



Copenhagen Business School

M.Sc. Programme in Brand and Communications Management

Master's Thesis

Impulse Buying Behaviour and Post-Purchase Regret

**An investigation on Emotion-Sensing Technology as a means
to diminish the regret arising from retail therapy in sad
consumers**

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Counting pages: 98

Counting characters: 193.851

Date of submission: 17th May 2021

Abstract

Looking at the way consumers behave has long been of primary importance to marketers in order to anticipate customers' needs and respond to them in the most effective way. Yet, understanding consumer behaviour is neither straightforward nor predictable. Among several factors, sadness plays a distinctive role in influencing people's actions by diminishing their cognitive abilities and, in turn, increasing their impulsiveness throughout the decision-making process. Sad consumers are indeed encouraged to resort to "therapeutical" shopping with the aim of rapidly improving their negative emotional state. However, retail therapy and impulsive purchases have only a short-term positive emotional impact – in the long-term, the irrationality that characterises the consumption may lead consumers to regret their purchase. Post-purchase regret (PPR) represents an ever-challenging aspect, which marketers have to deal with. Among others, it implicates consumers' dissatisfaction towards products, resulting negative word of mouth, and undesired costs for companies.

Since extant solutions to this problem remain scarce and mostly inadequate, the current thesis project has tried to overcome the gap by introducing the use of emotion-sensing technology (EST) as a means to relieve the burden of PPR on consumers and brands. Grounded on a dual-process system model of consumer behaviour, the study embraced an experimental approach in which 23 participants have been induced a baseline of sadness and engaged in a retail therapy activity. By making people aware of their negative emotional state, thereby increasing their cognitive abilities, the presented findings add to the extant literature that EST has the potential to diminish the chance to experience PPR. Since these technologies would significantly enhance the decision-making process of sad consumers during their impulsive consumption, the study recommends marketers to incite the industry advancement of EST application within the daily shopping activities.

Keywords: *Consumer Behaviour, Impulse Buying Behaviour, Emotions, Retail Therapy, Post-Purchase Regret, Emotion-Sensing Technology*

Acknowledgements

We would like to thank our supervisor Rob Gleasure for the precious insights he offered us along these challenging yet memorable past months. Despite the difficulties encountered imposed by the adverse times of Covid-19, he gave us inestimable support throughout the journey of this project. We will make every piece of advice count in our future paths.

We are also thankful to all our friends for their time and commitment during the experimental phases. It was a valuable experience to see how each of them contributed in a singular yet fundamental way to our research.

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List of Abbreviations

ANS	Autonomic Nervous System
CMB	Common Method Bias
CMV	Common Method Variance
EDA	Electrodermal Activity
EEG	Electroencephalography
ERC	Emotion Regulation Consumption
EST	Emotion-Sensing Technology
GSR	Galvanic Skin Response
HR	Heart Rate
IoT	Internet of Things
PPR	Post-Purchase Regret
RIM	Reflective-Impulsive Model
S1	System 1
S2	System 2
WOM	Word of Mouth

1. Introduction

In the following chapter, the topic of the thesis project and the motivation driving the research question are addressed. In particular, after an initial background to set the field of the research, the underlying motives are elucidated, ensued by a presentation of the main purpose of the study. Lastly, an outline of the thesis structure is given.

1.1 Background

Consumers are the most important assets for any brand: they are who companies gain profit from. Consequently, studying how customers behave and choose during their purchasing activities has always been a top priority for marketers in order to understand consumers' thoughts and better respond to them (Lim & Yazdanifard, 2015).

Within the arena of consumer behaviour, the idea that the rationality of decision-making processes is bounded by the constraints of the situation (ref. Simon, 1957) has nowadays been widely acknowledged. As a matter of fact, although most people try to control themselves during purchasing activities, to pursue long-standing goals (Baumeister, 2002), the literature suggested that several factors can reduce the use of cognitive effort and consequent ability to act in a rational way (Vohs & Faber, 2004; Silvera, Lavack & Kropp, 2008). Among others, abundant research proposed that an emotional state is one of the primary stimuli affecting consumer behaviour (Cacioppo & Gardner, 1999; Strack & Deutsch, 2004; Shen & Khalifa, 2012).

By exerting direct and indirect effects on customers, emotions play a significant role in decision-making, firstly by shaping an individual's cognitive capabilities (Hirschman & Holbrook, 1982). In this context, Baumeister, Heatherton and Tice (1994) proved that an altered emotional state leads to a failure in self-controlling. Essentially, the authors revealed that people's propensity to self-control breaks down when experiencing sadness, in turn making them more likely to act impulsively. As a result, sad consumers are more prone to engage in impulsive consumption, as the aim of feeling better takes precedence over long-term self-regulatory goals (Baumeister et al., 1994).

In this regard, the concept of retail therapy has frequently been used to indicate consumer attitude to engage in purchasing activities for the sake of feeling better (Atalay & Meloy, 2011; Rick, Pereira & Burson, 2014). There is indeed a “therapeutic” element in this type of consumption: while shopping impulsively, people tend to experience high-arousal emotions such as pleasure and gratification (Verplanken, Herabadi, Perry & Silvera, 2005).

Nonetheless, extant literature pinpointed that retail therapy has on average only short-term positive emotional impacts (Park & Dhandra, 2017; Tice, Bratslavsky & Baumeister, 2001). Conversely, evidence accounted for a significant association between impulsive purchases and post-purchase regret (PPR), mainly attributed to the consumers’ low level of consciousness when shopping impulsively (Hoch & Loewenstein, 1991; Lisjak, Bonezzi, Kim, & Rucker, 2015; Saleh, 2012).

In this regard, self-regulation theory postulated that human cognition is limited and can vanish temporarily due to instincts or control demands (Samson & Voyer, 2012). For instance, a particular challenge occurs when people are confronted with an immediate urge to buy, referred to as impulse buying (Rook, 1987). Since this desire makes it especially hard for consumers to act rationally (Vohs & Faber, 2004), studies in consumer behaviour have long been interested in the divergence between impulse buying tendencies and human control (Lim & Yazdanifard, 2015), as their conflict may eventually lead individuals to regret their decision (Brocas & Carrillo, 2014).

Applied to the context of retail therapy, Saleh (2012) explained that the feeling of irrationality characterising the decision-making activity leads consumers to be dissatisfied about their purchasing, raising their chances to experience PPR (Inman, Dyer & Jia, 1997 in Saleh, 2012).

1.2 Motivation

Retail therapy has been known for its ability to relieve emotional distress (Rick et al., 2014). Yet, studies have also demonstrated that when consumers choose under unwitting conditions, feelings of regret can easily arise (Strack, Werth & Deutsch, 2006). Considering the link between impulsive consumption (or retail therapy) and negative emotions, and the consequent feeling of PPR, it is of interest to the current project to explore the field of impulse buying behaviour.

This is a topic that the researchers attempt to analyse, as its prevailing impulsive character may act in the opposite direction of consumers' rational judgments and cognitive capabilities, thereby triggering a sense of guilt about their decision (Brocas & Carrillo, 2014). The motives that have determined the foundation and development of this thesis project thus lie in the desire to find answers, investigate extant solutions and come up with potential new ones to the issue of PPR.

The feeling of regret consequent to retail therapy is herein viewed as a matter that needs to be controlled, especially nowadays, since engaging in impulsive consumption is becoming more and more immediate due to the proliferation and easy accessibility to online stores. Particularly, it is a driving reason to address the concerns of companies that find themselves in dealing with customers that negatively associate a regretted product to the brand – leading to drawbacks in terms of brand switching intentions and dissatisfaction (Bui, Krishen & Bates, 2011).

1.3 Scope

After providing a general background of the main field of study, and stating the underpinning motivation behind the thesis, the scope is hereafter addressed in order to set up a clear project line, exclude irrelevant content and thereby achieve the defined objectives. Specifically, the purpose and research question are firstly presented, along with a brief exposition of the study framework, followed by its delimitations.

1.3.1 Objective & research question

Previous studies have found that factors such as sadness, lack of control, and an impulse buying urge are central aspects of a consumer's impulse buying behaviour. However, research into practical solutions remains scarce and mostly inadequate when it comes to the related consequence of post-purchase regret (PPR). In particular, the literature proposed a number of strategies meant to contain the impulsive tendency leading to PPR. Examples included reducing the magnitude of the emotion or isolating the decision-making activity from the emotional response (Lerner, Li, Valdesolo & Kassam, 2015). Nonetheless, the same literature insinuated that these tactics hardly appear to work as they call for individuals to become aware of their emotions (Lerner et al., 2015).

In this regard, different studies have revealed that, when buying impulsively, consumers are characterised by the overarching presence of spontaneous and unconscious mechanisms – appointed as impulsive system (S1) by Strack and Deutsch (2004). This processing system implicates low levels in awareness of both personal and contextual settings (Cohen, Pham & Andrade, 2008; Strack et al., 2006).

Hence, a paradox arises in relation to the extant solutions to impulse buying behaviour and related PPR, which posit the ability of individuals to be aware of their emotional state in a situational context where impulsivity instead prevails. This is perceived as a research gap to be further examined since the effects of PPR represent a severe aspect, which highly weighs on businesses and marketers. Drawing upon the identified paradox, the present thesis project thus pursues filling in the existing gap by proposing a new solution to reduce the sense of regret arising after retail therapy.

Built on the two-system reflective-impulsive model (RIM) developed by Strack and Deutsch (2004), the study objective is to construct and empirically test a framework that examines emotion-sensing technology (EST). In particular, EST acts as a practice that – by raising cognitive abilities and in turn activating the reflective system (S2) in sad consumers – can diminish their likelihood to experience PPR. In line with this reasoning, the research question is posed as the following:

By making them consciously more reflective of their altered emotional state, can emotion-sensing technology decrease the feeling of post-purchase regret arising in sad consumers after retail therapy?

In brief, by embracing the use of EST as a solution to PPR and testing it with a real experiment, the current study aims at providing valuable insights to marketers and consumers while offering both theoretical and practical groundwork to the arena of impulse buying behaviour and related PPR.

1.3.2 Delimitation

In order to answer the research question to the best of one's abilities, it is deemed necessary to present the delimitation of the project as well. In this regard, by adopting a consumer perspective and analysing the process that starts with the arousal of a negative emotion (i.e., sadness), related appraisal of reduced situational control, and subsequent impulse urge to buy, the project aims to research the field of impulse buying behaviour and the associated feeling of PPR.

Within this context, literature has demonstrated that sad consumers often engage in retail therapy as a way to regain control and restore positive emotions. However, this impulsive consumption includes a number of drawbacks, among which PPR. The thesis would like to investigate whether PPR can be diminished when consumers become aware of their negative emotional state. For this purpose, EST is used to monitor the level of sadness in individuals and make them aware of their altered state. Furthermore, an experimental session is used to recreate the situational context of retail therapy, after which the consumers made aware of their emotion would hopefully showcase a reduced level of regret.

1.4 Thesis structure

In the following paragraph, a short outlook of the thesis structure is provided, to convey to the reader an understanding of the procedure of the presented research project. Specifically, this first chapter has introduced the background of the thesis topic, thereby offering a general overview of the central area of interest and the research gap. Furthermore, the motivation of the study has been presented, together with a clear delineation of the objectives and the related research question to be answered. Here, a brief topic delimitation was included in order to better introduce the reader to the thesis project.

In the second chapter, an extensive review of the literature has been addressed to provide a theoretical backbone of the paper while defining specific terminology. In particular, the six areas of (1) irrational consumption, (2) emotions and how they affect consumer behaviour, (3) incidental sadness and appraisal theme of situational control, (4) retail therapy, (5) post-purchase regret, and (6) emotion-sensing technology have been covered and placed in relation to each other.

Subsequently, chapter 3 provided the conceptual framework of the thesis project. Notably, the section started with setting the theoretical perspective of the study by presenting the reflective-impulsive model (RIM) proposed by Strack and Deutsch (2004). The RIM theory has further elucidated the connection between earlier discussed concepts and impulse buying behaviour, thereby guiding the research towards the development of the hypotheses. These were subsequently introduced, along with a visual depiction of the conceptual model proposed.

The fourth chapter discussed the methodology applied to conduct the study. As the current thesis includes different steps and multiple data gathering, it is important for the reader to understand the research method around the project. To this purpose, the chapter was structured according to Saunders, Lewis and Thornhill (2009) research onion model. After firstly introducing the philosophy adopted in the study, the approach to theory development was addressed. This has been followed by a closer look into the research design, including strategy, purpose and time horizon, as well as the methods used for collecting data. Thereafter, both sampling and protocol of the experimental part of the study were described, with a particular focus on the material and procedure adopted. The section ended with an explanation of the approach used to measure and analyse data.

Chapter five touched upon a thorough analysis of the study results, addressed in three separate parts. Initially, the first section provided a descriptive analysis of the experimental session aimed at creating an emotional baseline of sadness. Secondly, the survey results have been deeply explored through a statistical analysis to test and validate the research hypotheses. Finally, the third part included a follow-up test, where two consequent assumptions were developed, and the gathered data examined.

In chapter six, the discussion of the research project has been uncovered. In particular, by taking its departure from a summary of the study, the first paragraph set the results in the context of the literature review offered in chapter 2. Subsequently, the chapter proceeded with an outline of the main contributions to the research, where the hypotheses and additional considerations were examined in light of the primary data collected. The discussion then evaluated the implications for practice under a triple perspective and ended with the current study limitations and suggestions for future research. Lastly, the research project was ultimately completed in chapter seven, presenting a brief conclusion with the main outcomes of the study.

2. Literature Review

The purpose of this chapter is to provide the reader with an exhaustive background of the field of impulse consumer behaviour, emotions, and post-purchase regret, as well as the current state of the literature within the area of emotion-sensing technology. The chapter starts with an exploration of the irrational consumption umbrella, along with a brief presentation of the dual-process systems theory. This is followed by a section outlining emotions, including specific terminology, and their role in consumers' purchasing activities, thereby defining the concept of retail therapy. Here, the origins and consequences of the topic are elucidated, leading to the major consequence of PPR. Lastly, a summary of EST and the current advancements within the industry set the stage for the possible answers to the research question of the thesis project.

2.1 Irrational consumption

2.1.1 From the foundations of rationality theory and the concept of *Homo Oeconomicus*...

In the history of attempts to explain consumer behaviour and its underpinning foundations, the widespread belief assumed that individuals acted according to what they thought to be suitable for themselves (Strack & Deutsch, 2004). Human beings were indeed perceived as “rational animals”, able to interpret and discern the value and benefits of their actions and decisions (Strack & Deutsch, 2004, p. 220).

In his “Theory of Moral Sentiments”, Adam Smith (1759) presented the groundwork of rational consumers and the concept of *Homo Oeconomicus*, which became a prominent archetype of the neoclassical economics movement. Defined by Vriend (1996) as “an agent with given preferences, pursuing his self-interest, seeking to do the best he can give his opportunities” (p. 265), a *Homo Oeconomicus* is a rational decision-maker who seeks to maximize utility and satisfaction (Jung, 2003; Kim, 2003). According to neoclassical economists, this rational attitude enables the *Homo Oeconomicus* to make choices in consistency to a complete set of well-ordered preferences, subject to perfect, and zero-costs acquired information (Blaug, 1992).

Smith's (1759) argument about Homo Oeconomicus and maximization of utility has been settled over a few centuries until the mid-nineteenth century. In this period, theorists started to claim that economics could be treated as a traditional discipline of social science, based on the fundamental assumption that consumers are rational in their consumption behaviours (Lee, 2005).

2.1.2 ...to the acknowledged limitations in human cognitive abilities

Nonetheless, limitations of the original Homo Oeconomicus soon emerged and became further evident with the development of behavioural economics, which highly criticised the failure of the neoclassical model in providing a truthful representation of people's behaviour (Kahneman & Tversky, 1973, 1974; Simon, 1955; Thaler, 2000). By questioning the principle of full rationality, behavioural economists sustained that several deviations exist in human beings, which prevent them from choosing optimally (Simon, 1955). Among others, these include judgments, goals or feelings (Brzezicka & Wisniewski, 2014).

Furthermore, Kahneman and Tversky (1974, 1979) showed that the theories postulated by the neoclassical approach do not mirror the strategies individuals rely on during their decision-making activities. According to the authors, human beings are not entirely rational and self-controlled; rather they are mostly unable to make deliberate choices or accurate calculations. Consumers' decisions indeed result from cognitive processes that are outcomes of the partial or total absence of information (Kahneman & Tversky, 1974, 1979). Besides, individuals are deeply affected by personal thoughts, actions and external factors, which severely shape their decision-making processes (Etzioni, 2011; Simon, 1955, 1957).

At the same time, the assumption of well-ordered preferences received criticism. Indeed, different empirical studies revealed that individuals do not behave with completeness and transitivity, thereby causing their likings to change and be inconsistent over time (Alba & Chattopadhyay, 1986; Davis, 1958; Simonson & Tversky, 1992). A revolution in science of human behaviour emerged from here, raising the need for existing models of rational choices to be redefined (Simon, 1957). Specifically, the fact that people choose and judge under constraints of uncertainty has pushed psychologists to investigate the mechanisms at the base of information processing and decision-making (Strack et al., 2006).

2.1.3 The rise of the dual-process theory: System 1 and System 2 in comparison

The idea that human behaviour is shaped by more than one process has given birth to several dual-process models, which have been applied to a range of economic settings (Brocas & Carrillo, 2014). In particular, the concept underneath any dual-process theory is that the human mind presents both a fast, automatic, and non-conscious thinking as well as a slow, controlled and conscious one (Samson & Voyer, 2012).

In line with extant literature, the first dual-process model dates back to 1977, when Schneider and Shiffrin conducted a series of experiments on the level of attention to study information processing. These emerged in two contrasting systems: automatic versus controlled (Brocas & Carrillo, 2014). Consistently, over the last two decades, many psychologists have acknowledged the existence of two opposite modes of thought with different capacities, referred to as *System 1* and *System 2* (Metcalf & Mischel, 1999; Strack & Deutsch, 2004). System 1 (S1) is characterised by quick and automatic information processing, high-capacity reflective thinking, and draws on experiential associations (Samson & Voyer, 2012). In contrast, System 2 (S2) involves slow and controlled processes of information, low-capacity intuitive thoughts, and draws on associations acquired through cultural or formal learning (Samson & Voyer, 2012).

With respect to consumer behaviour, Strack and Deutsch (2004) and successively Strack et al. (2006) suggested that a decision-making activity results from either a deliberate or an immediate choice. Specifically, the authors developed the Reflective-Impulsive Model (RIM), a dual-system framework based on the idea that consumer behaviour is a blended function of reflective and impulsive processes. In particular, decisions made under the reflective system are based on calculated values and knowledge about facts, while they occur without the individuals' intention in the impulsive one (Strack & Deutsch, 2004).

In conformity with RIM, when engaging in a purchasing activity, the consumers are affected by mechanisms in both the reflective and impulsive systems, ultimately performing either an informed decision influenced by previous assessments and considerations, via S2; or an unplanned choice, via S1 (Samson & Voyer, 2012). A thorough elucidation of the RIM framework is provided in chapter 3.

2.1.4 Bounded rationality and impulse influences

Although the rational choice theory has been severely criticised for providing a valid psychological explanation of consumer behaviour, literature revealed it has served as a normative model against which empirical divergences were formulated and evaluated (Strack et al., 2006). In this regard, the concept of *bounded rationality* is frequently found in papers to account for these discrepancies (Strack et al., 2006). The term was developed by the economic and sociologist H. A. Simon (1957), who argued that people fail to maximize utility by reason of two main factors. In particular, by considering both situational and cognitive limitations, Simon (1957) claimed for independent circumstances on the one hand, such as a complex market in which situations change, and information is incomplete. On the other hand, he took internal influences into account, including impulses and habit-determined behaviours. Both these dynamics prevent individuals from pursuing valued decisions (Simon, 1957).

Applied to the context of consumer behaviour, the principle of bounded rationality implies that people take decisions based on their judged utility (Strack et al., 2006). However, since human cognition is restricted, consumers are unlikely to collect all information, conduct perfect calculations, and therefore take the best option among many alternatives to maximize their satisfaction. Moreover, individuals' decision-making processes are vulnerable to the presence of influential, often undesired, external factors (Cialdini, 1993 in Strack et al., 2006). The fact that impulses might drive consumer behaviour is a further explanation of the empirical differences with the rational choice model (Strack et al., 2006). In fact, the act of buying can generally be a function of an impetuous and immediate influence on the behaviour, rather than the outcome of a thoughtful reflection (Strack et al. 2006).

2.1.5 The role of emotions in consumers' decision-making activities

By denouncing the rigid premises constituting the rationality theory, the fundamentals underlying the Homo Oeconomicus principle ultimately lost their validity (Brzezicka & Wisniewski, 2014; Kim, 2003; Kim & Choi, 2009). In addition, the expansion of behavioural economics disclosed the importance of the psychological background of consumers' choices, acknowledging that emotions constitute powerful drivers in their decision-making activities. For instance, Thaler (2000) suggested that – besides the individuals' reduced information processing and cognitive abilities – emotions act as significant contributors in shaping the way consumers behave.

In recent years, the role of emotions has become even more dominant: many researchers now affirm that an emotional state is the leading driver of many decisions in life, especially in the sphere of consumption (Gilbert, 2006; Keltner & Lerner, 2010 in Lerner et al., 2015). Herein, emotions and how people manage them shape every stage of consumers' decision-making activity (Achar, So, Agrawal, & Duhachek, 2016; Consoli, 2010; Kemp & Kopp, 2011).

2.2 Emotions and consumer behaviour

2.2.1 Defining emotions

Despite the complexity to outline a proper definition, literature generally agrees on describing emotions as multidimensional affective states about an individual's interpretation of his or her internal or external surroundings. Often acute, emotions typically occur in "a relatively short period of time and are related to a particular event, object, or action" (Westerink, van den Broek, Schut, van Herk, & Tuinenbreijer, 2008, p. 150).

Psychological science depicts emotion as the relation between two dimensions: valence and arousal (Salgado & Kingo, 2020). The former entails the degree of pleasantness of an emotional state, generally assessed from negative to positive (Westerink et al., 2008). In contrast, the latter refers to its intensity, i.e., the level of excitation an individual experiences when the emotion unfolds (Salgado & Kingo, 2020). From here, an infinite number of emotions can be differentiated based on their level of valence and arousal (Westerink et al., 2008). In particular, Feidakis, Daradoumis and Caballé (2011) identified 66 different emotions, which can be classified into two categories: primary and secondary. In line with the authors' research, the primary emotions are ten: anger, anticipation, distrust, fear, happiness, joy, love, sadness, surprise, and trust.

As aforementioned, emotions entail psychological arousal to one or more stimuli. These stimuli allow cognitive evaluations – defined as *appraisals* – enabling people to identify a particular emotional state, which may manifest physiologically and in turn shape their decisions (Achar et al., 2016; Consoli, 2010). Elucidation of the different emotion appraisals is needed to provide a further understanding on the "subtle nuances of emotions" (Watson & Spence, 2007, p. 490).

2.2.2 Appraisal dimensions of emotions

Initially disseminated by Lazarus (1966) and contemporaries (Bagozzi, Gopinath, & Nyer, 1999; Elliott, 1997), cognitive appraisal theories have been widely acknowledged to explain how emotions affect decisions and related consumer behaviours (McDuff & Czerwinski, 2018; Watson & Spence, 2007). The belief underlying cognitive appraisal models suggested that emotions are distinguished based on an individual's interpretation of a stimulus, such as an object or event. The resultant appraisal then elicits a specific emotional response, which in turn influences the person's decision-making activity (McDuff & Czerwinski, 2018; Watson & Spence, 2007).

