEMENT
AND ORGANIZATIONS

WORKING PAPER

2021/12

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Working Paper Series

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The role of affective consumer responses in the understanding of the gestural interaction experience

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Summary

Gesture interaction became one of the trending topics in human-computer interaction. This new modality is now starting to be used everywhere (Daugherty et al., 2015) and provide individuals a global richer experience than with classical user interfaces (Vanderdonckt & Vatavu, 2018). This is a significant asset when we know that a good customer experience (Lemon & Verhoef, 2016) makes a person five times more likely to recommend a company and more likely to purchase in the future (Yohn, 2019). However, there is currently a great lack of user-centric approaches. The performance of a system is usually measured with usability (Nielsen & Levy, 1994), which includes purely rational dimensions, while it is now accepted that consumers are not necessarily rational decision-makers (Holbrook & Hirschman, 1982). By not taking into account experiential and affective aspects of the interaction, we have an incomplete and biased vision of the performance of such systems, and particularly in the case of gestural interaction (Hassenzahl et al., 2010). Even if different forms of experience exist in the literature in marketing and human-computer interaction, the role of the affective aspects of the experience in the particular case of gestural interaction is still unknown. To address these gaps, this research aims to explore the experience underlying gestural interaction by conducting in-depth interviews and observation phases with customers. The contributions of this research are threefold. First, we extend prior research on the gestural interaction experience by observing the key role of affective dimension in consumers' responses. Then, we shed light to more specific elements such as intuitiveness, perceived control and immersion. Lastly, we show the crucial role of gestural interaction experience in particular touchpoints of the customer journey and consequently on the consumer experience, specifically in the case of impulse buying.

Keywords : consumer experience, gestural interaction, affective consumer responses

JEL Classification: M31, O33, L81

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1. INTRODUCTION

Nowadays, creating a positive experience is a key source of competitive advantage (Lemon & Verhoef, 2016). A good experience makes a person five times more likely to recommend a company and more likely to purchase in the future (Yohn, 2019). Besides, gesture interaction (Daugherty et al., 2015) technology appears as a promising way to provide individuals a global richer experience than with classical user interfaces (Vanderdonckt & Vatavu, 2018).

However, the performance of a gesture-based system is usually measured with the usability (Nielsen & Levy, 1994), which includes purely rational dimensions. By not taking into account experiential and affective aspects of the interaction, we have an incomplete and biased vision of the performance of such systems (Hassenzahl et al., 2010). In addition, we currently ignore the impact of this type of interaction on certain dimensions such as the immersion, while it is particularly interesting in the case of online shopping sites and consumption in general.

In this study we illustrate how this type of technology can be particularly interesting to improve the consumer experience on a website. Specifically, we first highlight the specific elements of gestural interaction in the consumer experience, with a focus on the affective dimension. Second, we try to get a better understanding of the role of the gestural interaction experience on purchasing and consumption practices. In order to do so, we mixed qualitative methods with in-depth interviews and deep observation phases with consumers.

2. PROBLEM AND RESEARCH QUESTION

Gestural interaction with an information system consists of relying on any meaningful movement by any human body to control a computer-based information system (Kendon, 2004): it could be a 2D surface gesture issued by a finger on a smartphone, a 2D1/2 gesture of someone's hand moving space and projected onto a screen, or a full-body 3D gesture issued in space (cf. Figure 1).

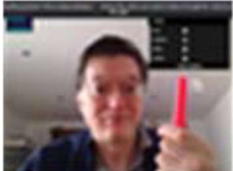
	2D gesture: movement of a human body part (e.g., the finger) or of a device on an interactive surface, such as a smartphone, a smartboard or a screen.
	2D1/2 gesture: movement of a human body part performed in space (3D) but projected on a surface (2D).
	3D gesture: movement of a human body part performed in space (3D) and treated as such.

Figure 1: Examples of possible gestures with a computer system

Gesture interaction remains one of the last human senses subject to fundamental challenges in terms of its appropriate exploitation in mainstream product and services development. More physical/digital products and services already or will support gesture interaction for several reasons (Saffer, 2008): human beings naturally produce large sets of gestures conveying different meanings, interpretations, and purposes depending on their context of use ; gestures belong to our human native, natural, and intuitive interaction; gestures can eliminate physically operating devices like mouse or keyboard; in a multimodal context, gestures provide a richer user experience than with classical user

interfaces (Vanderdonckt & Vatavu, 2018); gestures are used everywhere (they are ubiquitous) in any domain.