Different yet convergent cognitive appraisal variants have been formulated throughout the years, each proposing a diverse number of dimensions necessary to distinguish between emotional responses (Smith & Ellsworth, 1985; Frijda, 1986; Roseman, 1991 in Watson & Spence, 2007). Since a standard theory has not been recognised by extant literature, the presented thesis project referred to the six orthogonal dimensions found by Smith and Ellsworth (1985). In particular, by conducting a cognitive mapping of emotions, the authors showed that the appraisals of one's circumstances play a significant role in how people experience their emotions along different cognitive dimensions. Namely, these are pleasantness, anticipated effort, certainty, attentional activity, self-other responsibility/control, and situational control (Smith & Ellsworth, 1985). In addition, these six patterns of appraisals are in turn related to different emotional states (e.g., happiness, sadness, anger, etc.), thereby causing distinctive responses and implications on an individual's decision-making process (Lerner & Keltner, 2000).

2.2.3 Integral or incidental emotions?

When examining emotions within the field of consumer behaviour, it is also useful to distinguish between integral and incidental. Firstly, integral emotions arise both at conscious and non-conscious levels from the judgment or choice at hand (Achar et al., 2016; Lerner et al., 2015). These can strongly affect decision-making processes, even in the light of cognitive information suggesting alternative ways to proceed (Loewenstein, 1996 in Lerner et al., 2015). In this context, Achar et al. (2016) classified marketing actions, such as advertising and other promotional efforts, as capable of evoking integral emotions.

Secondly, incidental emotions emerge from subjective personality traits of consumers or unrelated environmental factors and shape decisions that should, from a normative viewpoint, be unconnected to the emotion (Achar et al., 2016; Yates 2007 in Lerner et al., 2015). Psychological researchers defined this process as the *carryover of incidental emotion*, typically occurring in states of unawareness (Loewenstein & Lerner, 2003; Lerner et al., 2015).

Both processes end with an emotional response tendency, which influences the subject's choice on the purchasing act (Achar et al., 2016). However, only incidental emotions were considered for the current research purpose, being the ones associated with an impulse buying behaviour and occurring as a reaction to external, unrelated events (Mick & DeMoss, 1990). In this regard, previous studies showed that an altered emotional state leads people to take impulsive decisions, usually aimed at controlling and regulating emotions (Achar et al., 2016; Gross, Richards, & John, 2006; Pham, Cohen, Pracejus & Hughes, 2001 in López & Ruiz de Maya, 2012).

2.2.4 The regulatory affect mechanism and consequent impulse buying behaviour

Theories on regulatory affect mechanisms posited that people generally tend to regulate a negative emotional state, by seeking a more pleasant situation than the one experienced in that moment (Kemp & Kopp, 2011; Watson & Spence, 2007; Wegener, Petty & Smith, 1995 in López & Ruiz de Maya, 2012). As a result, the term *emotion repair* has become widely acknowledged and involves the effort to recover from undesirable emotions (Gross & John, 1998 in Kemp & Kopp, 2011).

The literature proposed a variety of tactics, through which individuals can restore a positive emotional state, including shopping and buying (Gross, 2014; Parkinson & Totterdell, 1999 in Lee, 2015). In particular, consumers experiencing negative emotions often engage in impulse buying behaviour (Baumeister, 2002; Beatty & Ferrell, 1998) as a temporary strategy to manage those affective states. Initially, early research within the marketing field described impulse buying simply as an unplanned purchasing (Beatty & Ferrell, 1998), i.e., a shopping activity that was not previously considered. However, this definition came with criticism, as it was mostly incomplete (Rook & Gardner, 1993; Rook & Hoch, 1985 in Beatty & Ferrell, 1998).

Impulse buying is indeed unplanned by default – yet it also involves experiencing a prevailing and emotion-driven need to make a purchase (Beatty & Ferrell, 1998). Since this need occurs suddenly and often in an irresistible way, the instinct to buy involves rapid decision-making processes and requires immediate action (Rook & Gardner, 1993; Park & Dhandra, 2017). In line with this outlook, Rook (1987) defined impulse buying as “a sudden, often powerful and persistent urge to buy something immediately” (p. 191).

In addition, Beatty and Ferrell (1998) further extended the explanation, describing it as “a sudden and immediate purchase with no pre-shopping intentions either to buy the specific product category or to fulfil a specific buying task” (p. 170). As pointed out by the authors, the behaviour occurs as a response to an urgency to buy and tends to be spontaneous and with a limited reflectivity (Beatty & Ferrell, 1998). Consistent with this definition, shoppers who buy impulsively do not plan the purchase in advance and instead lack consideration of the implications (Beatty & Ferrell, 1998).

2.2.5 The aim of impulse buying: Restoring positive emotions

As aforementioned, extant studies revealed that emotions are among the main drivers for impulse behaviour (Strack & Deutsch, 2004; Shen & Khalifa, 2012). In particular, Silvera, Lavack and Kropp (2008) identified which psychological states are most strongly associated with it, linking the urge to buy to a negative emotional state. Furthermore, as explained by the authors and thoroughly demonstrated in contemporary research, an impulsive purchase is usually followed by positive reinforcement, thereby serving the purpose of improving unpleasant affective states (Baumeister, 2002; Park & Dhandra, 2017; Silvera et al., 2008). Consumers tend indeed to experience high-arousal emotions such as excitement and gratification when shopping impulsively (Verplanken et al., 2005).

This was further confirmed by Rook and Gardner (1993) and Beatty and Ferrell (1998). They conducted a number of studies revealing that impulse buying produces pleasant emotional reactions, as most individuals felt better after it. Hence, since individuals would rather feel good than bad (Clark & Isen, 1982 in Kemp & Kopp, 2011), people experiencing negative emotions are prone to engage in impulsive shopping to achieve short-term gratification (Gross et al., 2006; Silvera et al., 2008; Vohs & Faber, 2002). In line with these findings, Verplanken et al. (2005) suggested that the leading function of impulse buying is indeed to act as “a self-regulatory mechanism aimed at reducing negative feelings” (p. 430).

In this context, López and Ruiz de Maya (2012) shed light on two types of products, which play a distinctive role in impulsive purchases: *utilitarian* and *hedonic*. In particular, they affirmed that, while utilitarian goods are more instrumental and thus less closely linked with emotion, “hedonic products evoke emotional arousal resulting from sensations derived from the experience of using the product” (p. 703). Due to their connection to sensory appeals, goods of hedonic nature can thus represent means of emotion regulation (López & Ruiz de Maya, 2012). Therefore, it is essential to clarify the distinction between these two categories, since the intention to purchase a hedonic product is especially related to the individuals’ sense of gratification (Woods, 1960 in López & Ruiz de Maya, 2012).

2.2.6 Hedonic consumption

Hirschman and Holbrook (1982) defined hedonic consumption as the “facets of consumer behaviour that relate to the multisensory, fantasy and emotive aspects of one’s experience with products” (p. 92). In addition, the key motivation for the consumption of products of hedonic nature lies in the pursuit of emotional arousal, as they are deemed to trigger a highly positive affective response in consumers (Hirschman & Holbrook, 1982; López & Ruiz de Maya, 2012).

In line with the belief that hedonic goods are perceived as an opportunity to elevate one’s current mood, findings in the literature revealed that individuals in negative emotional states are especially tempted to purchase this type of products (Atalay & Meloy, 2011; Kemp & Kopp, 2011). As a result, impulsive buyers tend to show higher hedonic rather than utilitarian preferences towards their purchase intentions (Verplanken et al., 2005; Silvera et al., 2008; Lopez and Ruiz de Maya, 2012).

Among the negative emotional states, incidental sadness is predominantly thought to lead to impulsive hedonic consumption as an emotion-repair solution (Salerno, Laran, & Janiszewski, 2014). For instance, a study from Kemp and Kopp (2011) thoroughly demonstrated that sad consumers were especially inclined to purchase products of hedonic nature with the purpose of repairing their emotion. For this reason, the current research project focuses on impulse buying behaviour as a consequence of consumers’ incidental sadness.

2.3 Incidental sadness and appraisal of situational control

Studies on incidental emotions suggested that an emotional state tends to carry over from a situation to another, influencing people's behaviour and judgment in unrelated actions (Keltner & Lerner, 2010 in Lerner et al., 2015). As clarified in section 2.2.2, emotions can be categorised according to different appraisal dimensions. Among others, a highly influential event to determine a negative emotional state is the "who or what had control over the stimulus event" (Watson & Spence, 2007, p. 496). Indeed, the control dimension has consistently appeared across literature, and it has been intended as the need of individuals to quickly evaluate their ability to cope with the situation (Scherer, 1982 in Smith & Ellsworth, 1985).

In an emotional context, Smith and Ellsworth (1985) explained that people first distinguish the situation based on whether it was controlled by themselves or someone else. Secondly, control is further assessed on the degree to which the event was caused by external circumstances, i.e., beyond anyone's control (Smith & Ellsworth, 1985). In this regard, the sixth appraisal theme proposed by Smith and Ellsworth (1985) – *situational control* – entails indeed the "extent to which the affective situation is controlled by circumstances (or fate) versus the extent to which it is controlled by any human agent (self or other)" (p. 824). In other words, it refers to the perceived level of control of an individual over a specific situation (Garg & Lerner, 2013).

In conformity with extant research, incidental sadness is intimately characterised by the appraisal of situational control (Lerner & Keltner, 2000). Smith and Ellsworth (1985) state that "the situational control dimension [...] is essential for understanding the unpleasant emotions" (p. 835) and identify sadness to be distinctively high on this appraisal theme. In fact, sadness stood out from all the other emotions analysed by a very high appraisal of situational control. As explained by the authors, people experience sadness as an unpleasant situation which is "controlled by impersonal circumstances and that nothing can be done to set it right" (Smith & Ellsworth, 1985, p. 834). As a result, the amplified sense of lack of control evokes implicit tendencies to change one's circumstances (Lerner et al., 2015). In particular, people pursue strategies to counterbalance their feeling of loss (Raghunathan & Pham, 1999).

Within the sphere of consumer behaviour, incidental sadness and related appraisal of situational control can multifariously influence the way individuals conduct their decision-making activities (Schwarz & Clore, 1983 in Lerner et al., 2015). The following paragraph accounts for a number of examples, which confirm consumers' inclinations to engage in actions aimed at changing their conditions.

2.3.1 Studies on incidental sadness revealing higher impulse buying behaviours

In the field of consumer transactions, sadness has been shown to generate positive appraisals towards new products, leading people to spend more money on the purchase (Lerner, Small & Loewenstein, 2004 in Garg & Lerner, 2013). Moreover, a wide array of research showed the effects of compensatory consumption: in the domain of eating, for example, sad people tend to indulge in tastier, fattier and higher-caloric snacks – sometimes defined as *comfort foods* – rather than healthier alternatives (Tice, Bratslavsky, & Baumeister, 2001).

Vohs and Faber (2002) further added to the existing literature by proposing the divergence between incidental sadness and consumers' self-control. This latter is defined as an individual's ability to "produce desired outcomes in the environment" (Lee, 2015, p. 96); and thus, entails regulating one's behaviour in order to match personal values and social expectations (Luo, Gu, Wang & Zhou, 2018). In this regard, although people try to exert control over a specific situation (Rothbaum, Weisz, & Snyder, 1982 in Kemp & Kopp, 2011), a negative emotional pressure reduces or even demolishes human self-control (Vohs & Faber, 2002). In turn, this resulting decline often triggers uncontrolled consumer behaviour (Luo et al., 2018).

In particular, Baumeister, Heatherton, and Tice (1994) tested the relationship between sadness and breakdown in self-control and discovered that when people are emotionally upset, the goal of feeling better takes precedence over high standard and desirable, long-term outcomes. This in turn leads them to impulsively purchase goods or services with the hope of restoring the positive emotion (Baumeister et al., 1994). Kemp and Kopp (2011) further investigated the topic, concluding that the consumers who were less able to exercise control over their sad emotional state purchased hedonic goods as a mechanism to manage and down-regulate their negative emotion.

The reduction in self-control associated with incidental sadness is thus one of the main origins of impulse buying behaviour (Vohs & Faber, 2002; Luo et al., 2018). When shopping, sad individuals are frequently unable to restrain themselves from an impulsive hedonic consumption (Garg, Wansink, & Inman, 2007).

2.3.2 Consequences of impulse buying behaviour: Benefits or threats?

To the extent that incidental sadness prompts an urgency to spend, and instinct purchases are considered to generate positive feelings (Gardner & Rook, 1988 in Beatty & Ferrell, 1998), impulse buying behaviour can be associated with retail therapy. Described in detail throughout chapter 4, the concept of *retail therapy* implies that consumers attempt to regulate their feelings by consuming or purchasing products from which they derive a positive emotional benefit (Achar et al., 2016). Therefore, retail therapy is considered a tool to restore control over situations and emotions, although only with a short-term effect (Noh & Rabik ul Hasan, 2017).

In some extreme cases, incidental sadness and impulsive consumption might nonetheless create negative, recurring cycles of behaviour (Garg & Lerner, 2013). In this regard, Kemp and Kopp (2011) advised that this type of consumption can have adverse effects if done excessively. In particular, when sad consumers repeatedly engage in shopping activities to achieve short-term gratification, these can produce an increase in negative mood, further perpetuating the behaviour (Leith & Baumeister, 1996 in Garg & Lerner, 2013). Contextually, a body of literature about the consequences of impulse buying behaviour has been developed: among others, several researchers mostly mention compulsive shopping (Baumeister, 2002; Beatty & Ferrell, 1998; Rook, 1987).

Caused by negative events, *compulsive shopping* is an addictive consumption behaviour (Faber & O'Guinn, 1992). Unlike retail therapy, it involves long-term and repetitive purchasing activities (Luo et al., 2018). People suffering from compulsive shopping behaviour – defined by Lee (2015) as *shopaholics* – purchase to an excessive extent only for the pleasure achieved during the buying process, rather than for the gratification obtained from the actually purchased goods (O'Guinn & Faber, 1989; Paquet, 2003 in Lee, 2015). In addition, this behaviour is hard to stop, and it is likely to cause severe psychological, economic, and social consequences to consumers (Luo et al., 2018).

Most scholars agreed that the majority of individuals affected by compulsive shopping behaviour have psychiatric disorders, e.g., anxiety, loneliness, and depression (Müller, Mitchell, & Zwaan, 2015; Schlosser, Black, Repertinger, & Freet, 1994). In this respect, the current thesis project dropped this facet of consumption behaviour, as its fundamentals go beyond the consumer behaviour theories. The focus is thus exclusively given on the impulsive consumption activity, i.e., retail therapy.

2.4 Retail therapy

Retail therapy is an extremely discussed concept among scholars, especially in regard to its causes as well as the consequences involved. By reviewing several representative works on the relation between incidental emotions and impulse buying behaviour, it can be concluded that consumers often conduct shopping activities intending to achieve therapeutic benefits (Atalay & Meloy, 2011; Kemp & Kopp, 2011; López & Ruiz de Maya, 2012; Luomala, 2002).

2.4.1 Retail therapy and reasons why people resort to mood-alleviating consumption

Literature has generally conceived two key reasons behind consumers' engagement in retail therapy: *compensatory consumption* (Woodruffe-Burton, 1998; Yurchisin, Yan, Watchravesringkan, & Chen, 2006) and *mood-alleviating consumption* (Ko, Chun, Song, & Mattila, 2015; Luomala, 2002). On the one hand, retail therapy is used as a means to compensate for perceived psychosocial deficiencies, such as low self-esteem (Lee & Böttger, 2017). In this regard, retail therapy occurs “when an individual feels a need, lack, or desire which they cannot satisfy with a primary fulfilment, so they use purchasing behaviour as an alternative means of fulfilment in its place” (Woodruffe-Burton, 1998, p. 301).

On the other hand, several empirical findings foster the common wisdom that a negative emotional state can lead consumers to engage in retail therapy activities (Atalay & Meloy, 2011; Luomala, 2002; Mick & DeMoss, 1990; Rick et al., 2014). In this case, retail therapy acts as a mood-regulatory device. In other words, retail therapy is deemed effective in helping shoppers regulate their emotions and especially dispelling their negative moods (Lee, 2015). Indeed, sad individuals tend to purchase and consume treats to lighten their spirit (Ko et al., 2015).

This function of retail therapy – appointed by Kemp and Kopp (2011) as *emotion regulation consumption* (ERC) – entails the act of consuming or purchasing a good with the aim of “alleviating, repairing, or managing an emotion in the short-term” (Kemp & Kopp, 2011, p. 1). When the goal of ERC and, in general, retail therapy is accomplished, the emotions generated by the purchase enable consumers to adjust their affective states (Wegener et al., 1995 in López & Ruiz de Maya, 2012).

By eliciting a positive emotional response, the objects of consumption become the core of the decision-making process encountered by consumers, especially when sad (Samson & Voyer, 2012). For instance, Mick and DeMoss (1990) found that, when experiencing incidental sadness, people often reward themselves with self-gifts as a means of elevating a negative mood. In addition, Weinstein, Mezig, Mizrachi and Lejoyeux (2015) exposed that, when feeling upset, consumers were more prone to shop, whereas when in a good temper, their shopping behaviour notably decreased.

As aforementioned, incidental sadness is strongly correlated with the appraisal theme of situational control, which implies a lack of control over one’s external environment (Smith & Ellsworth, 1985). Indeed, sad people are prone to believe that their own actions do not govern their condition, rather it is a consequence of situational forces, which do not depend on anyone (Rick et al., 2014). According to a study conducted by Rick et al. (2014), shopping has the ability to restore a sense of control over one’s surroundings and, consequently, reduce residual sadness. This is commonly achieved through the mere purchase of products (Lee & Böttger, 2017). Specifically, consumers can raise their perceived situational control through actions common of the shopping experience, e.g., discovering the latest brand trends or purchasing desired products without constraints (Lee, 2015). These actions consequently involve a regain of positive emotions, in line with the mood-alleviating role of retail therapy (Atalay & Meloy, 2011).

In order to understand the process of restoring control, it is helpful to consider the conceptual framework of retail therapy developed by Lee and Böttger (2017), which found its basis on the human motivation theory suggested by McGuire in 1974. In particular, the model identified the macro-reasons that drive people towards therapeutic purchasing activities, along with a deep understanding of the sources of utility deriving from the buying process (Lee & Böttger, 2017).

In their framework, Lee and Böttger (2017) took into account three key dimensions, i.e., *cognitive versus affective, preservation versus growth, purchase versus non-purchase* (Lee & Böttger, 2017). These three dichotomies subsequently developed into four major motivations, which explain the reasons why consumers tend to engage in retail therapy. In turn, these branched into eight categories of benefits that people encounter during the impulsive consumption activity (Figure 1).

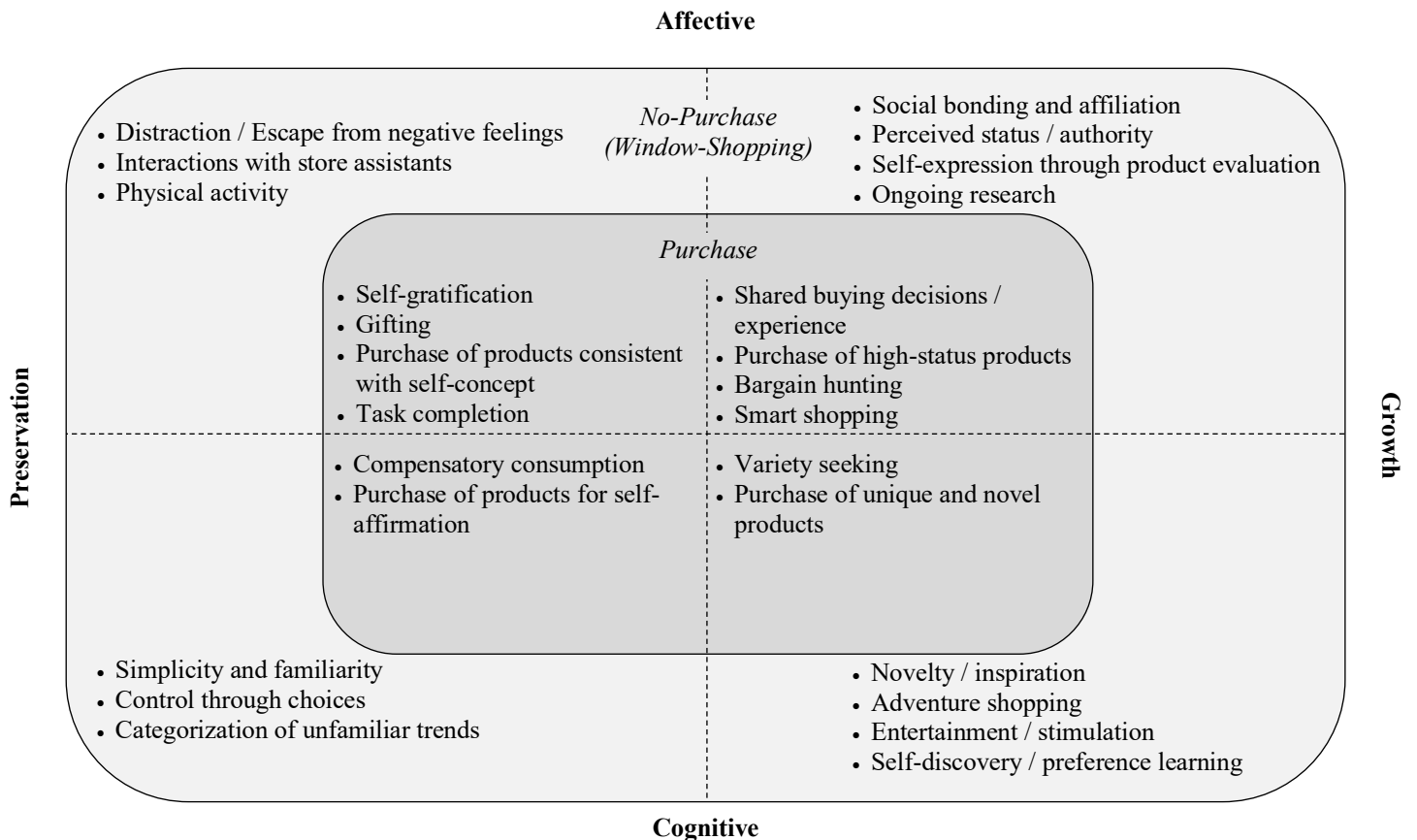


Figure 1. Conceptual Framework for Retail Therapy by Lee and Böttger (2017, p. 10)

Among the four key motives, the so-called *affective-preservation* is considered the foundation for the current thesis project. This refers to the affective and preservation needs that incite consumers to engage in retail therapy activities. Affective motives relate to the human necessity to achieve specific emotional goals, generally entailing positive emotional states (Lee & Böttger, 2017). Whilst preservation motives focus on the inner need of consumers to maintain and prolong the positive equilibrium previously reached (Lee & Böttger, 2017).

In other words, the affective-preservation sphere covers the idea that the reasons behind retail therapy are of hedonic nature and specifically aim to the generation of positive reinforcement and mood elevation (Lee & Böttger, 2017). The ultimate benefit for consumers is to repair the negative emotion, thereby choosing “to indulge in temporarily gratifying consumption to improve their mood” (Lee & Böttger, 2017, p. 13).

2.4.2 *What’s after retail therapy?*

The key advantage underpinning a retail therapy activity lies in the regain of positive emotions. As aforementioned, the ability to make a choice tends to improve one’s sense of situational control (Inesi, Botti, Dubois, Rucker, & Galinsky, 2011). Therefore, since shopping encompasses a large set of decisions – choosing whether and what to buy, which colour or brand, and so on – retail therapy can re-establish control over a situation, thereby enhancing an individual’s emotional state (Rick et al., 2014).

However, it is vital to stress out that retail therapy has merely a short-term positive impact. This is due to the fact that it occurs temporarily during a specific period of liminality, characterised by an emotional state of sadness and related appraisal of lost situational control (Yurchisin et al., 2006). Consequently, retail therapy helps people only alleviate their non-permanent negative emotions (Noh & Rabik ul Hasan, 2017). Yet, consumers are deemed to prefer immediate rewards over those that come in the distant future, especially when experiencing incidental sadness (Seeman & Schwarz, 1974 in Lee & Böttger, 2017). For this reason, they indulge anyway in a temporary gratifying consumption to improve their current situation (Kemp & Kopp, 2011; Lee & Böttger, 2017).

In this context, the restored positive emotional state can lead to two scenarios. On the one side, when retail therapy is successful, consumers immediately experience positive emotional reinforcement; while embracing and maintaining a neutral emotional state in the long run (Rick et al., 2014). On the other side, after the shopping activity, consumers may regret their purchase – a feeling defined by literature as *post-purchase regret* (PPR) (Atalay & Meloy, 2011; Lee, 2015). While incurring in retail therapy, consumers neither evaluate their actions nor consider their consequences; rather they keep engaging in such impulsive hedonic consumption (Rohatyn, 1990 in Clarke & Mortimer, 2013). This behaviour implies that any purchase could bring disappointments, worries, post-purchase regrets and unwanted consumption (Clarke & Mortimer, 2013).

2.4.3 The inner harmful effects of retail therapy

As outlined in chapter 2.3.2, retail therapy is strictly associated with an impulse buying behaviour, as incidental sadness causes the urge to spend, in turn generating a short-term positive emotional response. In this regard, extensive literature revealed the existence of a strong relationship between impulse buying and PPR (Hoch & Loewenstein, 1991; Parsad, Prashar, Vijay, & Sahay, 2019; Saleh, 2012). As a matter of fact, consumers who aim at feeling better and incur in impulsive shopping often report a strong sense of guilt (Koles, Wells, & Tadajewski, 2018, Lim & Yazdanifard, 2015).

The cause of PPR can be associated with the irrational nature of impulse buying behaviour (Saleh, 2012). Indeed, the immediate and impetuous desire to pursue instant gratification, which is typical of retail therapy, is what contributes most to experiencing regret (Parsad, Prashar, Vijay, & Sahay, 2019). In other words, the instinctivity of the decision-making, and related impulsive purchasing activity, trigger a later sense of dissatisfaction in consumers, common of PPR (Tsiros & Mittal, 2000; Saleh, 2012).

In conclusion, retail therapy is not always effective, as it often involves situations, which may eventually lead consumers to experience, once again, a negative emotional state (Lee, 2015). The phenomenon of PPR is at the core of the present research and thereafter discussed, together with an exhaustive analysis of its causes. Specifically, the ensuing paragraphs are dedicated to understanding the main implications of PPR, both from a consumers and brands' viewpoint.

2.5 Post-purchase regret

Zeelenberg and Pieters (2006) defined regret as a “backward-looking emotion signalling an unfavourable evaluation of a decision” (p. 418). In particular, its causes mainly relate to (1) the desire to have chosen differently and (2) the belief that the original decision was wrong (Sugden, 1985). As a matter of fact, regret has traditionally been known to be a painful sensation that arises as a result of comparing “what is” with “what might have been” (Clarke & Mortimer, 2013, p. 474). In addition, according to Sugden (1985), regret includes elements of self-recrimination and self-blame. As explained by the author, when individuals realise that their choice involved an error of judgment, they tend to feel responsible for taking a wrong decision in the very first place.

To experience regret, individuals must cognitively process and compare one option with another one (Lee & Cotte, 2009). After shopping activities, consumers tend to judge their purchasing decision in relation to whether the product satisfied their predicted expectations, i.e., how they felt about the product before buying it (Lee & Cotte, 2009). When a significant difference exists between expectation and perception, consumers might feel unsatisfied and, in turn, regret their purchase (Bui et al., 2011). Therefore, PPR may occur due to both the choice of a product rather than another one and the belief that unnecessary spending was made (Çelik, Eru, & Cop, 2019).

With the aim of analysing the crucial elements involved in the experience of PPR, Lee and Cotte (2009) proposed a multidimensional conceptual framework that encompasses two main dimensions of regret: outcome and process (Figure 2). In line with this, it is essential to shedding light on the concepts comprised in the Decision Justification theory developed by Connolly and Zeelenberg (2002). Specifically, this implies that people can experience regret due to two main reasons: the evaluation of the outcome and the evaluation of the process (Connolly & Zeelenberg, 2002).

An *outcome regret* entails a comparison between what was purchased and what could have been purchased if the decision was different (Zeelenberg & Pieters, 2006 in Lee & Cotte, 2009). It thus occurs when one's result is confronted with an outcome that could have been better if the individual had chosen differently (Bell, 1982 in Tsiros & Mittal 2000). Yet – besides the outcome, the quality of a decision-making activity can be questioned, too: essentially, when people perceive their choice to be inferior while comparing it to a better one, they encounter a *process regret* (Lee & Cotte, 2009).

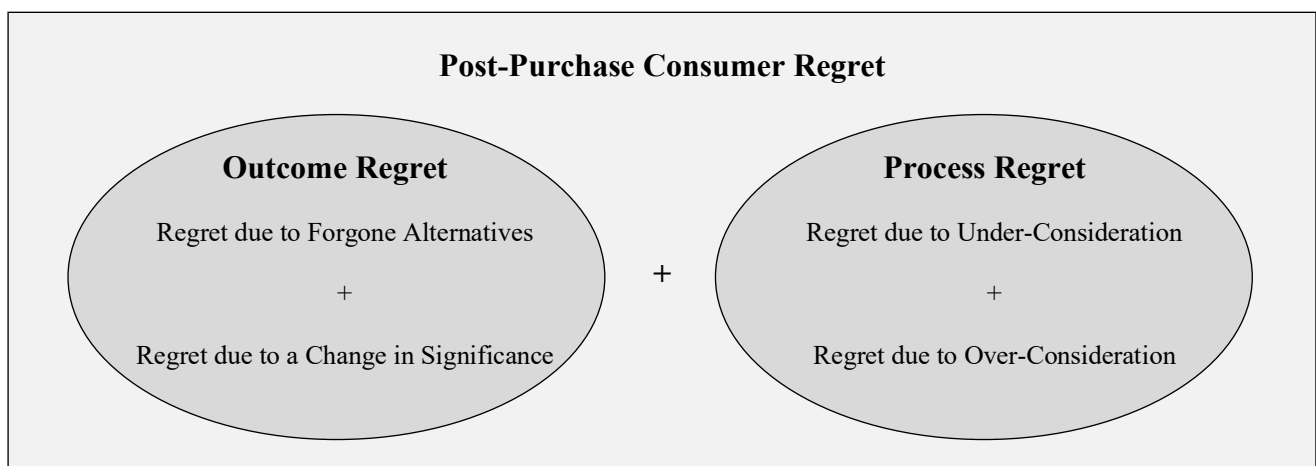


Figure 2. Dimensions of Post-Purchase Regret by Lee and Cotte (2009, p. 457)

According to Lee and Cotte (2009) conceptual model, the aforementioned categories of regrets contain two sub-dimensions each, thereby establishing four types of PPR, as displayed in Figure 2. In this regard, the authors claimed that people could both experience all dimensions of PPR – on different levels and at a given time – and only one dimension (Lee & Cotte, 2009).

Firstly, outcome regret includes *regret due to foregone alternatives* and *regret due to a change in significance*. On the one hand, the former is the most common type of PPR, and it refers to the situation in which individuals feel bad about their choice “in favour of another alternative” (Lee & Cotte, 2009, p. 457). Essentially, this happens when people perceive that the alternatives would have delivered a better outcome, regardless of the knowledge about the other options. Thus, if consumers believe their chosen alternative brought lower benefits than the forgone ones, they are likely to regret their purchase (Çelik et al., 2019). On the other hand, regret due to a change in significance is caused by a consumption gap between expectation and perception of the purchased product. In other words, the individual perceives a “diminished product utility from the time of the purchase to a certain point in time after the purchase” (Lee & Cotte, 2009, p. 458), thereby experiencing a situation of regret.

In addition to the outcome dimension, PPR may also result from the quality of the decision-making process (Connolly & Zeelenberg, 2002). In particular, process regret entails two components: *regret due to under-consideration* and *regret due to over-consideration*. The former occurs when individuals feel guilty about the fast process undertook to reach a decision; and can be due to (1) scarce information collected and (2) little amount of time spent on that decision (Lee & Cotte, 2009). In contrast, the latter refers to the regret consumers experience when they perceive that “they have put too much time and effort into the buying process” (Lee & Cotte, 2009, p. 459).

2.5.1 Consequences of PPR: The consumer's perspective

When consumers experience PPR due to an impulse buying behaviour aimed at mood regulation, there are various drawbacks to contemplate. Particularly, these can be categorised under two main perspectives: emotional and behavioural. For what concerns the emotional side, retail therapy should, in an ideal scenario, result in the re-establishment of situational control and regain a pleasant emotional state (Lee, 2015).

However, PPR arising after this type of consumption causes consequences, which are the opposite of beneficial. Indeed, the resultant sense of regret arising after the purchase might once again generate a negative emotion (Lisjak et al., 2015), ironically disrupting the very first goal of retail therapy – to make people feel better.

As for the behavioural side, two main consequences occur when consumers experience PPR. Firstly, according to M'Barek and Gharbi (2012), regret may impact repurchase intentions. In particular, the authors studied the field of regret arising after a purchasing activity, confirming that PPR may lead consumers to opt for alternative products or brand options (M'Barek & Gharbi, 2012). Secondly, PPR calls for the concept of *inertia* – referred to as the moment when individuals are unable to react to an unpleasant situation (M'Barek & Gharbi, 2012). Consequently, regret leaves consumers at the mercy of their negative emotions (M'Barek & Gharbi, 2012).

2.5.2 Consequences of PPR: The marketer's perspective

Concurrently, PPR is an unfavourable condition for marketers, whose consumers purchased their brands and products and felt dissatisfied with them (Rajagopal, Mahajan, Sharma, & Udas, 2019). In particular, prior research has shown that regret has a direct and negative influence on customers' satisfaction levels and repurchase intents (Tsiros & Mittal, 2000). Consequently, coping strategies such as brand switching behaviour and bad word of mouth (WOM) are obvious yet harmful consequences of this phenomenon (Bui et al., 2011). Furthermore, an enormous, related cost for companies consists in the return of purchased items and associated refund requests. Indeed, consumers often try to balance their disappointment by returning the purchased product and asking for reimbursement, with the ultimate aim of dispelling the negative emotional state caused by PPR (M'Bareck & Gharbi, 2012).

Considering the undesirable implication for brands, companies need to find a way to prevent their customers from encountering PPR. This would indeed cause marketers and organisations in general to diminish the level of customers' loyalty (Bui et al., 2011). At the same time, PPR would pre-empt them from building a long-lasting relationship with the consumers who experienced regret and thus associated a negative experience with them (Bui et al., 2011).

2.5.3 How to solve post-purchase regret?

Marketers constantly look for ways to ameliorate the purchasing experience of their customers. This thesis project has provided a great extent of literature review, which identified PPR as a major negative issue of consumers' purchasing activities. In order to find a solution to this overarching problem, it is first appropriate to address the primal causes that underpin it. In particular, chapter 2.4.2 defined retail therapy to be an important antecedent of PPR. At the base of this impulsive consumption, incidental sadness and consequent appraisal of situational control were intended as major triggering factors of PPR (ref. chapter 2.3).

Researchers have examined a range of strategies to reduce the harmful effects of negative emotions on consumer behaviour. In general, these either try to diminish the emotional response level or separate the decision process from the emotion (Lerner et al., 2015). As for the former group, the tactic of *cognitive reappraisal* has sometimes been used, especially in regard to down-regulating negative states, which lead consumers towards impulse buying behaviour (Gross, 2002 in Lerner et al., 2015; Kemp & Kopp, 2011). In particular, cognitive reappraisal involves "actively seeking alternate interpretations of the meaning of the event" (Kemp & Kopp, 2011, p. 4). In other words, it requires individuals to reconsider the logic of the stimuli that caused a particular emotional response (Lerner et al., 2015). As explained by Lerner et al. (2015), the reappraisal would in turn not just diminish the negative emotional states caused by a particular event but also alleviate the physical and psychological responses to it (Jamieson, Nock & Mendes, 2012 in Lerner et al., 2015).

Alternatively, among the strategies seeking to isolate the decision process from the emotion, Lerner et al. (2015) suggested making people "cognitively aware of their decision-making process" (p. 813) to disable their emotion-related appraisals and the consequent emotional carryover. This solution was labelled as *cognitive-awareness hypothesis* by Han, Lerner and Keltner (2007). Nevertheless, these strategies have been proven to be "more the exception than the rule" (Lerner et al., 2015, p. 813). Indeed, to initiate the cognitive reappraisal process, decision-makers shall recognise that "the interpretation of an emotional experience versus the experience itself is most crucial" (Kemp & Kopp, 2011, p. 6). This implies increasing the awareness of the reasons why they engaged in retail therapy, which is the very same demand for the approach of cognitive-awareness hypothesis.

However, prior research showed that people are often unaware of their negative emotion during their shopping activities (Cohen et al., 2008). Indeed, consumers suffering from incidental sadness and related loss of situational control may not be aware of (1) the sources of the negative feeling and (2) the lack of control and desire to fill it (Lee & Böttger, 2017). Moreover, other factors can further increase the difficulty to raise their cognitive awareness. For instance, customers are usually not motivated enough to judge their decision-making activity in a proactive and self-critical way (Lerner et al., 2015). In addition, even when motivated, it is difficult for them to become thoroughly aware of their decision-making processes (Wilson & Brekke, 1994 in Lerner et al., 2015).

As denoted by extant literature, emotion-sensing technology (EST) has lately been acknowledged to contribute to individuals' ability to raise their level of emotional awareness (McDuff & Czerwinski, 2018; McDuff, Rowan, Choudhury, Wolk, van Pham, & Czerwinski, 2019). Both non-verbal and verbal signals detected by EST, such as facial expressions, tone of voice, or physiological responses, contain some of the richest sources of affective information about a person, thereby becoming important indicators of the human emotional states (McDuff & Czerwinski, 2018).

2.6 Emotion-sensing technology

As emphasised throughout section 2.2, emotions play a substantial role in people's daily lives as they influence several processes: among others, consumers' decision-making activities (Loewenstein & Lerner, 2003). However, within the context of impulse consumer behaviour, questions about capturing emotions are still open due to the human inability to grasp information about their affective states. In this respect, the next paragraph introduces the field of emotion-sensing technology (EST).

2.6.1 The emerging field of emotion recognition

The late growth in the use of smart technologies, and related innovation development in the field of deep machine learning, have raised the interest of organizations to research on the interactions between humans and computers; especially in the emotional and psychological arenas (Dzedzickis, Kaklauskas, & Bučinskas, 2020; Sujata, Madhavi, & Vishal, 2018). In particular, human-computer interactions are abundant with information on emotions that has not been considered by traditional computer systems (McDuff et al., 2019). For this reason, the field of the Internet of Things (IoT) is making enormous advancement in the area of human emotion recognition (Dzedzickis et al., 2020).

Within this context, emotion-sensing technology (EST) has attracted not only the interest of practitioners but also of firms. Indeed, since customers' needs are key issues for businesses, emotion detection could lead to deeper insights about consumer perceptions and related behaviours (Deshmukh & Jagtap, 2017). The reasons behind such an increasing number of studies on the topic lie in the advantages that companies would derive from the detection of human emotional states (Dzedzickis et al., 2020). As previous research has demonstrated, consumers' emotional association towards brands is among the main factor influencing their purchasing decisions (Sujata et al., 2018). By better understanding customers, companies would improve their marketing efforts, thereby raising the chances to improve their business models and increase market shares (Deshmukh & Jagtap, 2017).

At the same time, consumers would also benefit from emotion detection. In their daily routine, individuals often experience negative emotions, which may cause irrational shopping choices due to a decreased level of attention (Taj-Eldin, Ryan, O' Flynn, & Galvin, 2018). Therefore, the use of EST would guide consumers towards better purchasing decisions (Wang, Ho, & Cambria, 2020).

Hence, the innovation concerning the interaction between human emotions and computers is a new frontier, which has heightened the interest of multiple industries. In addition, the recent widespread adoption of electronic devices, such as smart-watches and bracelets, is further advancing the field of EST. These tools do indeed represent an excellent opportunity, as they would facilitate an individual's emotions-monitoring in real-time (Taj-Eldin et al., 2018).

2.6.2 Measurement methods for emotion recognition

Since emotions play a significant role in the lives of human beings, tracking them comes with a number of benefits. However, sensing people's emotional states and how they alter is an integral part of the development of such technology (McDuff & Czerwinski, 2018). Specifically, since emotional changes entail both brain processes and body reactions (Kosonogov, De Zorzi, Honoré, Martínez-Velázquez, Nandrino, Martinez-Selva, & Sequeira, 2017), affective behaviours can be understood automatically by combining different signals (McDuff & Czerwinski, 2018). Thanks to the growing interest in EST, some electronic devices are indeed currently equipped with tools, which can perceive non-verbal signals and, in turn, detect human emotions (Calvo, D'Mello, Gratch, & Kappas, 2015 in McDuff et al., 2019).

However, uncertainty still exists around commonly acknowledged emotion recognition methods (Dzedzickis et al., 2020). In this regard, literature has broadly divided them into two main groups, based on the techniques used: self-report or machine-assessment. While the former is characterised by an emotion self-assessment obtained through surveys or questionnaires, the latter involves the measurements of various human body parameters or electric impulses in the nervous system and the analysis of their change (Dzedzickis et al., 2020).

In particular, the most popular machine-assessment techniques are electroencephalography (EEG), blood pressure, Galvanic skin response (GSR), heart rate (HR), eye activity, and motion analysis (Consoli, 2010). These are further categorised into a wide selection of sensors, both electrical and non-electrical (Dzedzickis et al., 2020). Figure 3 illustrates the extant measurement methods for emotion recognition as classified by Dzedzickis et al. (2020).

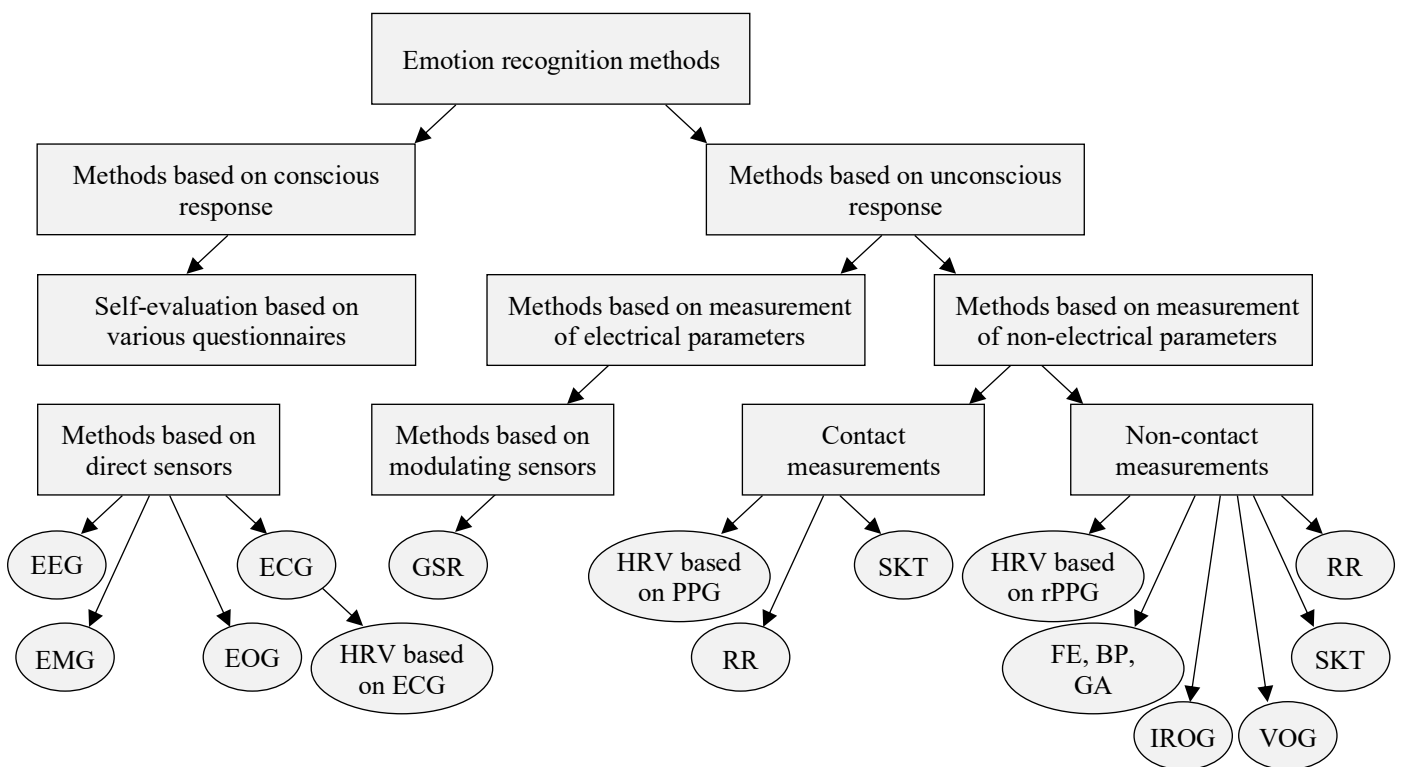


Figure 3. Classification of Measurement Methods for Emotions Recognition by Dzedzickis et al. (2020, p. 29)

Among the different machine-assessment instruments aimed to detect human emotions, automated emotion recognition methods have been developed, which analyse the behavioural response, such as facial or body signals (Ayata, Aslan, & Kamasak, 2016; Kosonogov et al., 2017). In this regard, Consoli (2010) sustained that facial and textual expressions are frequently used in the field of EST. The former, widely applied in both human psychology and neuroscience fields, can be captured through facial features and movements, whereas the latter focuses on detecting textual information (Consoli, 2010). However, since people tend to hide their feelings, methods based on the measurement of facial and textual expressions entail drawbacks, which could lead to a misrepresentation of the emotion (Ayata et al., 2016).

While people are able to control both their facial movement and verbal tone, they do not own the same power over physiological responses (Kosonogov et al., 2017; McDuff & Czerwinski, 2018). Specifically, physiology plays an essential role in recognising an emotional response (McDuff & Czerwinski, 2018), as it consists of the beyond-human control reactions of the autonomic nervous system (ANS) activity (Dzedzickis et al., 2020). Therefore, physiological signals have proven to be reliable measures in the identification of individuals' emotional changes (Ayata et al., 2016). The main idea behind the functioning of the physiological measurement activity is that emotions modulate the ANS output, meaning that the higher an emotion's intensity, the greater the ANS activation (Kosonogov et al., 2017). This alters the physiological state of the individual (Westerink et al., 2008), impacting numerous organs of the human body (McDuff & Czerwinski, 2018).