Yet, the current methods for assessing the quality of the experience following a gestural interaction are restrictive. In this specific case, usability is not enough: the entire holistic experience should be taken into account (Hassenzahl et al., 2010), thus including affective dimensions. However, existing studies tend to focus on only some properties, for example, memorability (Nacenta et al., 2013), discoverability (Wobbrock et al., 2005) or ergonomics, but they do not integrate their results in a holistic framework, do not take into account the context of use and do not address any aspect of the affective response of individuals. It is in particular for this reason that, although the human-computer interaction literature refers to the individual as a "user", we will also use the term "consumer", specific to the marketing literature, given our desire to take into account the context. Therefore, several questions remain unanswered:

- What elements specific to the affective response of individuals are relevant to address in the case of gestural interaction? To answer this question, we first have to investigate the potential contribution of affective responses of individuals to gestural interaction experience. Then, we will have to elicit what particular elements are relevant to more specifically address gestural interaction experience. While doing our analyses, it will be important to adopt a holistic view of consumer experience and take into account the context of use.
- What is the role of the gestural interaction experience on purchasing and consumption practices? We are now in a context where it is more than common to make purchases using the smartphones, therefore gesturally interacting via the touch surface. We can also consider that every interaction with an interface represents a key touchpoint in the customer journey (Lemon & Verhoef, 2016), and therefore plays a role in the consumer experience. However, we still know very little about the consequences of this type of interaction on consumption practices. Once again, it will be important to take the context into account while answering this question.

To gain a better understanding of the process underlying gestural interaction experience, and specifically the importance of the affective dimensions, we adopted a qualitative research methodology and conducted in-depth interviews and observations sessions in context. In-depth interviews particularly aim to uncover rich knowledge of customer perceptions, opinions, and motivations (Rubin & Rubin, 2011; Stokes & Bergin, 2006) and enables us to move away from classic human-computer interaction frameworks. Observations provide additional knowledge on unconscious role of gesture interaction in context during the customer journey.

3. THEORETICAL BACKGROUND

In this chapter, we will develop our theoretical background for two important literatures intervening in this paper. The first is the consumer experience, present in marketing and more particularly in consumer research. The other important literature is the gestural interaction, and more particularly the resulting experience, coming from the discipline of human-computer interaction.

3.1. Consumer Experience

The consumer experience appeared in the 80th with the emergence of the consumer research as a new discipline. In the latter, consumers began to be seen as non-rational beings and researchers started to consider the emotional aspect in the relationship between an individual and a company. This later resulted in the apparition of experiential marketing and, today, different research streams exist, some preferring to use the term of "customer experience" and others the "consumer experience". The major authors for the consumer experience are Holbrook and Hirschman who, in 1982, developed the consumption experience. They then carried out several works specifying this postulate (Holbrook, 2006).

Although there is no widely accepted definition, we can describe the consumer experience as directed toward the pursuit of fantasies, affect, and fun (Holbrook & Hirschman, 1982). It depends on the object with which we are interacting, the preferences of the consumer, and the situation in which

this interaction occurs. It has the particularity of focusing more on the personal meanings of the consumption experience and tends to be studied in naturalistic settings. It is also very common to study its antecedents and outcomes (Antéblan et al., 2013). We are here in an approach of understanding the consumer as an individual who is not necessarily a rational, information-driven, utility-maximizing decision makers.

This concept is often assimilated to the customer experience, with which it shares the same origin (Sellier et al., 2021) of the consumption experience of Holbrook and Hirschman (1982). However, the specific term “customer experience” was first introduced in 1998 by Pine and Gilmore. Although it is traditionally related to service marketing, it is now starting to be used in human-computer interaction (Rusu et al., 2018).

A popular definition of the customer experience is the one from Lemon & Verhoef (2016), developing that it is the totality of a person’s responses from every interaction he has with a company during the customer journey. It is now considered an essential marketing tool to handle to ensure the competitiveness of a company (McGall, 2015). The particularity of the customer experience is that it integrates several points of contact during the customer journey, and thus specific interactions. A popular measurement method is to use the customer’s feedback and perceptions during his journey. It is now accepted that the customer and consumer experience are subjective and context-specific (Becker & Jaakkola, 2020).