In contrast to the behavioural response detected through facial and textual emotion recognition, physiological signals can hardly be voluntarily controlled (Kosonogov et al., 2017). Indeed, the main advantage of using these methods lies in the fact that such alterations are regulated by the ANS and thus outside people's conscious control (Scerbo, Freeman, Mikulka, Parasuraman, & Di Nocero, 2001 in Westerink et al., 2008). Furthermore, physiological features are easy to monitor with the help of computer systems (Kosonogov et al., 2017). On this note, emotional responses can be detected through the use of several autonomic techniques. Among others, cardiopulmonary parameters (e.g., heart and respiration rates); brain activity, such as EEG; or skin conductance measures, i.e., GSR (Kosonogov et al., 2017; McDuff & Czerwinski, 2018; Westerink et al., 2008).

3. Theory Development

The following chapter outlines the thesis project hypotheses as derived from extant literature review and the application of the reflective-impulsive model (RIM) (Strack & Deutsch, 2004). The first paragraph introduces the framework developed by the authors, which sets the theoretical perspective of the study. Specifically, the focus is given on three factors intrinsic to the impulse buying behaviour and relevant to the present case: impulsive system, lack of awareness, and negative emotional state (i.e., sadness). Secondly, the hypotheses and a visual depiction of the conceptual model are proposed.

Impulse buying and associated retail therapy have acquired particular relevance to marketing practitioners, as had the harmful effects of its subsequent sense of post-purchase regret (PPR). Nonetheless, section 2.5.3 defended that research into practical solutions to PPR remains limited, as they all account for the individuals' own ability to become consciously aware of their emotions during the impulse buying behaviour (Gross, 2002 in Lerner et al., 2015; Kemp & Kopp, 2011).

Furthermore, most previous research on consumer behaviour approached the topic using traditional attitude-behaviour models, such as the theories of reasoned action and planned behaviour. These principles interpreted buying behaviour and shopping activities as rational processes driven by well-formed intentions, thereby shedding some light on the impact of emotions on rational consumption (Shen & Khalifa, 2012; Silvera et al., 2008). However, they were not efficacious in providing real insights about the spontaneity of the impulse buying behaviour occurring in response to incidental sadness and associated retail therapy. Indeed, such a phenomenon arises, by definition, without prior intention (Rook & Fisher, 1995 in Shen & Khalifa, 2012).

Since impulse buying is inconsistent with rational frameworks (Shen & Khalifa, 2012; Silvera et al., 2008), the reflective-impulsive model (RIM) of consumer behaviour proposed by Strack and Deutsch (2004) laid the foundation of the thesis project. In particular, the RIM theory acted as the main groundwork for the hypotheses development and subsequent proposed conceptual model in regard to diminishing post-purchase regret.

3.1 Reflective-Impulsive model

The reflective-impulsive model (RIM) developed by Strack and Deutsch (2004) explains the association between emotional reactions triggered by objects and the subsequent behavioural response as a relation of two competing forces: impulse and reflection (Figure 4). In the context of consumer behaviour, Strack et al. (2006) subsequently conceptualised the impulsive system as an apparatus where “information is processed automatically through a fast and parallel spread of activation along the associative links between contents” (p. 208). Conversely, the reflective system is intended to operate slowly and perform processes of rule-based reasoning and symbol manipulation (Strack et al., 2006).

Regarding the act of buying, the two systems use different approaches of information processing to elicit a behavioural schema, i.e., behavioural response (Strack & Deutsch, 2004). In particular, in the reflective system, behaviour is obtained as a consequence of a decision process “based on the evaluation of a future state and an assessment of the likelihood with which the state will be reached through this behaviour” (Strack et al., 2006, p. 209). In other words, the reflective system weighs and considers both value and probability of potential consequences for one specific behavioural option. Then, when the decision is taken, a mechanism of intending – seen as a regulatory function that plans and puts intention into action – activates specific behavioural schemata (Strack & Deutsch, 2004).

On the contrary, the impulsive system triggers a behaviour through the mere automatic association of a perceptual input with knowledge acquired over time, defined in cognitive psychology with the term of *spreading activation* (Strack & Deutsch, 2004; Strack et al., 2006). In the impulsive system, the basic origin of behaviour is thus the perception of a stimulus and its instant representations. In contrast, in the rule-based and slowly operating reflective system, the behaviour is the outcome of a reasoning about both viability and desirability of a given action, in turn resulting into a decision (Bandura, 1977 in Strack et al., 2006; Samson & Voyer, 2012). In particular, if the behaviour is considered feasible and its results are assessed as positive, the behavioural schema is activated (Strack et al., 2006).

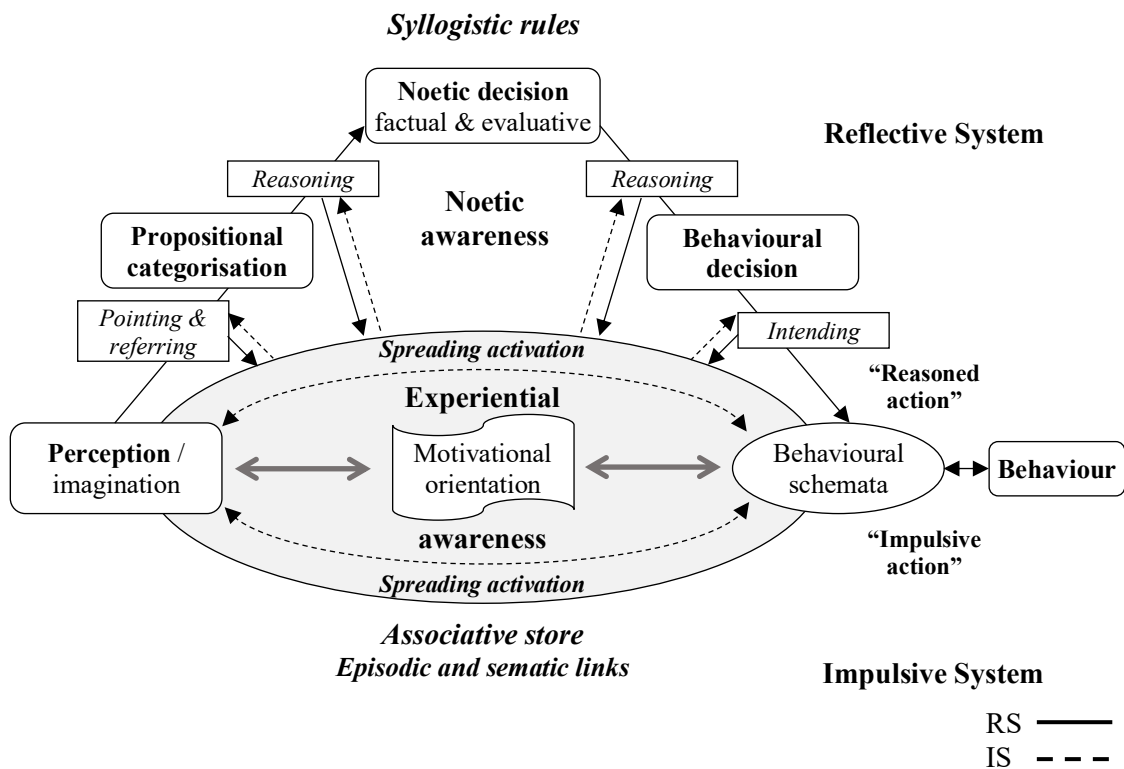


Figure 4. Reflective-Impulsive Model by Strack and Deutsch (2004, p. 239)

Contrary to other types of buying behaviours, Strack et al. (2006) emphasised that the RIM does not discern a specific behaviour to solely be either impulsive or reflective. Instead, they accounted for a mutual contribution of both reflective and impulsive mechanisms in almost all purchasing activities (Strack et al., 2006). Nonetheless, the weight of one system over the other relates to the consumers' personal conditions as well as contextual circumstances under which he or she makes the purchase. Specifically, when consumers are determined to engage in in-depth information processing, and the external setting enables them to spend the time and cognitive capacity needed, their buying behaviour is likely impacted by the reflective system (Strack et al., 2006).

Yet, this requires consumers to have high cognitive abilities and not to get distracted during their decision-making processes (Ariely & Zakay, 2001 in Strack et al., 2006). Indeed, Strack and Deutsch (2004) pinpointed that the operations of the reflective system require much greater availability of awareness since they are more easily disturbed than those of the impulsive system. The role of awareness thus plays distinctly depending on which system is primarily activated.

In this regard, processes in the reflective system are conducted in a noetic awareness state (Strack & Deutsch, 2004). Defined by Metcalfe and Son (2012) as being aware of objects and events – a *noetic awareness* allows consumers to generate clear and well-defined judgments and decisions (Lieberman, Gaunt, Gilbert, & Trope, 2002 in Strack & Deutsch, 2004). Consequently, the activation of the reflective mechanism is subject to a high number of cognitive resources (Samson & Voyer, 2012). However, unfavourable conditions, such as distraction and extremely high or low levels of arousal, can hinder its correct operation (Strack & Deutsch, 2004; Strack et al., 2006).

Conversely, the impulsive system requires little cognitive capacity and activates behavioural schemata also under unfavourable circumstances (Strack & Deutsch, 2004). Specifically, its operations are usually characterised by an *experiential awareness* state. This is identified by Strack and Deutsch (2004) as when individuals experience both affective and nonaffective feelings without necessarily knowing their meaning or origin. For this reason, the impulsive mechanism is primarily conceptualised as experiential, as all senses are generated quickly and automatically, without logical or deductive thinking processes (Strack & Deutsch, 2004).

The state of consciousness that involves awareness and attention to the self, others, and the outside environment substantially supports decision-making (Brown & Ryan, 2003 in Park & Dhandra, 2017). In this context, Strack et al. (2006) sustained that impulse buying behaviour entails “the predominance of impulsive influences that prevent consumers from engaging in deliberative assessments of utility” (p. 207). Consequently, this inhibits the reflective system (S2).

By drawing upon the RIM model (Strack & Deutsch, 2004), Shen and Khalifa (2012) explored the role of cognition in online impulse buying and suggested that the resulting consumption behaviour was more impulsive than reflective. In particular, the authors sustained that during impulsive purchases, consumer behaviour is characterised by the absence of “deliberate consideration of all available information and choice alternatives” (2012, p. 396). In addition, Lim and Yazdanifard (2015) further analysed the sphere of impulsive consumption. Specifically, they described it as a behaviour in which consumers do not reflect upon the search of product information and evaluate neither the alternatives nor the consequences of making the purchase (Lim & Yazdanifard, 2015).

Finally, other studies within the same field sustained that the consumers are not only prone to be impetuous and unreflective during impulsive purchasing activities, but emotional as well (Chen, 2011 in Lim & Yazdanifard, 2015). In this regard, one of the central premises advocated in the RIM theory (Strack & Deutsch, 2004) is the role of emotions and their potential conflict with cognitive control (Vohs & Faber, 2004; Hoch & Loewenstein, 1991). When buying impulsively, consumers are indeed characterised by high arousal, little cognition of the decision-making process, and an automatic behaviour triggered by a specific stimulus or situation (Weinberg & Gottwald, 1982; Shen & Khalifa, 2012). This is also in line with Youn and Faber (2000), who accounted for impulsive purchasing as a behaviour of individuals lacking control and experiencing a negative emotional state.

Applied to the context of impulse buying behaviour, the RIM theory (Strack & Deutsch, 2004) actually contains three propositions: impulse buying is distinguished by the overarching presence of S1; the impulsive system is characterised by a lack of awareness to the self and to the situational context; and a negative emotional state further raise the impulse buying behaviour. By following the same line of thought, the current research project conceptualises impulse buying behaviour as the result of the interaction between impulsive system, absence of awareness, and incidental sadness.

In particular, to the extent that the primary function of impulsive consumption (or retail therapy) is to escape negative feelings, the presence of a negative emotional state is associated with an impulse buying urge. Therefore, the study expects that sad people – yet cognitively unaware of their current state – are prone to experience an impulse buying tendency and subsequently engage in the purchasing activity. Furthermore, previous research has indicated that impulsive consumption often leads to PPR (Saleh, 2012). Thus, it is fair to conclude that sad people, who buy impulsively and engage in retail therapy, are likely to experience PPR.

3.2 Hypotheses development

By taking the discussion above into the current study, it is argued that the factor “awareness” is a driving cause of impulsive consumption, which has an indirect influence on PPR. Consequently, a rise in consumer awareness is accounted as a plausible solution to raise the cognitive abilities necessary to activate the reflective system (S2) and thereby diminish PPR.

As thoroughly explained in the course of the paper, the literature pinpointed that individuals are hardly able to become fully cognitively aware by themselves, especially when experiencing sadness (Cohen et al., 2008; Lee & Böttger, 2017; Lerner et al., 2015). Thus, the study accounts for the usage of external aided tools – in particular, emotion-sensing technology (EST) has recently raised interest in practitioners, thanks to the extensive affective information it provides about a person’s emotional state (McDuff & Czerwinski, 2018).

Given the correlation between cognitive states, arousal, and emotion detection, skin conductance measurements have become an important marker among EST (Braithwaite, Watson, Jones, & Rowe, 2015). Indeed, these are widely used as sensitive indexes of emotional responses, including the ones which are implicit and occur without conscious awareness (Braithwaite et al., 2015). In relation to this research topic, the use of EST, specifically skin conductance tools, would thus help sad consumers be conscious about their altered emotional state by making them more reflective when compelled to engage in impulsive consumption (i.e., retail therapy).

In line with the discussion above, the study assumes that consumers made aware of their emotional state are less likely to be affected by PPR. Hence, the driving hypothesis is derived as follows:

H1: Sad people who are made aware of their altered emotional state with EST are less likely to experience PPR than people who are not made aware.

In particular, considering the four dimensions of PPR developed by Lee & Cotte (2009), four related sub-hypotheses are generated:

H1a: Sad people who are made aware of their altered emotional state with EST are less likely to experience PPR due to forgone alternatives than people who are not made aware.

H1b: Sad people who are made aware of their altered emotional state with EST are less likely to experience PPR due to change in significance than people who are not made aware.

H1c: Sad people who are made aware of their altered emotional state with EST are less likely to experience PPR due to under-consideration than people who are not made aware.

H1d: Sad people who are made aware of their altered emotional state with EST are less likely to experience PPR due to over-consideration than people who are not made aware.

3.3 Proposed conceptual model

Drawing upon the theoretical background and hypotheses development presented above, the study conceptual model is established as follows (Figure 5). The model aims to provide a basis for the hypotheses of the thesis project, i.e., explore whether the application of EST can reduce the level of PPR originating from an impulse buying behaviour. Here, the predominance of the impulsive system (S1) prevents consumers from being cognitively aware. Conversely, the use of EST would activate the reflective system (S2) and consequently restore the cognitive abilities of consumers. The model consists of one central hypothesis and four sub-hypotheses as proposed earlier.

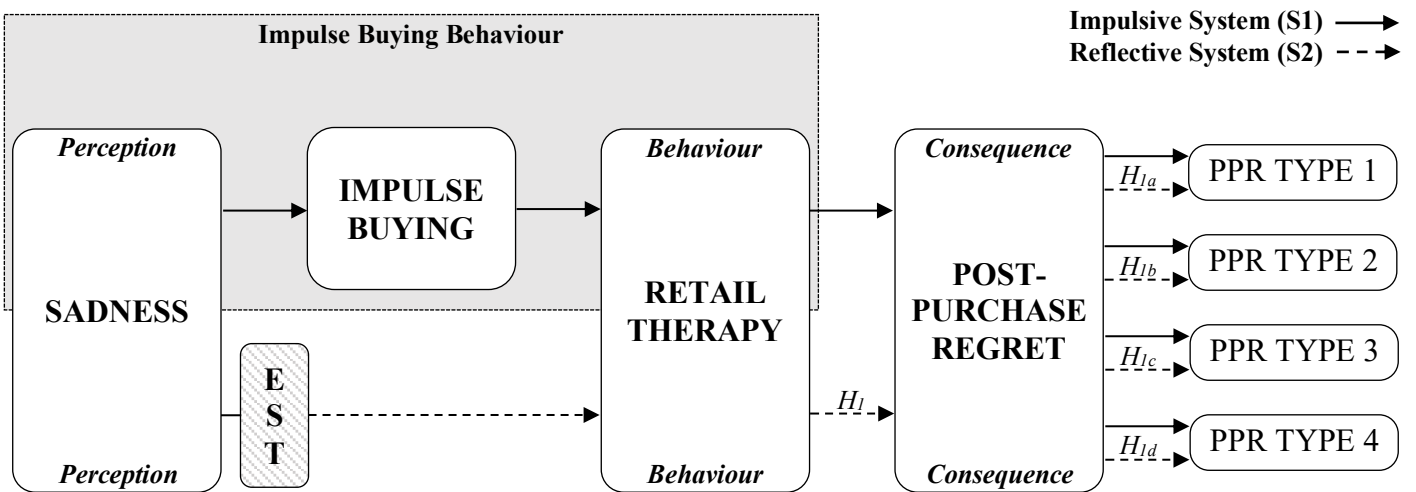


Figure 5. Own Illustration of the Proposed Conceptual Model

4. Methodology

The following chapter discusses the methodology. In particular, the paragraphs elaborate on the research philosophy as well as the approach and the design selected for the development of the thesis, including research purpose, strategy, and time horizon. An introduction to the study context is then provided, followed by technical details concerning the sampling, protocol and collection of data with the applied measurements. The section ends with an all-inclusive data analysis that is of further significant relevance to draw the conclusions of the research.

The *Research Onion* model proposed by Saunders, Lewis & Thornhill (2009) has been employed to better understand the foundations of the study and the choice of the methods and strategies to answer the research question. The framework developed by the authors suggested moving from the highest level of abstraction, i.e., external layer, to the lowest, i.e., internal layer. This entails a detailed study that starts with outlining the basic beliefs and world's views guiding the thesis project (Saunders et al., 2009); and ends with the practical application of the chosen techniques. In line with the model, each decision taken inside a layer determines the following ones. To anticipate what the thesis research onion model looks like, Figure 6 provides a graphical explanation.

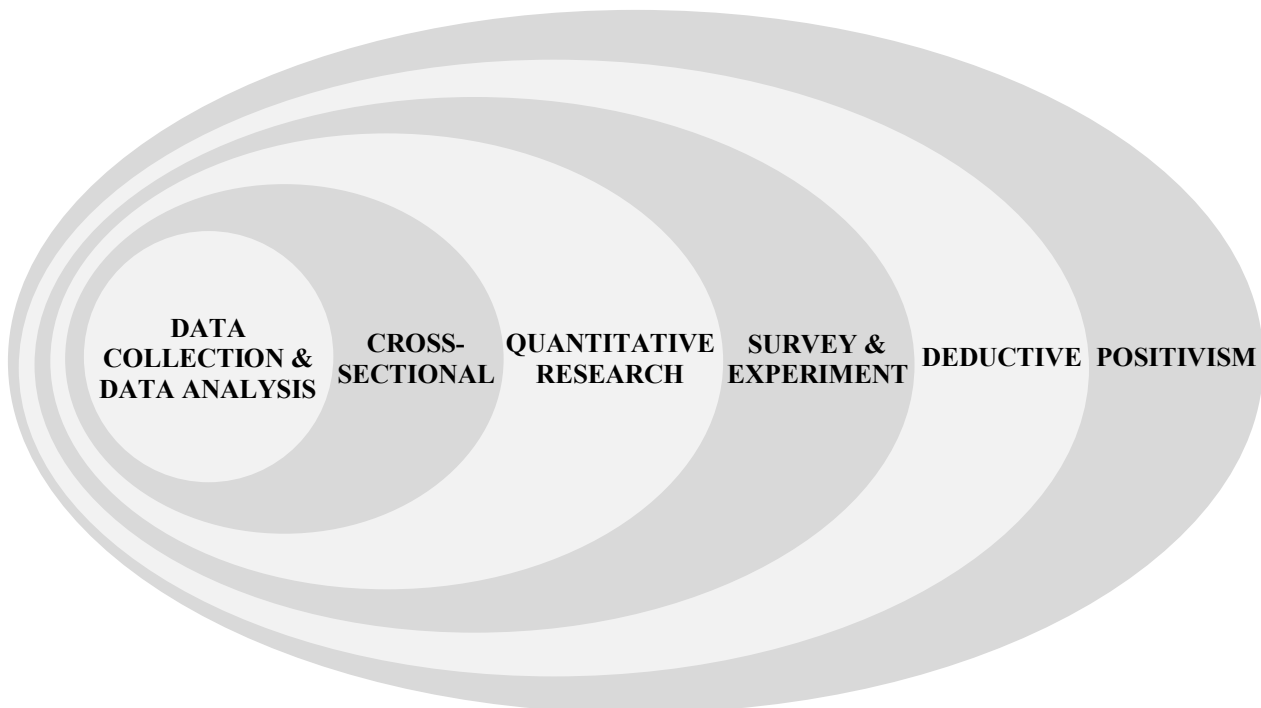


Figure 6. Own Illustration of the Research Onion Model adapted from Saunders et al. (2009)

4.1 Research philosophy: The assumptions

The first layer of Saunders et al. (2009) model refers to the research philosophy, defined as a system of assumptions about nature and the development of knowledge (Saunders et al., 2019). These beliefs have methodological implications, particularly concerning the way researchers investigate, gain information, choose data collection methods and interpret results (Burrell & Morgan, 1979). In particular, these lines of thoughts laid the groundwork for a deep understanding of how, in the current thesis project, reality and knowledge of the world are viewed. Philosophy is indeed the main foundation of any research study, and it is usually delineated based on two philosophical assumptions, namely ontology and epistemology (Melnikovas, 2018).

4.1.1 Ontology

Ontology is concerned with the nature of reality and involves the researcher's assumptions about "the way the world operates and the commitment held to particular views" (Saunders et al., 2009, p. 110). In other words, the ontological stance determines the research phenomena to focus on as well as the way to see and approach them. In this regard, philosophies can be differentiated in terms of two vital aspects, i.e., objectivism and subjectivism (Saunders, Lewis & Thornhill, 2019).

On the one side, *objectivism* incorporates the assumption of the natural sciences and refers to social and physical phenomena as factors that do not depend on how individuals see them; rather they "tend to be universal and enduring in character" (Saunders et al., 2019, p. 135). This perspective is usually represented through the streams of positivism and critical realism. The former mainly reflects the philosophy applied to the study of the natural sciences, and it denotes the objectivist assumptions based on the observability of entities, external events and social actors (Melnikovas, 2018). Therefore, positivism affirms that the reality is external and objective, and a credible representation can be obtained only through observation and empirical data (Easterby-Smith, Thorpe, & Jackson, 2015). Differently, critical realism "focuses on explaining what we see and experience, in terms of the underlying structures of reality that shape the observable events" (Saunders et al., 2019, p. 147). Specifically, this view is explained through two crucial steps: (1) people experience events and sensations and, often after those experiences, (2) they tend to reason backwards to examine the bigger picture or "the underlying reality that might have caused them" (Saunders et al., 2019, p. 147).

On the other side, Saunders et al. (2009) rationalised that *subjectivism* embraces the assumptions of the arts and humanities, holding that “social phenomena are created from the perceptions and consequent actions of social actors” (p. 129). In particular, the subjective ontology lays the foundation of the interpretivism philosophy, which affirms that “humans are different from physical phenomena because they create meanings” (Saunders et al., 2019, p. 149). Therefore, interpretivism considers individuals’ cultural backgrounds, languages and history in the shaping of meanings and perceptions.

The current research aims to examine whether being aware of one’s emotional state during an impulsive purchasing activity might diminish the chance to experience PPR. Here, key factors that play a specific role are the physiological alteration of the emotional state pre-purchase (i.e., incidental sadness), the impulse buying urge preceding the shopping activity, and the ensuing feeling of PPR. In this regard, the origin of sadness and the type of regret that a person experiences are subjective, thus potentially varying from individual to individual. However, the relation between a negative emotion and the urge of buying, as well as the consequent feeling of PPR, is an objective reality – as literature in consumer behaviour has previously demonstrated. Hence, the presented thesis project adopted the ontology of objectivism, due to the premise that such factors do not depend on how individuals interpret them; rather they tend to happen without people realising them (Strack & Deutsch, 2004).

4.1.2 *Epistemology*

Once the ontological stance of the nature of reality has been outlined, the type of knowledge used in the research must be defined. In line with what just questioned, the concept of epistemology is of vital importance. This refers to “the assumptions about the grounds of knowledge – about how one might begin to understand the world and communicate this as knowledge to fellow human beings” (Burrell & Morgan, 1979, p. 1). Therefore, epistemology helps understand what makes knowledge tolerable, valid and legitimate, and how this can be communicated to others (Saunders et al., 2019). Epistemologically speaking, the objectivist philosophy focuses on discovering the truth through observable and measurable data and facts (Saunders et al., 2019). On that account, objective ontology adopts the assumption of the natural sciences and observable facts, implying a reflection in the philosophies of critical realism and positivism (Saunders et al., 2009).

With respect to the former, critical realists embraced the so-called epistemological relativism, which recognises that “knowledge is a product of its time and is specific to it, and that social facts are social constructions agreed on by people rather than existing independently” (Saunders et al., 2019, p. 147). This implies that critical realism cannot be reduced to statistical correlations or quantitative methods, instead calls for a more subjectivist view (Saunders et al., 2019). In contrast, positivist researchers focused on discovering observable and measurable facts that produce credible data. In this case, it is fundamental to have a deep understanding of whether causal relationships in the data exist to ultimately create law-like generalisations (Saunders et al., 2019).

The current thesis hence agrees with the epistemological stance of positivism. Indeed, the project primarily focused on observable social reality while including the use of a number of existing theories from which the hypotheses were drawn and tested (Saunders et al., 2009). Moreover, in line with Easterby-Smith, Thorpe and Jackson (2015), the positivist approach fits the presented thesis model, as the researchers are external and independent from the researched variables, and they limit their work to observe facts, rather than put intuition and interpretation of the reality in place.

4.2 Research approach to theory development

In conformity with the assumptions of positivism, Saunders et al. (2009) claimed that this type of research conventionally involves a vast amount of existing theoretical work, which lays the ground for the thesis development. This approach, commonly referred to as deductive, entails a shift from the general – where previous literature is considered – to the particular, where the hypotheses are developed and tested (Woiceshyn & Daellenbach, 2018). The deductive method indeed implies a deep comprehension of the extant theoretical groundwork and points out missing research gaps, which are deemed to hold interesting content to the research.

On this account, deductive researchers firstly infer the hypotheses from the theory, then collect data and use statistical methods to test them, and finally prove whether a relationship exists between the variables in question (Woiceshyn & Daellenbach, 2018). Finally, the last step consists of discussing the findings and verifying whether the results confirmed or modified the existing theoretical groundwork (Saunders et al., 2009).

The current thesis project precisely followed a deductive approach, where existing theoretical frameworks have been considered to address the research gap identified. In particular, an extensive academic review has been conducted with respect to consumer research, including rational and irrational consumption, the impact of emotions on consumer behaviour, incidental sadness and related appraisal of situational control, retail therapy, and consequent PPR. This latter was based on the conceptual framework proposed by Lee and Cotte (2009). Finally, the frame of reference that shaped the thesis conceptual model consisted in the dual-system RIM framework developed by Strack and Deutsch (2004).

4.3 Research design

The previous sections defined both the philosophy and approach followed by the research in order to identify the assumptions shaping the way to the proposed research question as well as the methods to be employed for the analysis and the findings interpretation. The current paragraph introduces the research design, i.e., the plan of how to answer the research question and turn goals into a planned research project (Saunders et al., 2009). In particular, objectives, strategy, and time horizon of the thesis are discussed. Furthermore, each step of the research design is adjusted coherently with the appointed research philosophy and approach (Saunders et al., 2009).

4.3.1 Research purpose

Before focusing on which strategy a research should pursue, it is fundamental to categorise its purpose. Precisely, a research purpose is classified on a threefold nature, which can result in either exploratory, descriptive or explanatory research, as well as a combination of them all (Saunders et al., 2009).

Since the presented thesis project aims to assess whether being aware of one's altered emotional state with the help of EST diminishes the feeling of PPR, the main purpose of the project can be classified as explanatory. Its object is indeed by definition to "examine and explain relationships between variables" (Saunders et al., 2009, p. 362). This is in line with the current research, which seeks to establish a link between awareness and the sense of regret arising after an impulsive shopping activity; in other words, evaluate if the factor awareness impacts PPR.

Nonetheless, some parts of the research project also assumed a descriptive character, especially regarding the purpose of creating an emotional baseline of sadness. In this particular instance, and in the subsequent use of surveys to control the emotional induced stimuli of the participants, the research was intended as descriptive. Indeed, it aimed to “identify and describe the variability in different phenomena” (Saunders et al., 2009, p. 362) by portraying an accurate profile of the person (Robson, 2002 in Saunders et al., 2009), i.e., the individual with a sad emotional state. This was, however, only a limited part of the aforementioned explanatory research – hence, as pinpointed by Saunders et al. (2009), it must be intended as “a means to an end rather than an end in itself” (p. 140).

In conclusion, the presented study can be defined as *descripto-explanatory* since its objective is mainly explanatory, and the descriptive part acts as the premise to a subsequent major explanation (Saunders et al., 2009).

4.3.2 *Research strategy*

After delineating the purpose of the thesis project, the third layer of the research onion model embodies the layout of the strategy followed (Saunders et al., 2009). In this respect, the chosen strategy should answer the research question and meet the objective of the thesis; while drawing upon the amount of existing knowledge and philosophical stances assumed so far (Saunders et al., 2009). Thus, in line with the positivist research philosophy and the selected deductive approach, the current study followed a quantitative approach, regarding both the type of data gathered and how they were analysed (Saunders et al., 2009).

In particular, the strategies utilised consisted of a central experiment and two related structured surveys. For what concerns their general application, Saunders et al. (2009) claimed that experiments tend to be used in explanatory research, addressing a “why” question. They indeed work towards recreating a desired situation that the researcher wants to study, leading to major control over the design, procedure and participants (Hox & Boeije, 2005). In particular, since the purpose of an experiment is to study whether “a change in one independent variable produces a change in another dependent variable” (Saunders et al., 2009, p. 142), the application of this technique appeared to be the most appropriate strategy in regard to the current study, specifically in observing how consumers behave under certain conditions and states.

The recreation of a real purchasing activity through an experimental session was an especially accurate method in relation to the presented thesis project. Indeed, experiments allow a comparison between two groups that are “exactly similar in all aspects relevant to the research other than whether or not they are exposed to the planned intervention or manipulation” (Saunders et al., 2009, p. 142). With respect to the current study, the variable awareness represented such intervention.

More specifically, it was of primary interest to observe whether:

- a. Participants exposed to negative emotionally charged stimuli and made aware of their emotions through EST were more inclined not to engage in retail therapy.
- b. Participants exposed to negative emotionally charged stimuli and made aware of their emotions through EST experienced post-purchase regret after engaging in retail therapy.
- c. Participants exposed to negative emotionally charged stimuli and not made aware of their emotions through EST experienced post-purchase regret after engaging in retail therapy.

As for the use of surveys, Saunders et al. (2009) sustained that this technique is usually associated with a deductive approach. Indeed, this type of strategy facilitates finding certain relationships and differences between the variables under study (Saunders et al., 2009). Moreover, according to the same authors, questionnaires allow the collection of quantitative data, which can subsequently be analysed using descriptive and inferential statistics – as it was performed in the presented research.

4.3.3 *Time horizon*

Finally, the research time horizon is herein considered. In contrast to the previous layers of the research onion model (Saunders et al., 2009), this aspect remains independent from all the other facets determined in the course of the framework. According to Saunders et al. (2009), it is essential to determine whether the research is cross-sectional or longitudinal. In particular, while the former studies the phenomenon at a specific point in time, the latter observes events over a continuous period of time. In the case at hand, as it often occurs in academic research (Saunders et al., 2009), the time constraints imply a cross-sectional research option.

4.4 Data collection

The collection of data involves two different types of information: primary and secondary. On the one hand, primary data refer to all the facts that the researcher gathers first-hand for the investigation (Rabianski, 2003). On the other hand, secondary data include existing sources, which give access to relevant, additional knowledge; in other words, “data originally collected for a different purpose and reused for another research question” (Hox & Boeije, 2005, p. 593).

4.4.1 Primary data

The current thesis gathered its primary data through a pre-test survey, followed by the actual experimental session and two final questionnaires – one of which determined the source for answering the study research question. During the experiment, the principal sources of data comprised the physiological information of the participants, which needed to verify whether their emotional state was successfully altered. In particular, the data entailed the individuals’ electrodermal activity (EDA), obtained through the use of Empatica E4, a wearable device that offers real-time physical data acquisition (Empatica, 2020). Its technicalities are later introduced in section 4.8.1. Additional primary data consisted of two self-administered questionnaires aimed at a) controlling for mood manipulation and b) answering the research question on whether being aware of one’s emotional state diminishes PPR (Appendix A and B, respectively).

4.4.2 Secondary data

The secondary data collected during the drafting of the presented project encompassed a number of studies previously researched within the same area of interest of the thesis topic. In particular, these sources included peer-reviewed articles, journals, and books. These data were used to a) review the extant literature and outline the research gap; b) take inspiration from earlier experiments within the consumer behaviour field to understand how to subject the participants to certain stimuli and recreate a realistic shopping activity; and c) have a theoretical basis for the hypotheses development, research approach and discussion of results. Aligned with this purpose, the platform of Google Scholar and the online library database provided by CBS acted as main sources to find and collect the data.

4.5 Sampling

Aligned with the research question that the thesis project aims to address, the study did not require any specific geographic location, or any precise target of individuals, particularly in terms of demographics. Consequently, the experimental session has been entirely conducted in Copenhagen, Denmark.

In relation to the study population, the sample included both students from Copenhagen Business School and Københavns Universitet as well as friends. In this regard, the applied sampling technique was the so-called *non-probability sampling* (Taherdoost, 2016). Besides being often adopted in case study research, this approach focuses on small samples and is often applied to examine a real-life phenomenon (Taherdoost, 2016).

In addition, the non-probability sampling utilised in the current study involved a *convenience sampling*, defined by Rahi (2017) as “a population that is proximate and easily accessible to the researcher” (p. 3). This type of sample lightens the limitations associated with research when unknown individuals are involved. In contrast, using friends or family as participants in an experiment is considered a simpler approach (Taherdoost, 2016), allowing the researcher to obtain answers in a cost-effective way (Rahi, 2017).

In particular, 23 volunteering subjects (16 female versus 7 male) currently based in Copenhagen were invited to take part in the experiment after signing an informed consent form and receiving a small incentive for contribution. Although the participants’ demographic data were not considered relevant in pursuing the study, some general information was asked, including age, profession and nationality. In this regard, participants’ age ranged from 23 to 35, with a mean age of 26 years old. The majority of individuals were students (57%), while the remaining 43% included both neo-workers and currently unemployed. Finally, in terms of country of origin, 17 individuals came from Italy, followed by 3 people from Denmark, and 3 people from Austria, Hungary and Slovenia, respectively.

4.6 Protocol

4.6.1 Materials

For the purpose of establishing a baseline of sadness in participants, literature on the field generally suggested that several techniques can be applied to stimulate an individual's emotion. In particular, watching segments or scenes in movies has been accounted for successfully evoking an emotional response (Lim, Mountstephens, & Teo, 2020). For this reason, a film sequence was selected to control the emotional content. Ground truth was defined based on a preliminary study conducted through an online questionnaire designed on Google Forms and distributed across different social media sites, e.g., Instagram, LinkedIn, WhatsApp and Facebook. Here, valence scores were given to four different video-clips with extrinsic emotional content, selected from three movies and a cartoon. The highest-scoring clip was taken from the movie *Marley & Me* (2008) and was presented on a MacBook Air 2019 13" positioned on a table in the middle of the room.

In addition, to recreate the online shopping activity that participants engaged in during the experiment, a fictional website offering products of hedonic nature was specifically designed on Wix.com. Alongside, the same marketing platform was used to create a customised email confirming the order delivery for each participant. Thereafter, similarly to the preliminary test, Google Forms was used to develop the subsequent two surveys aimed at (1) controlling the emotional manipulation and (2) checking whether participants experienced PPR.

Finally, the Empatica E4 wristband was employed to track and subsequently analyse the subjects' EDA. In turn, the web platform E4 Connect was used to show the alterations in the emotional state, thereby acting the purpose of making the participants aware of their emotion.

4.6.2 Procedure

The following section introduces the experiment setting and outlines the specifics of the investigation. In particular, the six fundamental steps contained in the experimental procedure are described in detail (Table 1).

Part 1 – Week 10

STEP 0 <i>Welcoming</i>	<ol style="list-style-type: none">1. Brief introduction to the experiment2. Set-up of participants on the experiment station
STEP I <i>EDA Baseline Measurement</i>	<ol style="list-style-type: none">1. Start of EDA baseline measurement2. Calibration of Empatica E4 wristband3. Response of participants to neutral questions
STEP II <i>EDA Emotional Input Measurement</i>	<ol style="list-style-type: none">1. Projection of sad movie-clip “Marley & Me”2. Start of EDA emotional input measurement3. End of EDA measurement<ol style="list-style-type: none">a. Treatment group made aware of alterations in emotional stateb. Control group experiment continuation
STEP III <i>Online Purchasing Activity</i>	<ol style="list-style-type: none">1. Transfer of 100kr to participants and exposure to the choice of:<ol style="list-style-type: none">a. Purchasing a product from the online storeb. Keeping the money and bringing it home2. Exposition to participants of the online store
STEP IV <i>Manipulation Check Survey</i>	<ol style="list-style-type: none">1. Response of participants to manipulation check survey
Part 2 – Week 11 <hr/>	
STEP V <i>PPR Survey</i>	<ol style="list-style-type: none">1. Delivery of ordered products to participants2. Response of participants to PPR survey<ol style="list-style-type: none">a. PPR survey addressed to treatment groupb. PPR survey addressed to control group
STEP VI <i>PPR Survey Collection</i>	<ol style="list-style-type: none">1. Collection of response of participants to PPR survey

Table 1. Overview of the Experimental Procedure

The study was divided into two parts over weeks 10 and 11 of the current year. During week 10, all 23 participants took part in the experimental session individually (Steps 0-IV). In particular, about four to five participants have been tested every day for a total of five days throughout the course of the week.

At the beginning of the individual experimental session (Step 0), the selected subject was invited to take a seat in a comfortable chair and asked to wear the Empatica E4 wristband. The recording equipment was then checked and aligned when needed. A rest period of approximately 2 to 4 minutes was taken into account. In Step I, the data acquisition of the EDA baseline started (Step I.1). While the measuring tool was in its calibrating phase (Step I.2), the subject was requested to answer a short questionnaire, including a number of neutral questions about his or her personal data (Step I.3).

Thereafter, in Step II.1, the participant was shown the video clip aimed at inducing the expected emotional stimulus of sadness. At this particular moment, the measurement of the EDA emotional input started (Step II.2). Once the video clip ended, the EDA tracking was stopped, and the session was uploaded to the E4 Connect cloud server (Step II.3). In the same step of the process, the experiment could take two distinctive paths: a random half of the participants, referred to as the treatment group, was made aware of their emotional state (Step II.3.a), while the rest of the participants, namely the control group, did not receive any feedback (Step II.3.b).

Whilst the control group directly moved onto the next phase, the treatment group was exposed to the E4 Connect web platform, in which EDA data could be easily visualised in a graph. Specifically, this included a zoomable and pannable plot depicting signals and peaks (Figure 7). The participants then received a brief elucidation on the functioning of the EDA measurement and its relation to the ANS. Simultaneously, they gained information about the exact point in time during which the movie clip started (red dotted line in Figure 7) to further ease their process of distinction between the two tracked periods. This step represented a key part of the experiment, as the treatment group was made aware of their physiological activity and the alterations in their emotional state.

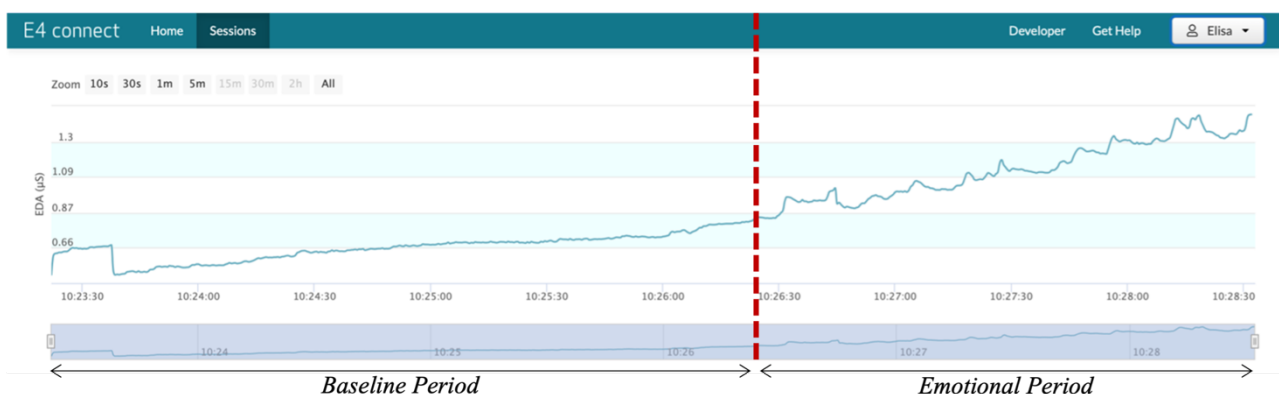


Figure 7. Visualisation of Step II.3.a

Subsequently, Step III of the experimental procedure took place. All individuals received an amount of DKK 100 each via MobilePay, and they were asked to make a choice: either use the money to purchase a product (Step III.1.a) or keep the amount and bring it home (Step III.1.b). For the purpose of recreating a real purchasing activity and not influencing them during the video clip, the individuals were not aware of having received the money until the purchasing activity phase started. Thereafter, the participants were exposed to the online store (Step III.2). Here, they could choose among 48 products of hedonic nature, including makeup, skincare, perfume and deodorant, jewellery, bags, winter accessories, chocolate and sweets, and home decorations. Figures 8 and 9 showcase the homepage of the webstore and part of the selection of the hedonic products, respectively.