3.2. Gestural Interaction Experience

We usually consider that the discipline of human-computer interaction appeared in the 1980s. During this time, the researchers mainly focused on creating systems, and more particularly interfaces, that were easy to use and easy to learn. With the continuous improvement of motion-sensing technologies (LaViola, 2013), we observed a shift towards more natural user interfaces (Baudel & Beaudouin-Lafon, 1993) taking benefit of these technologies, and in particular gestural interaction. This subcategory evolved over time but, while researchers in human-computer interaction are now more interested in the implementation and recognition of 3D gestures, 2D touch surface interaction is still the most influential type of interaction covered in this literature (Villarreal-Narvaez et al., 2020).

There are two main aspects to differentiate in the discipline of human-computer interaction: the development part, conveying the creation of interfaces and in this case the recognition of gestures, and the evaluation part of these interfaces. For this second aspect, which we focus on in this paper, the usability has been and still is one of the most popular indicators used by researchers and practitioners. This construct includes the dimensions of effectiveness, efficiency, and satisfaction (Sauro, 2015), therefore cognitive and rational dimensions.

Some researchers consider that these dimensions have become too restrictive to assess users’ preferences, and especially in the context of gestural interaction (van Beurden et al., 2012). To overcome this problem, some specialists started to use the user experience, which extends the dimensions of the usability (Poushneh & Vasquez-Parraga, 2017). It is officially defined by ISO 9241-210 (2010) as “A person’s perceptions and responses that result from the use or anticipated use of a product, system or service”. The preferred mode of evaluation is the use of a simple multi-item questionnaire (Sellier et al., 2021). However, the user experience is still restrictive on its human aspects as its final purpose remains to evaluate the quality of a system.

Therefore, the specific term “gestural interaction experience” that we adopt in this paper reflects our desire to study the interaction with a gesture-based user interface in a more holistic context, including affective dimensions. We therefore borrow the theory and the methods of the consumer experience literature to apply to the case of gestural interaction. Regarding this transdisciplinary approach, we adopt a qualitative approach centered on the consumer and carried out in a naturalistic environment, taking into account the context of use.

4. METHODOLOGY

We conducted online 15 in-depth interviews with informants to collect data in natural settings (Miles & Huberman, 1994) and in order to adapt to the health crisis of covid-19. All the sessions were conducted by the same interviewer to ensure consistency (Riedel et al., 2018). We developed a thematic

interview guide based on the literature review (Miles & Huberman, 1994). Although the guide provided some structure, we conducted interviews in a thematic manner to enable informants to communicate their perceptions about some predefined topics while letting them discuss other topics that were not included in the interview guide (Rubin & Rubin, 2011).

In order to triangulate the methods, we combined these interviews with two observation phases. The first took place with the same interview participants once the interview was over. During this part, the candidate interacts with the touch screen of his smartphone by browsing the IKEA site. This observation phase is also followed by a quick debrief. The second observation takes place in another study carried out a posteriori with 35 different participants. As part of the latter, we built an interface based on the IKEA website and functioning by interacting with mid-air hand gestures, via the LeapMotion controller. During these sessions, participants first have the opportunity to freely explore the interface before seeing a tutorial explaining the gestures and corresponding actions. They then perform an experiential task and, once the interaction session is over, they are questioned about their experience. The use of these different observation phases, in addition to the interviews, offers a greater generalization of our results to gestural interaction, regardless of whether it is in 2D or 3D.

Once all our data collection phase was over, we used thematic analysis to analyze and interpret the corpus of data, via the NVivo 11 software. Thematic analysis is a method that identifies, analyses, and reports patterns (themes) within data to obtain a rich and detailed description of it (Boyatzis, 1998; Braun & Clarke, 2006). The analysis was both deductive and inductive (Valos et al., 2017) by adopting a “theory-driven” approach, with themes and codes identified in prior literature and a “data-driven approach” with other codes emerging from the data (Braun & Clarke, 2006).

5. RESULTS

In this chapter, we will develop the results of our analyzes of the interviews and observations. We will first see the importance of the intuitiveness in the gestural interaction and the immersion as a solid indicator of the quality of the experience. Thereafter, we will move to other aspects of the affective response of the individuals such as the trust, anxiety and satisfaction.

5.1. Intuitiveness, a critical component of gestural interaction

A first observation regarding gestural interaction is that there is a very mechanical and intuitive side to it, especially for people comfortable with technology. As an illustration, we have the following testimony, during the simulation phase on a smartphone, on the IKEA site. During this exercise, the person completed the requested task quickly and without ever really thinking. We observed a certain habit of the action but also of navigation on a smartphone.