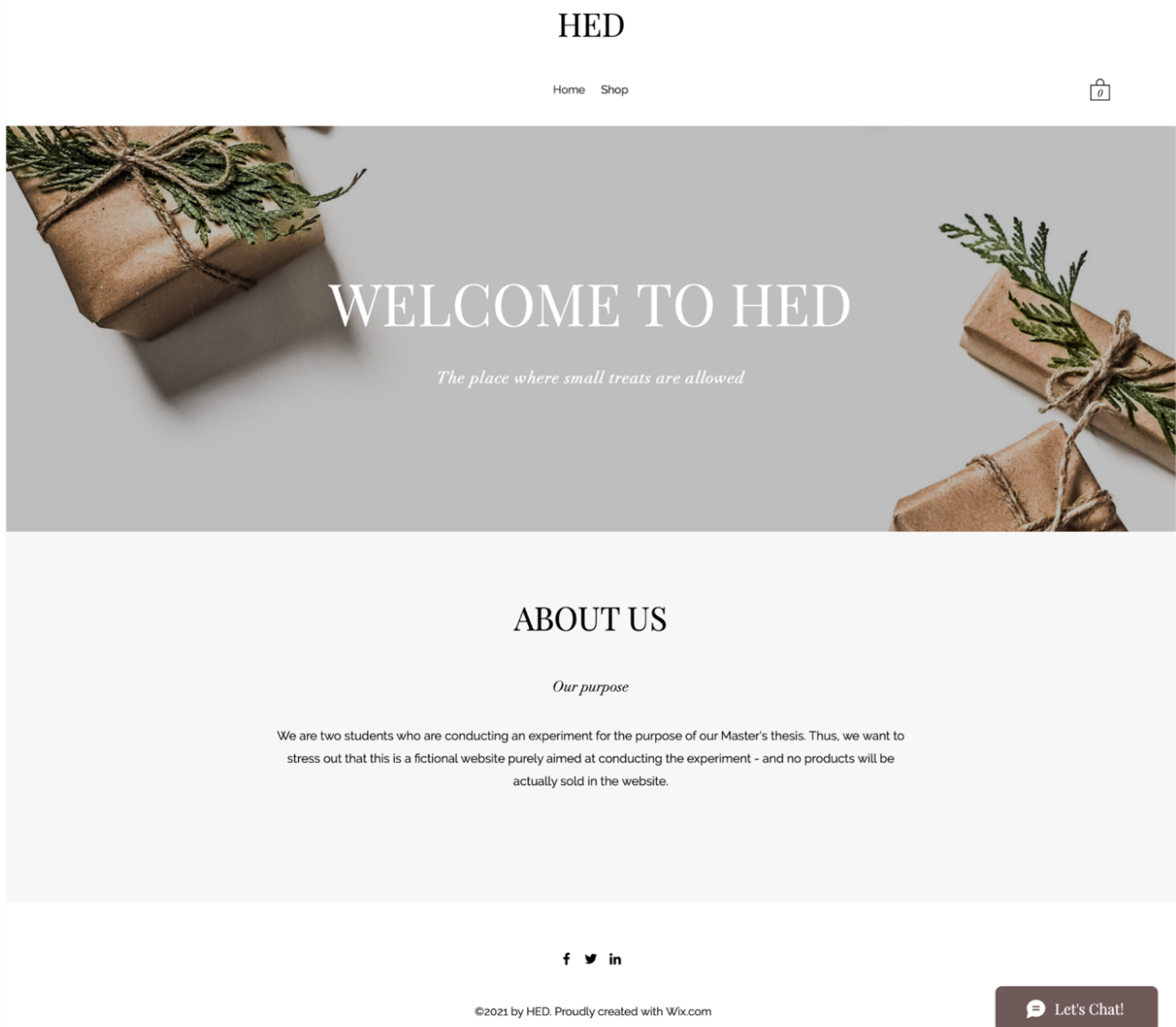


Figure 8. Homepage of the Fictional Online Store retrieved from Wix.com

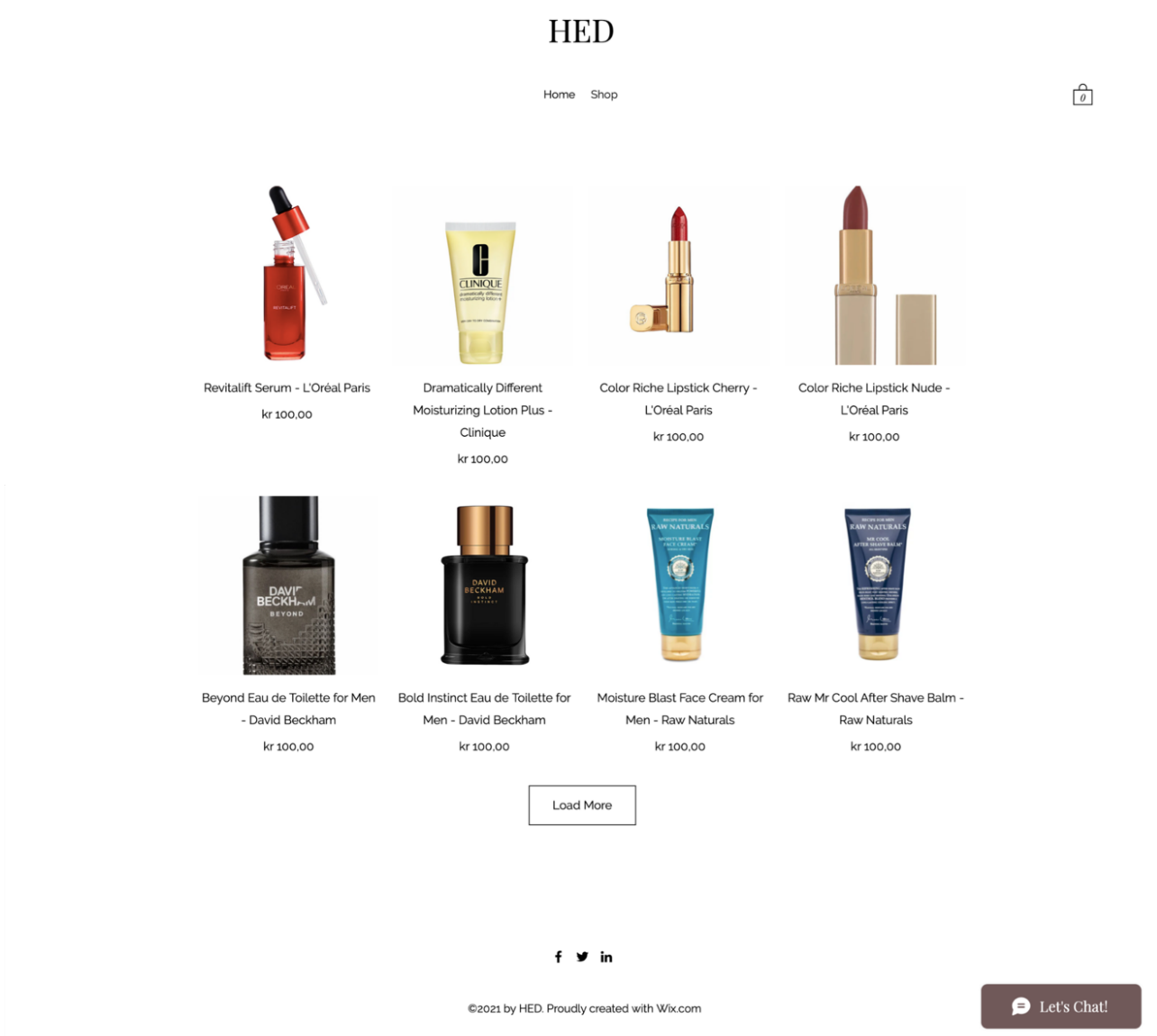


Figure 9. Example of a Selection of Fictional Products retrieved from Wix.com

To reduce the *Hawthorne effect*, i.e., people behaving differently while observed, thereby leading to potential, unexpected outcomes (Merrett, 2007), participants were left alone during the online purchasing activity. Afterwards, they had to report their purchase intention: whether to keep the money or buy one of the offered products. Subsequently, in the final phase of the first part of the experiment (Step IV), manipulations for the emotions elicited by the video clip were included using a questionnaire (Step IV.1). Indeed, to verify that participants experienced sadness, they were asked to fill out a survey including both a sequence of generic questions about the overall experience and specific questions regarding their emotional state when exposed to the video.

On week 11, the second part of the experiment began. Here, only the participants who decided to buy a product were involved. Step V of the experiment aimed at recreating the post-purchase situation where consumers receive the products ordered online. Therefore, after 5 to 7 days from the placement of the orders, the products were delivered to the participants' home addresses (Step V.1). On the same day, the individuals received an email including both the delivery confirmation and a survey aimed at understanding the level of PPR (Appendix C). In this regard, two different surveys have been sent out. The first one was destined to the individuals made aware of their emotional state, thereby containing an additional question on the influence of EDA on their purchasing decision (Step V.1.a). Conversely, the second one was addressed to the participants who did not receive any feedback, and it included only the questions related to PPR (Step V.2.b). The second part of the experiment ended once all the surveys had been filled out (Step VI).

4.7 Measurement

4.7.1 Measurement of physiological data

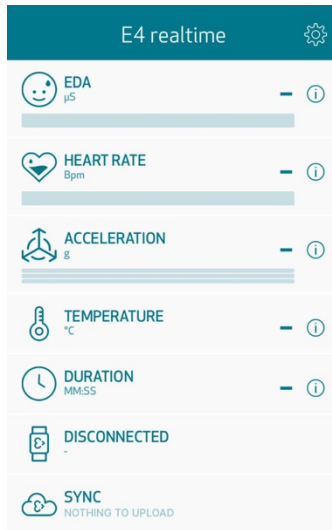
EDA was the objective parameter used to measure unconscious responses of physiological arousal. As already outlined, this was chosen because of its autonomic nature: in contrast to behavioural responses, which entail skeletal muscles (Kosonogov et al., 2017), physiological responses cannot be controlled by the users (Westerink et al., 2008). In addition, EDA was considered optimal as (1) it represents one of the most useful indices of changes in sympathetic arousal related to emotional and cognitive states (Braithwaite et al., 2015) and (2) has often been employed to measure the emotional value of a stimulus (Borrego, Latorre, Alcañiz, & Llorens, 2019).

Also named Galvanic Skin Response (GSR), EDA is a low-cost measure for emotion-sensing, involving the analysis of skin conduction parameters (Dzedzickis, Kaklauskas, & Bucinskas, 2020). Since electrical parameters of the human skin are not under conscious control (Udovičić, Derek, Russo, & Sikora, 2017), GSR is a valuable method that quickly detects emotional changes and brings significant information beyond usual verbal and non-verbal behaviours. Indeed, when experiencing emotional and cognitive arousal, the brain usually sends signals to the skin that increase the level of sweating, which is hardly perceivable by people on the surface of their skin (Empatica, 2020).

Specifically, GSR analyses the autonomic nervous system (ANS) activity and subsequent skin reactions when an individual is exposed to both positive and negative emotionally charged stimuli (Borrego et al., 2019). These reactions activate the sweat glands in the human body and make them more active (Ayata et al., 2016). In turn, a discrete quantity of salt is produced in the human skin, which alters the balance of positive and negative ions, thereby affecting the electrical parameters of the human skin (Ayata et al., 2016). In other words, GSR describes all the electrical phenomena of the skin caused by variation in sweat reactions, reflecting changes in ANS: if its arousal level increases, sweat glands produce more sweat; consequently, skin conductivity rises as well (Dzedzickis et al., 2020; Westerink et al., 2008).

Concerning the current thesis project, GSR was measured with Empatica E4 – a wearable wireless wristband designed for a non-stop and real-time tracking of physiological data by Empatica, an Italian company based in Milan (Garbarino, Lai, Tognetti, Picard, & Bender, 2014). Empatica E4 is a wearable biosensor equipped with two sensors located in the wristband strap, which enable the acquisition of real-time EDA data at a frequency rate of 4Hz (Borrego et al., 2019). Essentially, the wristband captures electrical conductance, measured in microSiemens (μS), by conveying a small amount of current between the two electrodes in contact with the skin (Empatica, 2020). As aforementioned, since the ANS controls sweat glands, EDA can be used as an indication of psychological arousal (Garbarino et al., 2014). To ensure the validity of Empatica E4 as a technology that detects physiological signals, van Lier et al. (2019) conducted a study that confirmed the wireless wristband efficacy for the entire magnitude of GSR.

As exposed in the presentation of the experimental session (section 4.7.2), the participants' physiological data were collected in real-time on a mobile device through the E4 Realtime streaming app available from mobile online stores. After creating an account and logging into the smartphone application, a user interface becomes available, as pictured in Figure 10. This application enables users to connect to the devices through Bluetooth. Figure 11 shows the interface after the data start streaming, where the various graphs help to follow the real-time streamed data.



CONNECT E4 AND START RECORDING

Figure 10. Initial User Interface retrieved from E4 Realtime

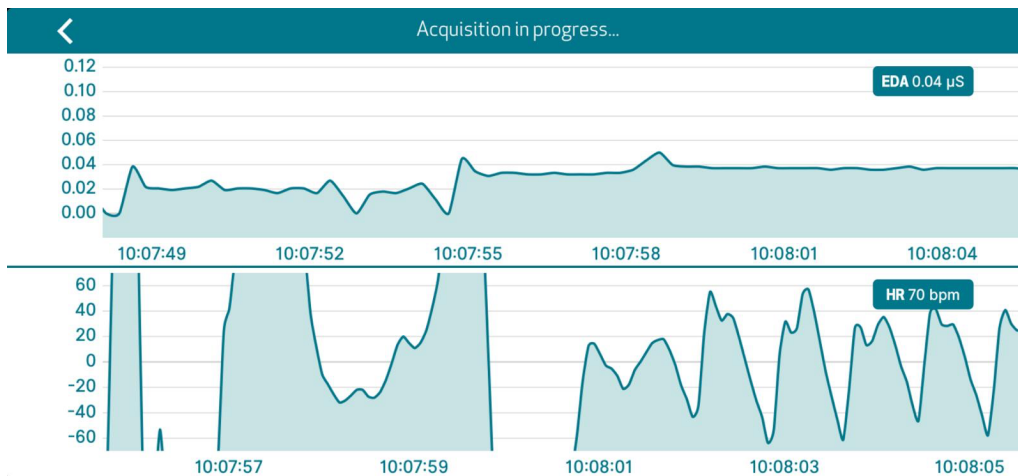


Figure 11. Example of a Measurement Recording retrieved from E4 Realtime

At the end of the acquisition, each session was uploaded to and stored in the E4 Connect web platform – a cloud server where it is possible to access and review all the sessions recorded after logging in (Garbarino et al., 2014). An example of the outcome of the measurement is presented in Figure 12. The first graph in blue shows the EDA reading, which is the interest of the research project. The following graphs display the blood volume pulse, acceleration, heart rate and temperature respectively, which are however not considered for analysis.

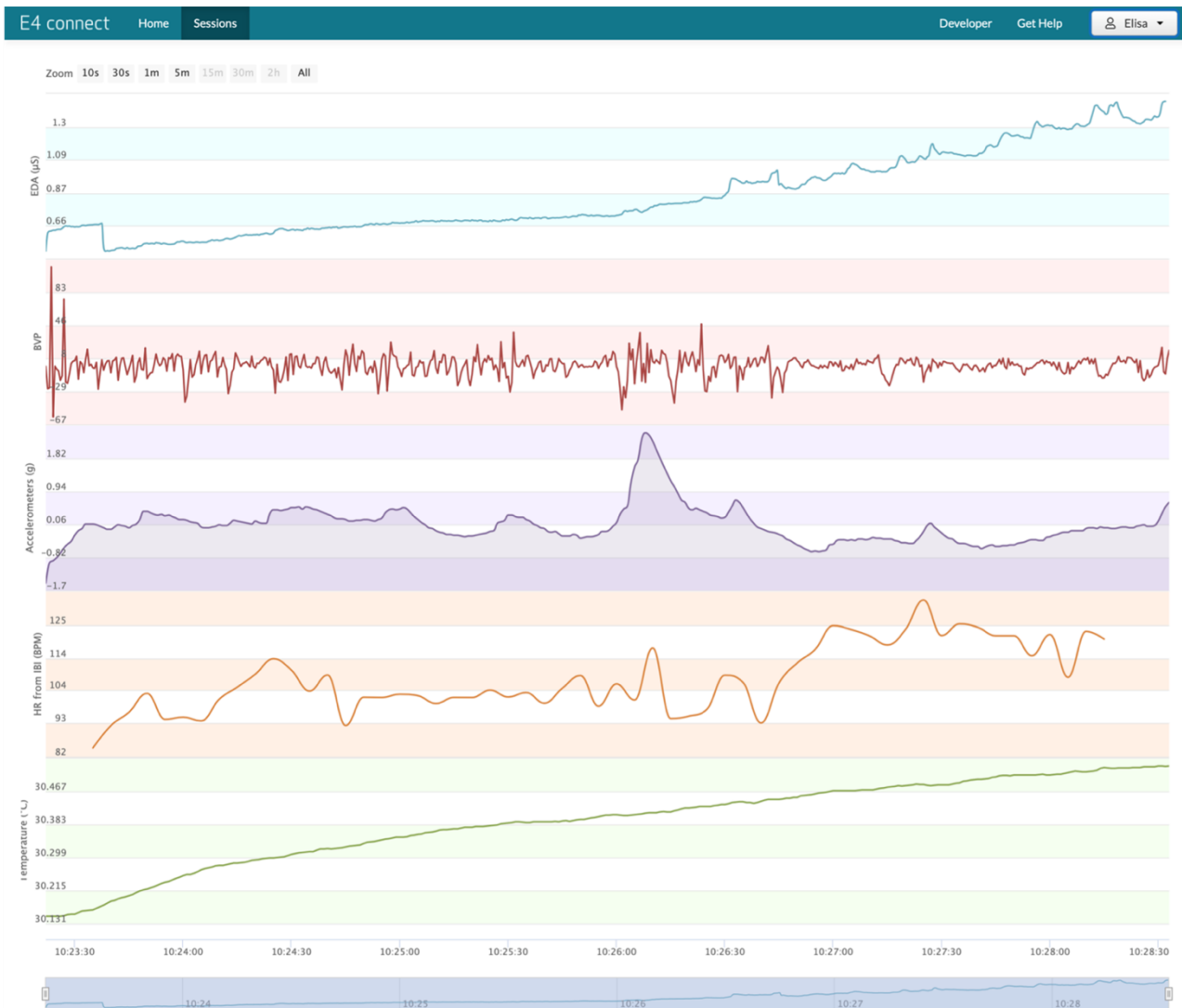


Figure 12. Example of an Uploaded Session retrieved from E4 Connect

4.8.2 Measurement of surveys data

Since questionnaires must be developed precisely to collect accurate and realistic data, the surveys took into account precious insights from previous research on systematic measurement errors. In particular, the issue of *common method variance* (CMV) was considered, as it might jeopardize the validity of the survey findings (Podsakoff, MacKenzie & Podsakoff, 2012). This leads to a phenomenon called *common method bias* (CMB), described as the magnitude of the discrepancy between the observed and the actual survey results (Doty & Glick, 1998 in Podsakoff et al., 2012).

According to Jakobsen and Jensen (2015), three of the main factors of CMB include (1) consistency motives, referring to “the tendency of respondents to provide consistent answers across items” (p. 6); (2) social desirability, implying to answer in a way that makes the participants look good; and (3) complex and ambiguous survey items and language. To face the recurrent issue of CMB, one of the approaches to minimise the likelihood of this phenomenon consists in strengthening the design and structure of the questionnaire itself (Jakobsen & Jensen, 2015).

In the current study, the surveys were therefore based on unbiased, clear and language-accurate statements (Podsakoff et al., 2012). In addition, all the questions were drafted on the same scale but with different designs, in order to prevent the participants from answering the same way repeatedly. Lastly, to avoid social desirability issues, anonymity of the responses was assured and the existence of no correct or preferred answers was specified (Reio, 2010).

The preliminary survey worked towards controlling the emotional content. Through the question “*How did you feel while watching the video clip taken from ---?*”, the goal consisted of identifying which film sequence, selected from three movies and a cartoon, was triggering the saddest emotional reaction. To avoid ambiguity, the question was closed-ended and included seven possible answers, entailing different dimensions of affect – fear, anger, sadness, disgust, boredom, anxiety, and indifference. This structure allowed respondents to deliberately choose among several emotional states, ensuring a general level of unbiasedness. In particular, 83 out of the 92 total respondents indicated that the clip retrieved from the movie “Marley and Me” provoked a sad emotional state (90.2%). Results are shown in Figure 13. Consequently, it was considered safe to proceed by deploying that specific video clip to induce an emotional baseline of sadness.

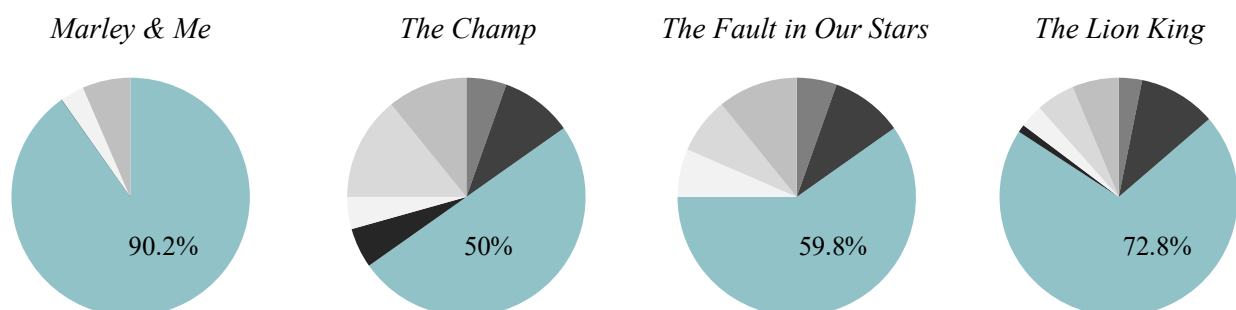


Figure 13. Overall Results from Preliminary Survey (Sadness %)

On a different matter, the first survey was aimed at controlling mood manipulation and induction of the emotional response. Therein, a 5-points Likert measurement scale has been applied, described as a set of statements referring to either a real or hypothetical situation and aimed at measuring attitudes or opinions (Joshi, Kale, Chandel, & Pal, 2015). Despite the choice of developing the questions with different designs, a single-item scale was preferred to maintain a simple and clear survey structure (Appendix A). For instance, this scale required the surveys' respondents to show their levels of both appreciation and affect with given statements on a metric scale where 1 = *very bad* and 5 = *very good*, 1 = *no affect* and 5 = *major affect*, 1 = *not at all* and 5 = *hugely*.

The questionnaire, divided into two sections, involved eight Likert-type items. In particular, five questions assessed the general participants' opinion on the experiment, while the remaining three worked towards a better understanding of participants' emotional sphere. The reason behind the decision to also include generic questions in the survey consisted in preventing the participants from realising that their emotions were manipulated through the sadness-inducing video clip. Specifically, the question "*While watching the video clip, to what extent were you affected by one (or more) of the following emotions?*" served as a control method to verify whether the emotional baseline of sadness was successfully elicited. The item included sadness – as the emotion targeted by the movie clip – as well as additional dimensions of negative affect (Gross, Fredrickson, & Levenson, 1994), namely, fear, anger, disgust, boredom, anxiety; and a neutral state, i.e., indifference (Appendix A).

Differently, the second survey – aimed at answering the thesis research question – was diversified between control and treatment groups. In the former, the key variable of PPR was measured. Specifically, the questionnaire contained sixteen Likert-type items, and all variables were based on 5-point scale ratings. To ensure the validity of the research, the survey has been constructed based on the theory and related PPR's scale developed by Lee and Cotte (2009). The items used were the same implemented by the authors: four questions for each of the four sub-segments, namely (1) regret due to forgone alternatives, (2) regret due to change in significance, (3) regret due to under-consideration, and (4) regret due to over-consideration (Lee & Cotte, 2009). Here, the participants were asked to show their level of agreement with given statements, for a total of sixteen questions anchored by a scale of 1 = *strongly disagree* and 5 = *strongly agree* (Appendix B).

In contrast, the survey sent to the treatment group included the variable of PPR and the variable of reflectiveness related to one's emotional state. This was obtained through the question: "*To what extent did you think about your EDA and emotional alterations during your purchasing decision?*" anchored by a scale of 1 = *not at all* and 5 = *hugely*. This served as a control to verify whether the treatment group actually reflected upon the altered emotional state, thereby ensuring a rise in cognitive abilities necessary to activate the reflective system (S2) presented in the RIM model (Strack & Deutsch, 2004).

Lastly, both types of questionnaires contained a final question, specifically aimed at controlling that the shopping activity was indeed able to restore a positive mood. In line with the definition of retail therapy as a means for consumers to cheer themselves up through the purchase of self-treats (Atalay & Meloy, 2011), the question was posed as follows: "*To what extent did buying the product make you feel better while doing the experiment?*". Also in this case, answers were developed on a 5-point scale rating ranging from 1 = *not at all*; to 5 = *hugely*. See Appendix B for further details.

4.8 Data analysis

The collected data obtained throughout Step I, Step II, Step IV and Step V (Table 1) of the experiment were in their basic raw form, conveying little meaning to the research. In this regard, Saunders et al. (2009) highlights that it is necessary to process and analyse the data to use them and draw conclusions from them. In particular, the author suggested using different techniques, including graphs, charts, and statistical analyses, intending to "explore, present, describe and examine relationships and trends" (Saunders et al., 2009, p. 414).

4.8.1 EDA data analysis

To check for the emotional manipulation imposed during the video clip phase, the EDA signals of all 23 participants were measured with the Empatica E4 wristband. In particular, the E4 Realtime mobile application monitored 0.25 sec-by-0.25 sec of the EDA physiological measure through the entirety of Step I and Step II of the experiment. A neutral period (Step I) was used to provide a baseline against which the sadness-inducing video clip effects could be compared (Rottenberg, Gross, Wilhelm, Najmi, & Gotlib, 2002).

In both steps of the experiment, the stream was monitored to ensure the validity of the collected data. However, during this time of the analysis, the EDA data of one participant appeared to be corrupted, meaning that the individual's total physiological measurement was dropped and not further analysed. As the problem occurred during the experiment, the subject was not interrupted and completed the procedure like the remaining 22 participants. Also, since the participant's EDA measurement was contaminated during the tracking period, the individual's emotional state could not be verified. Therefore, every subsequent step of the experiment would have led to unreliable conclusions. In the same line of thought, the participant's answer to the PPR survey was identified and excluded from the analysis.

At the end of each recording, all the measurements were stored and subsequently downloaded from the E4 Connect cloud platform in CSV format to facilitate the import into any data analysis tool (Garbarino et al., 2014). In particular, each EDA reading was initially imported in Excel, which was first used to identify and subsequently distinguish between the two analysed periods. Each Excel contained around 1.200-1.600 rows, as one second of wristband measurement generated four data points on average, and the entire tracking duration of each subject ranged approximately 5-7 minutes. Note that, for each participant, the exact timing of both the emotion-induced period start and emotion-induced period end were written down to ease the subsequent differentiation between baseline and emotional period. Specifically, this process began with matching each $\frac{1}{4}$ of second of the total duration of the tracking to the related EDA score. Thereafter, the four EDA data points associated with the exact minute during which the video clip started were marked as threshold between *baseline* and *emotional* periods. An extract of the analysis can be seen in Table 2.

Although this initial analysis provided a fairly general overview of the EDA measurements of the two periods, it was deemed essential to clean the data from noise. According to previous research, the quality of EDA signals is extremely sensitive to pressure, body movements and external environmental distractions – all factors that undermine the reliability of the results (Taylor, Jaques, Chen, Fedor, Sano, & Picard, 2015). In this regard, the same authors developed an algorithm-software based that automatically categorises the signals of electrodermal activity and detects on a 5-second epoch basis the threatening signals, which can be removed with an accuracy of 95% (Taylor et al., 2015). The online version of the software EDA Explorer was used to identify such signals and clean the raw data of the 22 participants by performing an automatic artefact detection and removal.

EDA	Tracking Time
1.512042	14:04:18,750
1.517166	14:04:19,000
1.515885	14:04:19,250
1.528695	14:04:19,500
1.535100	14:04:19,750
1.546629	14:04:20,000
1.553034	14:04:20,250
1.562001	14:04:20,500
1.563282	14:04:20,750
1.562001	14:04:21,000
1.564564	14:04:21,250
1.554315	14:04:21,500
1.555596	14:04:21,750
1.554315	14:04:22,000
1.560720	14:04:22,250
1.567126	14:04:22,500
1.585060	14:04:22,750
1.582498	14:04:23,000
1.583779	14:04:23,250
1.582498	14:04:23,500
1.574812	14:04:23,750
1.569688	14:04:24,000

Table 2. Extract of the Threshold Analysis between the two EDA Periods

Once the data were cleaned from noise and re-imported into a new Excel dataset, the mean EDA for both baseline and emotional induced period during the movie-clip were calculated separately for each participant. Specifically, for each cleaned EDA data point, the remaining 0.25 sec-by-0.25 sec values were used to compute each subject’s averages (Gross, Fredrickson, & Levenson, 1994). In this regard, previous literature proposed to analyse EDA signals in different ways based on the need and final objective of the paper. With respect to the thesis project, the applied method was the one followed by Horstick, Siebers and Backhaus (2018), who accounted for relative analysis of changes in EDA through the comparison between baseline measurements and emotional situations. This consisted in making a comparison between the EDA fluctuations during the rest period and the stimulus phase, i.e., after the participant was exposed to the sad video clip (Horstick et al., 2018). For this reason, As shown in Table 3, all participants except one (ID = 14) resulted in a higher EDA in the emotion-induced period compared to the EDA in their baseline.

ID	Group	EDA Baseline	EDA Emotional	EDA Change
1	Treatment	1.22908740	1.78078460	0.55169720
2	Control	1.79854957	1.82836639	0.02981682
3	Control	0.91647549	0.96873784	0.05226235
4	Control	0.16144876	0.22830422	0.06685546
5	Control	0.38508760	0.38806119	0.00297359
6	Treatment	0.05416211	0.07727591	0.02311380
7	Treatment	3.46787419	4.56780999	1.09993580
8	Treatment	0.69519541	0.70303658	0.00784117
9	Treatment	0.15701034	0.18144082	0.02443048
10	Control	3.28807882	4.26685051	0.97877169
11	Control	1.10558793	1.61247738	0.50688945
12	Control	0.16732648	0.17524901	0.00792253
13	Treatment	3.89031533	3.93236639	0.04205106
14	Control	2.21318452	1.05747976	-1.15570476
15	Control	0.48993403	0.49850612	0.00857209
16	Control	0.48575871	0.49340552	0.00764681
17	Treatment	9.03627078	19.16364140	10.12737062
18	Treatment	0.04390891	0.11225616	0.06834725
19	Treatment	1.87183759	2.38101619	0.50917860
20	Treatment	2.74916939	4.06676109	1.31759170
21	Treatment	0.66283584	1.13619407	0.47335823
22	Control	0.51227945	0.59432005	0.08204060

Table 3. Mean EDA Baseline, Mean EDA Emotional, and EDA Change for Participant

In line with the definition of retail therapy as a behaviour triggered in response to an emotional state of sadness, the EDA results of participant 14 were therefore excluded from this point onwards, as all the consequent decision-making processes would have accounted for different consumption behaviours. For the same reason, the participant’s answer to the PPR survey was explicitly identified and not considered in the subsequent analysis.

Since the interest of the study is to check for the overall manipulation of emotional input rather than conducting an in-between participants analysis, the mean EDAs of the remaining 21 subjects were finally aggregated into a dataset, which acted as a starting point for the subsequent statistical analysis (Appendix D). This was performed in RStudio and involved a Wilcoxon-Mann Whitney non-parametric statistical test to validate if the difference between the rest period and stimulus phase was statistically significant. Such a comparison aimed to verify whether participants’ EDA raised during the emotional manipulation, thereby confirming the presence of an emotional state alteration.

4.8.2 *PPR survey data analysis*

While the first survey only had the control purpose to confirm that the participants experienced an emotional baseline of sadness, the second survey represented the key measurement to test the hypotheses. Therefore, its analysis is the primary source to answer the research question outlined in the current thesis project.

As aforementioned, the answers to the PPR survey of two participants were excluded due to (1) contaminated measurement of EDA and (2) lack of emotional alteration between baseline and emotional periods. In addition, during the shopping activity, a third participant decided not to proceed with the purchase and keep the money instead (Step III). Therefore, the PPR survey entailed a total of 20 respondents. The entire set of answers is exhibited in Appendix E.

However, to specifically analyse each sub-dimension of PPR proposed by Lee and Cotte (2009), and thereby testing the four sub-hypotheses outlined, an aggregate variable for each of the four PPR type was created. For example, for the theoretical construct of PPRTypel – measured by PPRTypel_a, PPRTypel_b, PPRTypel_c, and PPRTypel_d – the average of these 4 items was calculated as a new variable. This procedure was repeated for the other three types of PPR, therefore obtaining a final new dataset, shown in Appendix F. For the inferential statistical analysis of the data, a series of Wilcoxon-Mann Whitney non-parametric statistical test for independent samples was conducted on RStudio. The permissible probability of error was set at 5 %.

5. Results

The following chapter presents the study findings gathered throughout the experimental session and the surveys. In detail, these are separated into three different sections: the first paragraph entails a descriptive analysis showcasing the results for the creation of an emotional baseline of sadness. Secondly, the statistical analysis results from the PPR survey are thoroughly outlined to test the thesis research hypotheses. Lastly, the third section involves a follow-up test on two deriving assumptions – here, collected data and related results are hence examined.

5.1 EDA results

The mean EDA of baseline and emotional periods of 21 out of 23 participants comprised the data (Appendix D). As the first step, the reliability of the dataset was checked to ensure consistent findings (Saunders et al., 2009). This was conducted both with Cronbach's alpha ($\alpha = 0.88$) and composed reliability ($CR = 0.98$). The analysis confirmed very high reliability of the model, thereby assuming that the study measures did vary together. Subsequently, the statistical power was calculated for the two periods of time with the power analysis of Wilcoxon Mann-Whitney, using the simulation method proposed by Al-Sundugchi (1990). The result of 5.08% suggested that the lack of significant association might be due to the small size of the sample.

Means, standard deviations, medians and interquartile ranges were then computed, as illustrated in Table 4. Precisely, values have been calculated both for the overall results and by distinguishing between treatment and control groups. In addition, the change in EDA was considered and computed. In this regard, at first glance, the results presented in Table 4 showcased a substantial difference in the amplitude of the EDA change between the treatment and control groups, where the values of the former are higher than the latter's ones. However, the high variation in EDA data between the two binary variables represented a threat in obtaining a reliable comparison. Therefore, safer measurements concerning the differentiation of sadness level among treatment and control were conducted. These are later displayed in Table 5, where results from the mood manipulation check are outlined.

	Mean			Sd			Median			IQR		
	All	T	C	All	T	C	All	T	C	All	T	C
EDA Baseline	1.579	2.169	0.931	2.086	2.656	0.965	0.695	1.229	0.501	0.385	0.409	0.410
EDA Emotional	2.341	3.468	1.105	4.135	5.466	1.245	0.969	1.781	0.546	0.388	0.442	0.414
EDA Change	0.761	1.295	0.174	2.184	2.964	0.321	0.067	0.473	0.041	0.023	0.033	0.008

Table 4. Mean, Sd, Median, and IQR Values between the Two Periods

The general difference between the two periods of time was also visualised with a boxplot (Figure 14).

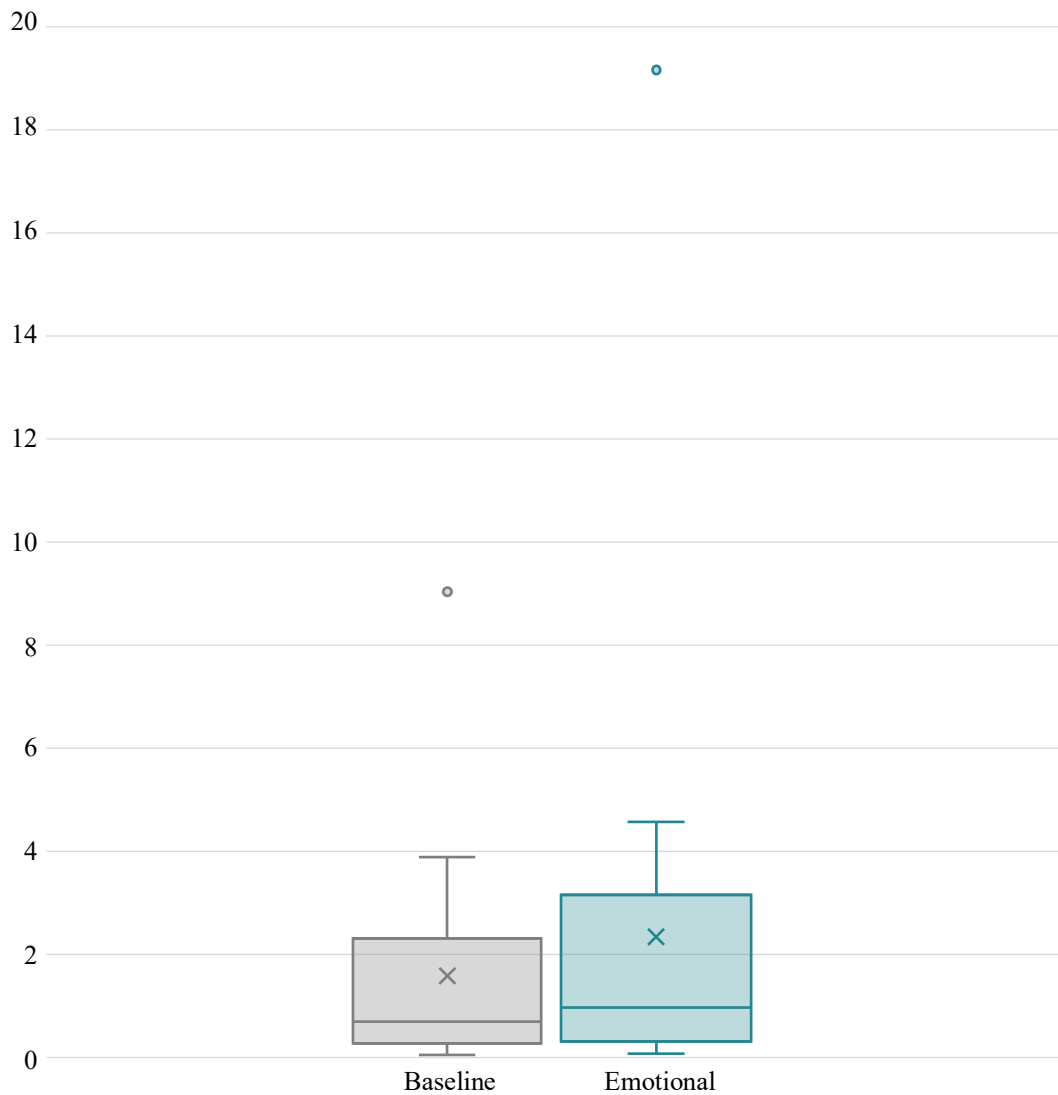


Figure 14. Graphical Difference of EDA between the Two Periods

To statistically validate the difference between the two periods, a non-parametric test of Wilcoxon Mann-Whitney was run since the data appeared not to follow a normal distribution ($p\text{-value}_{Baseline} = 2.93e-05$, $p\text{-value}_{Emotional} = 3.61e-07$). Results showed a p-value lower than α , confirming a statistically significant difference between baseline and emotion-induced period ($p\text{-value} = 4.79e-07$). Hence, 21 participants were emotionally altered while watching the video clip as the statistical analysis proved that the two EDA periods differed from each other.

To further control that the video clip triggered a sad emotional state, the subjects' answers to the mood manipulation survey were examined. The analysed data suggested that the elicitation procedure was successful. As indicated in Table 5, all 21 individuals – regardless of being either aware or unaware – reported on average a remarkably greater level of sadness than any other emotion¹. In addition, as anticipated earlier in this section, the manipulation check results also showcased that both treatment and control groups reported an almost equal amount of sadness ($M_{Treatment} = 4.18$; $M_{Group} = 4.10$).

Emotion	Mean	Sd	Mean	Sd	Mean	Sd
	General		Treatment		Control	
Anger	1.38	0.865	1.09	0.302	1.70	1.160
Anxiety	2.48	1.50	2.73	1.489	2.20	1.549
Boredom	1.57	0.926	1.18	0.405	2.00	1.55
Disgust	1.00	0.00	1.00	0.00	1.00	0.00
Fear	1.95	1.28	2.27	1.421	1.60	1.075
Indifference	1.62	0.973	1.09	0.302	2.20	1.135
Sadness	4.14	1.06	4.18	1.250	4.10	0.876

Table 5. Mean and Sd Values for Mood Manipulation Survey

¹ Note that the non-parametric alternative test of Kruskal-Wallis and related pairwise comparisons using Wilcoxon rank sum test were used as the assumption of normality was not satisfied ($p\text{-value} = 1.845e-15$). Statistical tests revealed the general mean values of each emotion differed from mean value of sadness at $p < 0.05$ (Sadness-Anger = $8.2e-07$; Sadness-Anxiety = 0.0017 ; Sadness-Boredom = $2.5e-06$; Sadness-Disgust = $4.7e-08$; Sadness-Fear = $2.4e-05$; Sadness-Indifference = $2.5e-06$).

5.2 PPR survey results

Among the 21 sad participants exposed to the choice of either (1) purchasing a product from the website or (2) bringing the full amount of money home, everyone apart from one decided to complete the shopping activity. Since the data collected from the EDA measure and the manipulation survey confirmed that all subjects were sad, it was initially assumed that the consumption activity in which the participants engaged was of impulsive nature, namely retail therapy. Yet, to further comply with what established by the literature, answers to the question “*To what extent did buying the product make you feel better while doing the experiment?*” were checked. Overall results supported the validation of the assumption ($M = 4.20$; $sd = 0.62$). Individual responses are shown in Appendix G.

Concerning the scale aimed at measuring the level of PPR, a principal component factor analysis was initially conducted to evaluate the measurement of each new aggregated variable. Validity and reliability were then checked to validate the measurement scale. All constructs’ average variances extracted (AVE) were higher than 0.50, ensuring validity (Fornell & Larcker, 1981). In addition, reliability with Cronbach’s alpha ranged from 0.84 to 0.98, confirming high internal consistency of the model as the coefficients exceeded the minimum accepted value of 0.60 (Malhotra, 2007). Finally, composite reliability exceeded the suggested level of 0.70 in each study variable (Fornell & Larcker, 1981), which also implied that the measures varied together. The results are depicted in Table 6.

Constructs	PPR Survey Scale Items (Lee & Cotte, 2009)	α	CR	AVE
PPRType1: Due to Forgone Alternatives	PPRType1a: I should have chosen something else than the one I bought. PPRType1b: I regret the product choice that I made. PPRType1c: I now realize how much better my other choices were. PPRType1d: If I were to go back in time, I would choose something different to buy.	0.976	0.980	0.924
PPRType2: Due to Change in Significance	PPRType2a: I regret getting the product because it was not as important to me [...] PPRType2b: I wish I hadn’t bought the product because it is now useless to me. PPRType2c: I regret my purchase because the product never served its purpose. PPRType2d: I regret my purchase because I did not need the product.	0.838	0.869	0.642
PPRType3: Due to Under- Consideration	PPRType3a: With more information, I feel that I could have made a better decision. PPRType3b: I feel that I did not put enough consideration into buying the product. PPRType3c: With more effort, I feel that I could have made a better decision. PPRType3d: I regret not putting enough thought into my decision.	0.909	0.915	0.731
PPRType4: Due to Over- Consideration	PPRType4a: I expended too much effort in making my decision. PPRType4b: I wasted too much time in making my decision. PPRType4c: I think I put too much thought in the buying process. PPRType4d: I feel that too much time was invested in getting this product.	0.836	0.855	0.608

Table 6. Validity and Reliability Analysis of Constructs

Due to the commonality of statistical errors, the assumption of normality was then considered to provide a basis for credible statistical analysis to filter out skew and kurtosis (Braithwaite et al., 2015). Normalisation of each construct was checked both through visual inspections (Table 7) and the Shapiro-Wilk's normality test. The latter indicated that only two of the four aggregate variables were normally distributed ($p\text{-value}_{PPRType1} = 1.98e-4$, $p\text{-value}_{PPRType2} = 0.03$, $p\text{-value}_{PPRType3} = 0.09$, $p\text{-value}_{PPRType4} = 0.09$), advocating for a non-parametric statistical analysis for the hypotheses testing.

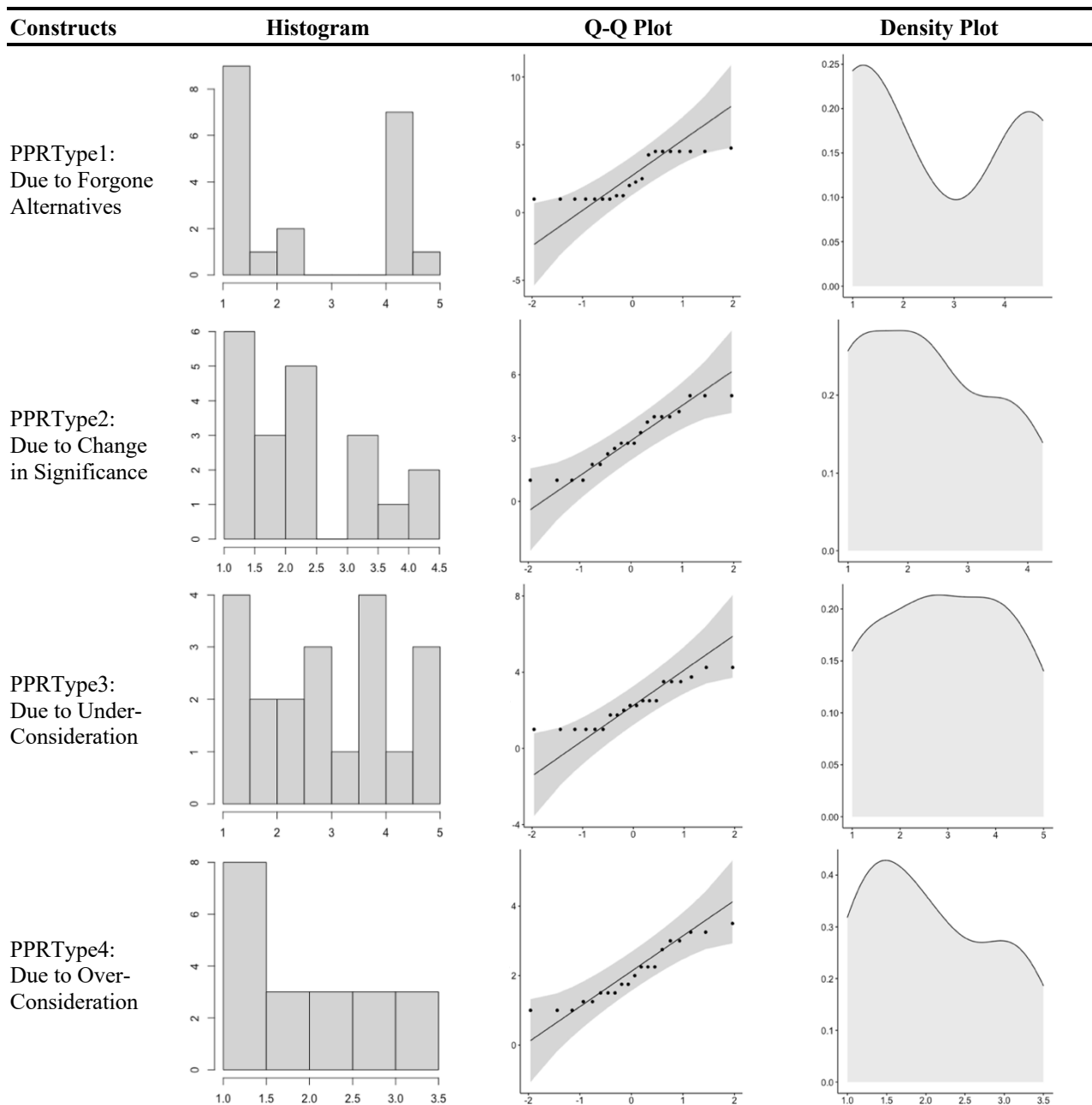


Table 7. Visual Inspection of Distribution of Constructs

Subsequently, means, standard deviations, medians and interquartile ranges of the four aggregate PPR types were calculated. In particular, data in each construct were differentiated based on the factor awareness, i.e., distinguishing between treatment and control groups. Results are shown in Table 8. Moreover, the statistical power was again conducted with the Wilcoxon Mann-Whitney power analysis (Al-Sunduqchi, 1990). The results were 4.4% for PPRTypel, 4.47% for PPRTypel2, 4.23% for PPRTypel3, and 4.33% for PPRTypel4, implying that the lack of significant association with the four variables might be due to their small sample size.

Constructs	Mean		Sd		Median		IQR	
	T	C	T	C	T	C	T	C
PPRTypel: Due to Forgone Alternatives	1.65	3.58	1.07	1.57	1.12	4.5	1	1.88
PPRTypel2: Due to Change in Significance	1.82	2.8	0.842	1.24	1.88	3	1.25	1.75
PPRTypel3: Due to Under- Consideration	2.15	3.72	0.994	1.33	2.12	4	1.56	1.75
PPRTypel4: Due to Over- Consideration	1.95	2.15	0.956	0.719	1.75	2	1.56	1.25

Table 8. Mean, Sd, Median, and IQR Values of Constructs for Groups

In order to easily visualise if the level of PPR was lower in the treatment group, each construct data was depicted with boxplots (Figures 15, 16, 17, and 18). All graphs reflected a difference in PPR between the two binary variables.