“I open Safari, I type in the search bar "ikea" ... I click on the first link since it is their site. Above that I have the bar "what are you looking for?", I click on it and I type “lamp”. [...] I close the bottom page which offers me to configure cookies etc. I click on the cross directly; it does not interest me. And there I scroll; I look at the lamps that I like.” Arnaud | M | 25

The intuitiveness is a factor already widely used in the literature on gestural interaction and is defined as the degree to which a gesture refers to existing knowledge (Raskin, 1994). Some authors argue that gestural interaction is intuitive and natural because it is based on the gestural communication that humans acquire naturally (Baudel & Beaudouin-Lafon, 1993). It is important to note that we are talking about a learning process and not a pre-established language that we are trying to mimic. For example, the "pinch to zoom" movement is not based on an existing movement but was created from scratch and yet is considered natural and intuitive (Wigdor & Wixon, 2011), as we have also noted during our sessions. The intuitiveness is therefore subjective and dependent on the knowledge and experiences of each person.

This observation was also confirmed in the post-scenario debriefing. Several participants confirmed the possibility of being able to "juggle" easily on a smartphone, so to navigate naturally to carry out several actions easily. Having intuitive and natural gestures is so important that it is now one of the requirements of consumers. They expect to find the same standards regardless of the websites and platforms.

“When we are on the phone it is sure that there is still the ease of being able to juggle, hop I go back, I look at the same photo for the third time, I enlarge it.” Jeanne | F | 31

“To zoom it's very practical, I mean it works like all websites.” Arnaud | M | 25

We can explain those reactions by the desire of consumers to exercise control at all stages of the service process (Bateson, 1985; Van Raaij & Pruyn, 1998). Tyler (1989) argues that people's desire to have control over a decision-making process is not simply as means to achieve fair outcomes. We can also link this to the Pleasure-Arousal-Dominance model (Mehrabian, 1996) in which the 3rd dimension opposes having control and feeling controlled (Coutrix & Mandran, 2012). The consumer must therefore feel in control with his gestures or otherwise he will have the impression that it is rather the system which controls him, which will impact his experience from an emotional point of view.

A particularly interesting testimony is that of Grégory, a participant very comfortable with technologies. He explains that the ideal controller would be to be able to use his movements in a very natural way, which would even enable easy interaction for people who are not used to this. In the Technology Acceptance Model (Davis, 1989), the perceived ease of use is one of the main factors influencing the experience. People therefore seek the most easy and natural interaction possible, namely gestures, and it provides them a richer experience than with classic user interfaces.

“In terms of controls I think things are getting better and better, where obviously the best would be to be able to just use your fingers in a very natural way. [...] But otherwise, [gestural interaction] is easier if you're not used to it. If you put a grandmother in front of virtual reality and she can just catch an object, she will understand how to catch an object; if you put her in front of a pc, she will not understand what is going on.” Grégory | M | 24

However, as we can see from the following testimonial, the smartphone is not always considered the most convenient and easy option. The following participant explains that he prefers to use his fingers via his smartphone but, for more "advanced" tasks, he prefers the computer. We can explain this with the PAD model and its dimension of being in control vs being controlled (Mehrabian, 1996). When it comes to performing a more “advanced” task, participants feel less in control with their smartphone's touchscreen and therefore prefer to use their computer, even if that means losing a little practicality and the intuitive interaction.

“Ah me, I prefer all gestures with the fingers. On the other hand, everything that is word processing and everything that is a little more, I will say advanced, Excel on smartphone for example, I would never use. But for all that is websites I prefer, I think that with my fingers it goes faster than with the mouse. I suppose that with a pc you have to click right or left to go from one photo to another while here it is fluid” Arnaud | M | 25

Some participants also have an overall preference for the computer rather than the smartphone, whatever the task. The people with this preference tend to be those less comfortable with technology, the others generally preferring the smartphone. This can be explained by the intuitiveness of the gestural interaction and the fact that it depends on the participant's existing knowledge (Raskin, 1994). Those who are more comfortable with technology have a better knowledge regarding it and tend to experience a more intuitive interaction. They therefore feel more easily in control when using their smartphone and have a better overall experience, which explains their overall preference for the smartphone.

However, we have two notable exceptions of participants who are very comfortable with technology and prefer their computer rather than their smartphone. This could be explained by their jobs, respectively AI developer and accountant, making them our participants working the most with their computer. Their perceived control is therefore higher with their computer than with their smartphone, which impacts their overall preference. We would also explain this with the Technology Acceptance Model (Davis, 1989). Their intensive use of "advanced" features on computers means that their perceived ease of use of the computer is higher and that they therefore have a better overall experience with it than with their smartphone.

“I am used to working on my computer. Since I was 18, I've been doing stuff on the PC where I code, I do graphics, that kind of stuff” Grégory | M | 24

5.2. The link between intuitive gestural interaction and impulse buying

Another interesting aspect related to this intuitive interaction is its connection to impulse buying. First of all, we can define impulse buying as a sudden and immediate purchase with no pre-shopping intentions (Piron, 1991). It has been described as an unplanned, compelling, and hedonically complex purchasing behavior (Chan et al., 2017). Due to its impulsive nature, the affective plays a major role in this type of purchase, which can even stimulate an emotional conflict (Rook, 1987).

During our sessions, a participant described making this type of purchase because she does not realize that she made a few intuitive movements to select some products and pay. She also gives a concrete example of the Wish website, on which a simple movement is necessary to pay, giving the impression that she has just swiped, not paid.

“It's so easy because you sit down and you get bored and then finally you ticked two little boxes and there is that feeling of... intangible. We do not realize that we have slipped a finger. So I love the Wish website, it's great because [...] when you arrive at the end of your basket, there is a little line that says "swipe to pay". And so it's great because you swipe, you pay, since your card remain memorized in the program, and we have this feeling that well we just swiped, we did not really pay.” Julie | F | 39

One of the ways we could explain the link between gestural interaction and impulse buying is through the presence, which refers to the sense of a product being present with a consumer in his or her own environment. It has been shown that the vividness and interactivity of some websites features increases this presence (Ning Shen & Khalifa, 2012), which in turn influences the desire to buy impulsively (Vonkeman et al., 2017). In our case, we can consider that the gestural interaction is one of these features, which would explain our observations and the statement of Julie buying impulsively on the Wish application.

We were also able to observe during the scenario several cases of people navigating intuitively on the IKEA site and, after having virtually manipulated a product (for example by zooming in to see details), declared to be very happy with the product, some even considering buying it. It has been shown that merely touching a product increases the perceived ownership of this product (Peck & Shu, 2009), which in turn influences its valuation. The consumer will then tend to buy the product more easily if he feels that its perceived value is greater than its price. What is particularly relevant in our case is that it has been shown that virtually touching a product also has this effect of influencing the perceived ownership (Peck et al., 2013; Brasel & Gips, 2014), and therefore increases the valuation of the product.

5.3. Anxiety, trust & perceived reliability

As with all technologies, some people experience angst or even anxiety while interacting with a computer system. This phenomenon was perceived more in the observation phases than in the actual interview of the candidates. This feeling manifested itself mainly through apprehension when explaining to candidates the task at hand. This state of mind was particularly marked for the candidates who were less comfortable with technology.

Once the scenario was finished, although some people encountered several difficulties, all said it was actually easy. According to Werner et al. (2020), people with strong gerontechnology anxiety (i.e. the anxiety linked to technologies and perceived by users that are generally older) benefit significantly from a quick training of gestural commands. In our case, participants feel more comfortable after completing the task than before because they have been able to "practice" by doing it once and would feel more comfortable if they had to do it again.

This also shows us that ease of use is a subjective feeling as some people, often less comfortable with technology, are used to having to put in a lot of effort and experience difficulties in getting to their ends. It is for this reason in particular that in the Technology Acceptance Model (Davis, 1989), we speak of “perceived” ease of use and not “absolute”. However, the amount of effort required still played

a role as the candidates who had more difficulties still generally had bad experiences, even though they said it was easy. Again, this could be explained by the fact that people who are less comfortable with technology generally have less knowledge and experience of it, which makes the interaction less intuitive, a weak sense of perceived control, and the overall experience less good (Davis, 1989).

During our sessions, we were also able to note that more anxious people seem to be more easily satisfied with living a "normal" situation with a technology, where other people would be neutral. For example, we have the following two testimonials in which the first person, more anxious, declares having had a good experience because her order went as planned, while the second is neutral.

“The good experiences are all the things that I received by delivery, for example Amazon, which corresponded well to what I expected.” Christelle | F | 57

“I mean, what I ordered, it arrived on time, it was the quality that was described and then voila, I had no good or bad surprises.” Fabien | M | 21

However, despite this declared higher satisfaction, anxiety and lack of control seem to take over the overall experience, as we had in our case with Christelle who did not have a good experience. Therefore, the satisfaction taken alone is not a foolproof indicator of the quality of the experience, at least if it is not combined with a "fun" or "enjoyment" aspect.

Regarding the origin of this anxiety, Mehrabian (1996) explains with the PAD model that anxiety-related traits are caused by non-pleasure, high arousal, and a feeling of not being in control. The link with the 3rd dimension has already been established several times in this paper and was particularly striking for Christelle, who even told us that she generally does not like new technologies since she always needs to control everything.

“It's because I always need to be in control.” Christelle | F | 57

For the first dimension of the PAD, the pleasure, we were not able to observe any perceived enjoyment during the observation phase. Regarding the arousal, Christelle was very attentive and her first reaction was always to be suspicious, which therefore corresponds to the profile linked to anxiety established by Mehrabian (1996). This was observed in her sayings during the interview and confirmed during the observation session. This observed suspicion also enables us to link this loss of control to the trust she is ready to grant, which here tends to be quite low.

“I am still a little wary despite everything on this kind of platform. It still scares me a little, I'm too suspicious in fact, too anxious.” Christelle | F | 57

“I find that sometimes the evaluations are so positive that it may be too good [to be true].” Christelle | F | 57

We also had opposite examples of participants who had full trust in a brand and therefore had no problem accepting cookies on the website, when in normal times they were more reluctant. It should also be noted that these two participants both had good overall experiences during the scenario. This is particularly marked for Jean who describes himself as a "won customer" for IKEA and who, following a bad experience with a competing chain of stores, says he no longer wants to set foot in those other stores.

“He asks to accept cookies. As it is IKEA, I do it, because I trust them, I have already been a customer on several occasions.” Jean | M | 43

“When it comes to sites like this, I don't question myself, I just accept it directly. When I go to sites that I know a little less about, I may be more inclined to refuse.” Julie | F | 39

We can link these observations to the perceived reliability, defined as a user's subjective impression of how much confidence he can place in the system (Rose et al., 2012; Sauro, 2015). We see that some people trust the interface (in this case the IKEA website), which they perceived to be

reliable, and tend to have a better overall experience. Therefore, the perceived reliability and trust also emerge as important elements for a good experience with a computer system.

5.4. Immersion, a solid indicator of the quality of the experience

Although all the participants chose the product they wanted to search for on the IKEA website, only a part really needed the product, the others choosing at random. A first observation is that people who really needed the product have had a better overall experience than others, regardless of the level of comfort with the technology. This may therefore suggest that the perceived usefulness of the interaction plays a role in the experience, as suggested by the Technology Acceptance Model (Davis, 1989). For example, Grégory didn't need the product at all and if he did, he wouldn't have looked for it on this site anyway. Although he is the most comfortable person with technology, he has not had a good experience. He is the only participant who found the website to be rather poorly made and tended to use a lot of irony or even cynicism.

“I open a piece of furniture at random, I come across a 404 page. There it is really a very enriching experience” Grégory | M | 24

When we focus on people who had a good experience, we notice that a common trait is present in their behavior while performing tasks: the immersion. This factor can be defined as “the extent to which the computer displays are capable of delivering an illusion of reality to the senses of the human participant” (Slater & Wilbur, 1997). It appears in any case in which an individual is plunged, involved or absorbed in a totally different world (Fornerino et al., 2006). It can range from partial to total, and even until a state of “flow” is reached (Fornerino, et al., 2008; Hoffman & Novak, 1996; Novak et al., 2000). This last factor describes the state of mind of individuals psychologically absorbed in the activity they perform (Nakamura & Csikszentmihalyi, 2014). It is often characterized by inattention to time and circumstances surrounding the individual. In our sessions, the majority of the participants who had a good experience tended to seem more absent, leave blanks longer than in the rest of the session and even sometimes start sentences without finishing them. It was particularly striking for some participants who, during the interview part of the session, tended to talk a lot and not leave blank, whereas here it was the opposite. This link between immersion and good experience has already been noted in the literature and there are several claims that the immersion is the “heart of the experience” (Charfi & Volle, 2011; Poncin et al., 2015).

We could imagine that these traits were due to the concentration required to perform the given tasks. However, they have been observed in people less comfortable with the technology, but also in participants more comfortable. We also had cases of people who are uncomfortable with technology and who did not have such phases, such as Christelle. Therefore, the required concentration alone doesn't explain these moments of absence.

There are also several reasons to believe that these phases of immersion are at least partly due to the intuitiveness of the gestural interaction. One of the first appropriation steps in the immersion process is to relate the codes of the interaction to what the user already knows (Poncin & Garnier, 2012). As gestural interaction is considered natural because it is based on the gestural communication that humans acquire naturally (Baudel & Beaudouin-Lafon, 1993), the gestural interaction has the advantage of allowing more connection with what the user already knows, and therefore to facilitate the immersion. We have also seen that gestural interaction is appreciated for its intuitive nature, and it has also been shown the intuitiveness and fluidity can create a favorable basis for the immersion and virtual experience (Poncin et Garnier, 2010)

Moreover, the notion of immersion was not only observed in the scenario but also present in some of the participant's speeches. As an illustration, we have the following testimony of a participant declaring scrolling for hours on her smartphone and making purchases without too much thought, because a simple gesture was enough to pay. We therefore still find this notion of inattention to passing time, linked here to impulse buying. According to Poncin et al. (2015), the feeling of immersion may be having a positive effect on various responses such as attitudes, satisfaction, and buying intentions.

“When it comes to clothes I tend to sit comfortably in my chair with my smartphone, and then I scroll for hours and choose things that I don't really need, but I choose anyway” Julie
| F | 39

We found that another indicator enabling to assess the quality of the experience was the perceived enjoyment, shown through the apparent emotions of the participants. This factor, already used in different literatures, is a subjective measure of the pleasure the individual takes when using the system. The integration of this dimension has been shown to be particularly interesting in the context of gestural interaction (van Beurden et al., 2012). It is often called "fun" in the consumer experience, of which it is one of the founding pillars (Holbrook & Hirschman, 1982). It is also present in the PAD model and it represents what the consumer is ultimately looking for.

The absence of perceived enjoyment was particularly marked among the participants who chose a piece of furniture at random, who tended to remain purely descriptive in the actions they carried out and not to show any particular emotion. However, some of the participants tended to stay in the descriptive without involving emotion during the whole session, which made it not necessarily easy to assess their perceived enjoyment during the scenario. For this reason, the traits specific to the immersion were globally easier to identify and represented a better indicator of the quality of the experience. It may be explained by the fact that the gestural interaction is subjective and dependent on each individual (Archer, 1997). For example, when performing gesture elicitation studies, older people tend to prefer semantic gestures (imitating somethings of the user's reality) while younger people use abstract gestures (representing abstract drawings) more often (Lambillotte et al., 2017). There are also cultural differences when performing gestures. As an illustration, it has been shown that Germans tend to use more gestures than Koreans, and that they show more emotions when performing them (Kim & Lausberg, 2018).

6. DISCUSSION

In this chapter, we will present our results, confronted with the human-computer interaction and marketing literatures. It is divided into 2 parts, each corresponding to the main research questions. We will first develop the importance of the affective consumer responses in the gestural interaction experience. Next, we will focus on the role of the gestural interaction experience on consumption and purchasing practices.

6.1. The importance of the affective response in the gestural interaction experience

We first observed that people who chose to search for an item that they really needed tended to have a better overall experience. These people saw an opportunity to complete a task that was really useful to them, confirming the link between perceived usefulness and quality of experience (Davis, 1989). Regarding the other factor pairing with the usefulness, the ease of use (Davis, 1989), we saw that the gestural interaction has the advantage of being more intuitive and therefore makes easier to interact with an interface.

However, this feeling was not shared by everyone, and mainly for participants less comfortable with technology. Some people see new technologies as a loss of control on their part, thus increasing the feeling of being rather controlled by the system (Coutrix & Mandran, 2012), which tends to provide a poorer experience. These participants are those with a tendency to experience anxiety, characterized by an absence of pleasure, a feeling of not being in control and a high arousal. They also do not easily give their trust, unlike some others who have a high brand confidence and therefore perceive their website as reliable (Rose et al., 2012; Sauro, 2015), positively impacting their overall experience.

One statement that was common to all participants was that the tasks were actually easy, although some had a lot of difficulty. For those people, the fact of carrying out these tasks serves as training and improves their knowledge in terms of interaction, which has a positive impact on the feeling of intuitiveness of the interaction. This then has a positive impact on the feeling of perceived control, which is a dimension to which we have often come back in this paper. This affective dimension enables us to explain a lot of observations we made and has a clear and direct impact on the gestural interaction experience.

We found that a factor that made it possible to quickly assess the quality of the experience was the traits specific to the perceived immersion of the participants, observed through the inattention to time and circumstances surrounding the individual. Indeed, participants having a good experience were more likely to leave blanks, keep their eyes on their smartphones or start sentences without finishing them. Some authors even consider immersion to be the “heart of the experience” (Charfi & Volle, 2011; Poncin et al., 2015).

We have seen that this state is particularly relevant to address in the context of gestural interaction. Indeed, in the first appropriation step of the immersion process, the user relates what he experiences to what is familiar to him (Poncin & Garnier, 2012). Since the gestural interaction is natural (Baudel & Beaudouin-Lafon, 1993), it makes it possible to reach this stage of immersion more quickly. Another explanation is via the high intuitiveness of the gestural interaction, also having a positive impact on the immersion (Poncin et Garnier, 2010).

6.2. The impact of the gestural interaction experience on impulse buying

In this work, we have placed our sessions under the theme of purchasing, allowing us to directly study the context of use. An important phenomenon that we have observed during our sessions is the link between the gestural interaction experience and impulse buying. The topic of online impulse buying is increasingly studied (Chan et al., 2017), given its importance. It is estimated that about 40% of all online consumer expenditure is attributable to these types of buying (Liu et al., 2013). However, the specific aspect of the gestural interaction has been starting to be studied only recently (Liu et al., 2019).

During our sessions, we were first able to observe a link between immersion and impulse buying, in particular via the example of the participant scrolling for hours to buy things that she does not need. We have also seen a connection between these purchases and the intuitive nature of gesture interaction. The latter was explained through the presence (Ning Shen & Khalifa, 2012; Vonkeman et al., 2017) which would be increased within the framework of this gestural interaction, but also via the perceived ownership which increases the perceived valuation of an object by touching it virtually (Peck & Shu, 2009; Peck et al., 2013; Brasel & Gips, 2014).

Figure 2 summarizes the process highlighted in this work. Intuitive gesture interaction has a direct impact on the experience. We also observed the role of perceived control and reliability on this relationship. In a second part, we linked this process to impulse buying, impacted by perceived usefulness and ease of use.



Figure 2: Diagram of the process highlighted in this work.

7. CONCLUSION

Gestural interaction with a computer system is a very promising modality of interaction. However, there are several challenges to overcome in order to fully embrace this technology, the main one being the current ignorance of the affective response of individuals. We therefore asked ourselves the questions “What elements specific to the affective response of individuals are relevant to address in the case of gestural interaction?” and “What is the impact of the gestural interaction experience on purchasing and consumption practices?”.

In order to answer these, we first developed our theoretical background, drawing on the literature from marketing and human-computer interaction. We then moved on to the methodology we have adopted. After that, we developed the results that emerged. We mainly described the importance of the intuitiveness, its link with impulse buying, and also the case of trust, anxiety and perceived reliability. These findings were confronted to the literature in human-computer interaction and marketing, allowing us to answer to our two research questions. For the first one, focusing on the affective response of individuals following a gestural interaction experience, we have highlighted the

role of the perceived control, impacted by the intuitiveness of the gestural interaction and having a major effect on the feeling of immersion. We then showed the effect of intuitive gestural interaction on impulse buying, whether through the enhanced immersion or through the theories of presence and perceived ownership.

It should be borne in mind that this study has several limitations. As a main one, we decided not to make different observations over time and to opt for a diachronic point of view. This would however be an interesting work to carry in a future study, whether it is to study a potential learning effect in gestural interaction or to study consumption aspects via multiple touchpoints of the customer journey.

From a theoretical point of view, this work highlights the importance of affective consumer responses in the understanding of the gestural interaction experience. We also shed light to specific dimensions such as the intuitiveness, perceived control and immersion, and we propose a model explaining their influences. From a practical point of view, we show the crucial role of gestural interaction experience in particular touchpoints of the customer journey and consequently on the consumer experience, specifically in the case of impulse buying.

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