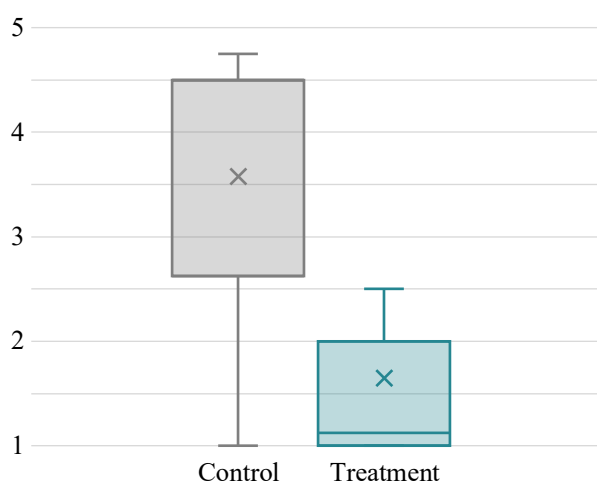


Figure 15. Graphical Difference of PPRTypel

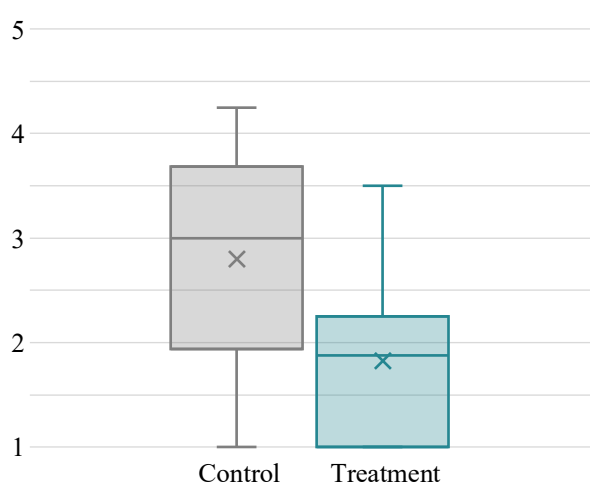


Figure 16. Graphical Difference of PPRTypel2

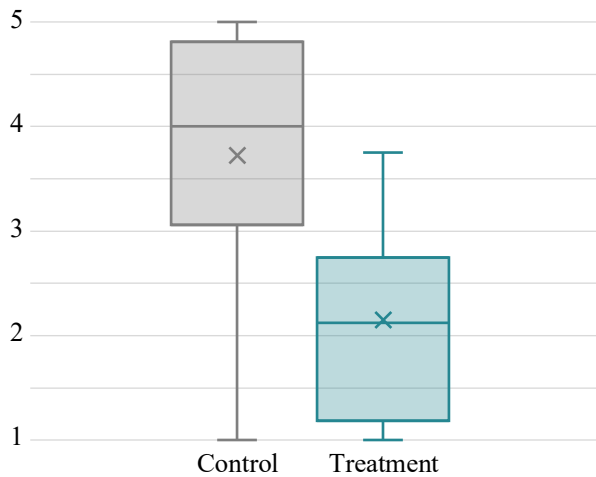


Figure 17. Graphical Difference of PPRType3

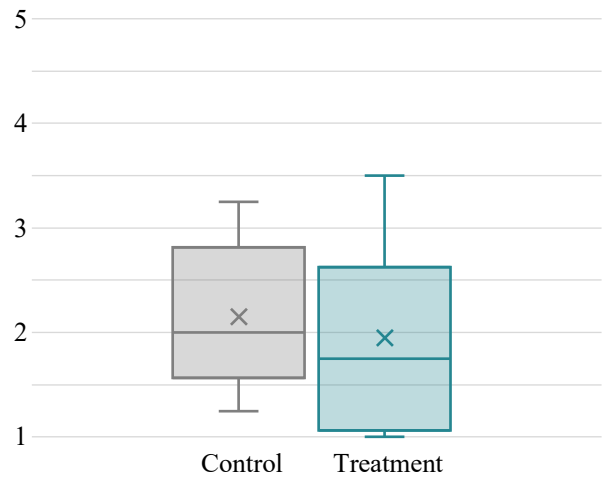


Figure 18. Graphical Difference of PPRType4

To statistically validate the visual results, the Wilcoxon Mann-Whitney signed-rank test was used as non-parametric test for the two dependent samples. Results revealed that the difference in the amount of regret that sad participants experienced when aware versus when not aware was statistically significant in three out of four types of PPR hypothesised. Specifically, being aware of one’s emotional state directly and significantly affected PPR due to forgone alternatives ($p\text{-value}_{PPR\text{Type}1} = 6.79\text{e-}3$), PPR due to change in significance ($p\text{-value}_{PPR\text{Type}2} = 0.03$), and PPR due to under-consideration ($p\text{-value}_{PPR\text{Type}3} = 5.93\text{e-}3$), thereby supporting H1a, H1b, and H1c, respectively. Nevertheless, awareness did not affect PPR due to over-consideration; therefore, H1d was rejected ($p\text{-value}_{PPR\text{Type}4} = 0.24$). Thus, only PPR of Type 1, 2 and 3 were influenced by being aware of one’s altered emotional state.

Finally, the question “*To what extent did you think about your EDA and emotional alterations during your purchasing decision?*” was considered to ultimately confirm the authenticity of the findings. Indeed, the answers to the question explicitly acted as a manipulation check for the rise in cognitive abilities and the activation of the reflective system (S2). A mean result of 3.00 indicated that a fair level of reflectiveness was experienced – on average – by the totality of the treatment group. Results for each individual are available in Appendix H.

5.3 Follow-up test on products

Findings from chapter 5.1 revealed that the treatment group experienced a statistically significant diminished PPR than the control one. Hence, the hypothesis that being aware of one's emotional state decreases the chances to encounter PPR was confirmed. Although this investigation was exhaustive, a further question emerged regarding the core reasons why the treatment group, once made aware, experienced less regret. Specifically, two contrasting explanations were pointed out:

- a. The participants who were previously made aware experienced less regret because they changed their purchased product in favour of a more valuable one; or
- b. The participants who were previously made aware experienced less regret because they changed the way they felt about their decision later on, i.e., they convinced themselves about the worth of their purchased good.

In the interest of gaining valuable understanding on this matter, the factor value was considered a discriminant variable to test the first assumption (a) and thereby accept or reject the second one (b). To this purpose, a further survey – composed of one central question and developed in the form of a rating scale – was designed on Qualtrics and diffused across social media platforms, i.e., LinkedIn, Facebook and WhatsApp. The respondents were asked to attribute a value from a minimum of DKK 0 to a maximum of DKK 100 to three products, randomly selected among the categories of (1) products purchased by the treatment group, (2) products purchased by the control group and (3) unpicked products. Note that the maximum value of the scale (DKK 100) corresponded to the price of each product exposed on the website. Appendix I displays an example of a randomised survey.

In this regard, few aspects were taken into account while developing the questionnaire to collect reliable answers. Firstly, the range of items offered on the website comprised both neutral gender items and products specifically addressed either to women or men. Hence, a distinction between genders (*female*, *male*, and *prefer not to say*) was included, meaning that each respondent received a customised survey according to the gender option selected.

Also, for the sake of the validity of responses, the survey required different value attribution for each item, implying that respondents were not allowed to give the same answer when evaluating the three products. Moreover, only Denmark-based individuals were invited to fill out the survey – as the items under study involved a range of Danish brands products that were likely to be unknown on an international scale. Finally, the 23 participants of the experiments were asked not to complete the questionnaire, as they indirectly provided their opinion about the products when engaging in the purchasing activity (Step III).

5.3.1 Follow up survey: Data analysis and results

Also in this case, RStudio was used to conduct the statistical analysis of the survey. In particular, an analysis of variance (ANOVA) was considered necessary to test the assumptions mentioned above. First of all, since a one-way ANOVA is generally considered to be reasonably robust against violations of the normality assumption, as long as the sample sizes are sufficiently large, the dataset was considered in line with the sample size law ($N = 399$). Furthermore, since the ANOVA test requires the variance across groups to be homogeneous, Bartlett's test ($p\text{-value} = 0.95$) and Levene's test were computed ($p\text{-value} = 0.80$) to check for homogeneity. In both cases, the p-value was not less than the significance level, implying that there is no evidence to suggest that the variance across groups is statistically significantly different. Therefore, homogeneity of variances in the different groups was assumed. Finally, ANOVA required that the observations in each group are independent. Since the survey collected the data through a randomised process, this aspect was sufficient to fulfil the condition.

Subsequently, means, standard deviation, and statistical power were calculated – where the results obtained from the power analysis indicated a strong power (99.99%). Moreover, the boxplots helped visually detect the differences among the three groups. As depicted in Figure 19, 1 stands for products selected by the treatment group; 2 refers to the products chosen by the control group; and 3 relates to the category of unpicked products. Then, the one-way ANOVA statistical test was run to determine if these were statistically significant. The p-value resulted $< \alpha$, thereby concluding that significant differences exist between the three groups ($p\text{-value} = 0.028$). To further ensure the robustness of the results, the equivalent non-parametric test (Kruskal-Wallis) was performed. Also in this case, results were valid ($p\text{-value} = 0.033$).

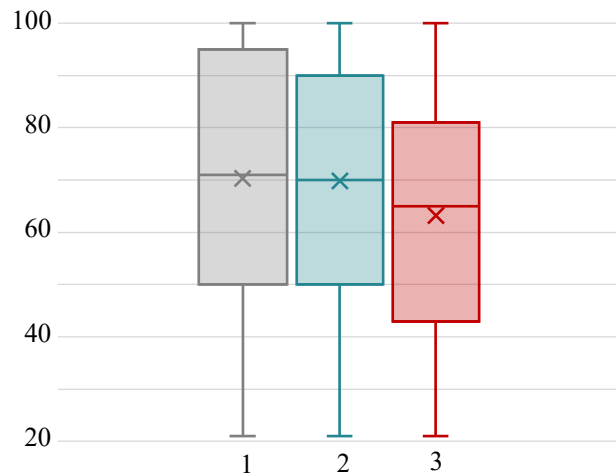


Figure 19. Graphical Difference of Value between Products Categories

However, the outputs of both statistical tests did not reveal which pairs of groups were different. Thus, few pairwise tests were implemented in ANOVA and Kruskal-Wallis (pairwise t-test and Wilcoxon, respectively) to calculate a two-by-two comparison between group levels. Results revealed that statistically significant mean differences were present only between groups 1 and 3, and 2 and 3 ($p\text{-value}_{\text{pairwise t-test}} = 0.037$, $p\text{-value}_{\text{pairwise Wilcoxon}} = 0.048$), inferring that the value of products unpicked (3) was the lowest and statistically different from the products selected by the participants.

However, it was deemed useful to additionally investigate the difference between these two categories (products picked by the treatment versus picked by the control group), also because the mean and standard deviation of the former ($M_{\text{Treatment}} = 70.28$, $sd_{\text{Treatment}} = 24.2$) were higher than the mean and standard deviation of the latter ($M_{\text{Control}} = 69.86$, $sd_{\text{Control}} = 23.6$). Thus, a further statistical analysis was computed, specifically a Wilcoxon test. Once again, results confirmed that no statistically significant difference existed among the two groups ($p\text{-value} = 0.427$), thereby suggesting that the value of products selected by the treatment group during the experiment did not statistically differ from those selected by the control.

No backing was provided for the first assumption (explanation *a*). In other words, support for the fact that aware people experienced less PPR due to a more reflective decision in terms of product choice was not found. Therefore, explanation *b* represents more plausible reasoning to justify why the treatment group, once made aware, experienced a diminished level of PPR.

6. Discussion

The following chapter intends to present a summary of the thesis findings elucidated in light of existing theories, along with the project contributions to research. Thereafter, implications for practice are presented under a triple perspective, i.e., marketers, consumers, and industry. The final section concludes with a discussion on the limitations encountered during the development of the study, as well as suggestions for future research.

6.1 Summary of the study

The current study conducted a comprehensive investigation on impulse buying behaviour in order to embody a practical solution to diminish the level of PPR arising in sad consumers after retail therapy. Extensive knowledge of previous research within the field was required, delineating the key concepts, theories and models necessary for answering the proposed research question: *By making them consciously more reflective of their altered emotional state, can emotion-sensing technology decrease the feeling of post-purchase regret arising in sad consumers after retail therapy?*

As explained throughout the paper, the literature affirmed that consumers engage in such an impulsive consumption as an effective method to mitigate a negative emotional state, especially sadness (Atalay & Meloy, 2011; Luomala, 2002). In this regard, the initial results of the study agreed with the literature review, therefore setting the stage for the continuation of the project and the hypotheses testing. More specifically, findings from the EDA analysis showed that all the subjects who chose to purchase a product experienced a baseline of sadness. Additional confirmation was obtained through a mood manipulation check establishing that the induced emotional stimulus led the participants to embrace a sad emotional state.

Moreover, theories on retail therapy suggested that the success of this type of consumption lies in the possibility for consumers to choose whether and what to purchase, which provides the individuals with a previously lost sense of control that contributes to ameliorate their negative emotion (Rick et al., 2014). In conformity with extant research on the field, the current thesis project revealed that all sad participants who engaged in the shopping activity subsequently affirmed that their emotional state improved with the purchase.

Finally, previous investigations on the topic enlightened the association of impulsive consumption with the feeling of post-purchase regret (PPR) (Lisjak et al., 2015; Saleh, 2012). Accordingly, the present study reported that once emotionally altered and after engaging in retail therapy, subjects tended to experience PPR. The next section presents in detail the preeminent findings and related contributions to the existing research. In particular, these not only touch upon the thesis project hypotheses yet provides additional insights on the field of PPR related to impulse buying behaviour.

6.2 Contributions

As formerly anticipated, literature asserted that PPR is a harmful consequence of retail therapy. In this regard, previous research did not suggest any solution to prevent PPR associated with impulsive consumption, rather it focused on avoiding consumers to engage in impulse buying behaviour in the first place. However, these strategies require the individual's inner ability to become aware of his or her emotional state. Considering the lack of cognitive awareness characterising impulsive purchases (Cohen et al., 2008; Strack et al., 2006), the present study suggested using EST to raise cognition in consumers and consequently decrease the chance to experience PPR.

Main findings revealed that a number of sad individuals experienced PPR, in support of the extant literature. However, a significantly lower level of regret was found in the aware subjects, therefore anticipating the first contribution of the thesis project. Specifically, this calls for the importance of factor awareness in diminishing the magnitude of PPR arising after retail therapy in sad consumers. In particular, in compliance with the RIM model, findings confirmed that being aware of one's altered emotional state drives people to become more reflective about their decision-making activity, hence reducing the likelihood of PPR to occur.

At the same time, since people were made aware through the use of EST, a second key contribution relates to the role of these instruments as supporting tools for sad consumers to increase their level of awareness. In this regard, the current study added crucial insights to previous research about the efficacy of the technology in raising the cognitive abilities of sad consumers, whose reasoning is instead processed fast and automatically while shopping impulsively. In other words, the EST introduction enabled a shift in consumers from the impulsive (S1) to the reflective (S2) system of processing, in turn diminishing the feeling of regret arising from the impulsive consumption activity.

Thanks to the late advancement in wearable sensor technologies, the emotion recognition field has raised interest in numerous industries, ranging from movies, advertisement and human-computer interfaces (Zhao, Adib, & Katabi, 2016). Yet, to the best of the researchers' knowledge, no study has been conducted so far with respect to the application of EST in the context of impulsive consumption. The current research thus uncovers a third major contribution in relation to the EST role within the sphere of impulse buying behaviour. In line with the central hypothesis, the study proposes EST as a solution to diminish the level of PPR arising as a consequence of retail therapy and related negative emotion (i.e., sadness). Specifically, the use of the technology through wearable devices would encourage a rise in awareness and lead sad consumers to make more reflective choices during their purchasing activities, thereby decreasing – if not preventing – their subsequent feeling of PPR.

On a different note, while observing the unaware subjects, findings provided new understandings of the type of PPR that an impulse buying behaviour encompasses. Firstly, PPR arising after retail therapy is of both outcome and process nature (Lee & Cotte, 2009). Indeed, on the one hand, a sad emotional state implied that consumers were more inclined to experience regret due to a missed product alternative or a diminished product utility – entailing the outcome sphere. On the other hand, scarce information and a short time employed in the decision caused people to feel bad about their purchase, thereby accounting for regret of process nature. Therefore, aligned with Lee and Cotte (2009) conceptual framework of PPR, a fourth contribution of the study sustains that the regret associated with impulsive consumption falls into the three subdimensions of (1) forgone alternative, (2) change in significance and (3) under-consideration.

Secondly, a related contribution involves the fourth and last dimension of the PPR model, i.e., regret due to over-consideration (Lee & Cotte, 2009). In particular, results suggested that this specific type of PPR may not represent a case of regret subsequent to retail therapy. A potential explanation for this lies in the RIM theory, which suggested that impulse buying is characterised by extremely low, if not absent, levels of reflectiveness (Strack et al., 2006). Since the urge of buying in itself does not include over considering the decision, the likelihood of experiencing the regret of Type 4 after retail therapy is rare. In other words, the fifth contribution is thus backed up by the study findings revealing the scarcity rather than the excess of evaluation during the impulsive purchasing act.

Results also contributed to a clearer understanding of the underlying reasons why people made aware of their altered emotional state experienced a diminished level of PPR. Although secondary data were not collected on the specific topic, the final outcomes of the follow-up survey allowed few speculations, which further broaden the research field within impulse buying behaviour and related PPR. In particular, despite the awareness state, participants made a choice that was generally considered valuable. Hence, since the value of a product did not reveal to be a differential factor between aware and unaware subjects, it cannot be concluded that once made aware of their negative emotion, sad individuals opted to purchase a more valuable product. Conversely, it can be speculated that being aware of one's altered emotional state leads consumers to gradually embrace positive attitudes towards the selected product. Thus, a sixth contribution entails further insights into the impact of factor awareness on impulsive decision-making activities. Put differently, aware consumers do not necessarily shift towards a more valuable product choice; rather they change how they later feel about their purchase. Therefore, buying a product that people slowly convince themselves about diminishes the chances for PPR to occur in the first place.

Moreover, the study enabled further speculation concerning the field of retail therapy. Specifically, the impulsivity characterising this type of consumption does not entail the purchase of non-valuable products. This means that, regardless of how much a subject is unreflective during his or her decision-making activity, the value of the item purchased does not interfere. This can thus be intended as a seventh contribution to existing literature, as it adds new understandings to the nature of the retail therapy activity.

Lastly, in relation to the above discussion, the current study contributes to the extant research by suggesting that the major problem of retail therapy is not related to the purchase itself but to the feeling arising in people after they engaged in the impulsive activity. Specifically, the eighth and final contribution suggests that the PPR associated with impulse buying behaviour is not a consequence of purchasing a less valuable product. In contrast, as previously affirmed by literature, PPR may be the effect of realising that the purchase has been conducted in an irrational way, thereby leading consumers to be dissatisfied about their wisdom throughout their purchasing decision-making process (Saleh, 2012).

6.3 Implications for practice

Nowadays, the emerging field of emotion-sensing technology (EST) has acquired significant relevance for a variety of usages in disparate areas (Shu, Chiu, & Hui, 2019). Indeed, detecting human emotions can bring a number of benefits in several industries, such as neuromarketing, health, education, and so on (Lim et al., 2020). As a natural consequence, a rising trend has followed in relation to the development of systems able to recognise, infer and react to user's emotional states (Lim et al., 2020; Zhao et al., 2016).

With respect to the current thesis project, emotions have been shown to play a significant role in consumer behaviour by shaping the process mechanisms underlying all decision-making activities. Since emotions entail several nonverbal cues, their detection may bring a number of benefits to marketing practitioners, who aim to understand their customers' behaviour to better fulfil and respond to their needs (Lim et al., 2020). At the same time, emotion-sensing has attracted attention not only from marketers but also from the public (Wang, Ho, & Cambria, 2020) and the industry accounting for its application, i.e., the consumer electronics industry (Kołakowska, Szwoch, & Szwoch, 2020).

Hence, the ensuing paragraph discusses the implications of the presented thesis project, touching upon the three mentioned playing actors. Specifically, implications for marketing practices are first considered. Secondly, the consequences for consumers are addressed. Lastly, the section sheds light on the involvement of the consumer electronics industry in the field of EST as a solution to PPR.

6.3.1 *Implications for marketers*

The first and major field of EST application addresses the marketing domain, which represents the underpinning motivation to the current thesis project. In this regard, it has already been acknowledged that consumers' needs and associated values to brands are critical factors for marketers and businesses in general. As a matter of fact, companies are eager to understand their customers' behaviours with the final aim to raise market share (Wang et al., 2020). In light of what presented in the study, the use of emotion detection technology could bring significant changes in the field of impulse buying behaviour (Silvera et al., 2008), leading to substantial implications for marketers.

First of all, section 2.5.2 outlined the consequences caused by PPR, clearly resulting in significant downsides for the firms, which have to deal with disappointed customers willing to switch brands due to regretted experiences (Tsiros & Mittal, 2000). In this regard, research in consumer behaviour has demonstrated that when consumers purchase products that they later regret entails a number of costs, which are everything but favourable to marketers (Saleh, 2012). These mainly involve a low level in consumer satisfaction (Inman et al., 1998 in Saleh, 2012), which in turn leads to inferior if not absent intent to repurchase. Dissatisfied customers call instead for refund options and – even worse – express higher preferences towards competitors’ alternatives (Tsiros & Mittal, 2000; Bui et al., 2011).

Moreover, a further related issue arising from PPR involves the spread of destructive word of mouth (WOM). Essentially, these instigate the diffusion of a negative brand image (Garcia & Perez, 2011 in Saleh, 2012), which is considered of particular harm for any company’s success. Indeed, the very first step toward creating brand loyalty and trustful relationships with customers is the image a company can build and maintain throughout time (Bui et al., 2011).

Because of the destructive effects of PPR on companies and brands, it is fundamental for marketers to consider the antecedents that lead consumers to later regret their purchase (Saleh, 2012). Through an extensive background review on the field of consumer behaviour, the current research project was able to provide a comprehensive understanding of the factors associated with PPR. In this context, several studies accounted for a direct relationship with an impulse buying tendency (Hoch & Loewenstein, 1991), mostly deriving from an incidental state of sadness (Saleh, 2012).

Although impulsive purchases account for a considerable portion of the retailers’ sales volume (Nicholas, Li, Roslow, Kranendonk, & Mandakovic, 2001 in Saleh, 2012), marketers shall recognise the unfavourable influence of this type of consumption. Indeed, despite increasing sales and profit in the short-term, purchases of impulsive nature might ultimately damage the brands’ image, decrease consumer satisfaction and spread harmful WOM in the long run (Silvera et al., 2008). For this reason, the thesis investigated a solution aimed at partially alleviating the sad consumers’ sense of regret associated with an impulsive purchase. Particularly, this embraced the application of EST as an advantageous intervention in improving consumer experience and subsequently diminishing their level of PPR.

By raising the cognitive abilities and a level of awareness about the individual's emotional alterations and negative affective state, EST would re-establish a sense of reflectiveness on the retail therapy activity. Consequently, this could ultimately impede the feeling of regret towards a brand arising after the impulsive consumption. Hence, the ensuing implications for marketers are multiple – first among others, preventing customers from switching to competitors' options (Saleh, 2012). In turn, this would entail additional advantages, including a strengthened competitive positioning, increased consumers loyalty, and reduced costs associated with product returns (Bui et al., 2011).

Simultaneously, the application of EST would entail an even larger number of opportunities for marketers interested in studying and anticipating consumer behaviour (Sujata et al., 2018). Generally speaking, a key implication of EST within this practice would enable the creation of deeper insights, providing marketers with a better understanding of the consumers association towards a particular product or service (Wang et al., 2020).

In addition, by grasping details on consumers' emotions, marketers could better handle customers' complaints by developing specific and targeted responses (Wang et al., 2020). At the same time, they would immediately learn an individual's reactions towards marketing efforts and advertising strategies (Zhao et al., 2016). Finally, such emerging technologies would allow companies to adopt EST as an effective solution to improve customers' experience (Shu et al., 2019). By detecting their emotional states through the direct use of users' devices, marketers would ameliorate the interactions with customers, thereby enriching the quality of their relationships.

However, marketers are only indirect beneficiaries of the use of EST. This means that implications for marketers arise as long as consumers take advantage of these tools' application. Particularly in the context of impulse buying behaviour, only when consumers experience a diminished level of PPR through the use of EST then marketers will eventually encounter benefits. In other words, providing customers with means that make them aware of their emotional state would reduce the risk for brands to find themselves in the adverse situation of PPR in the very first place.

6.3.2 Implications for consumers

Extant literature revealed that, during their purchasing activity, consumers try to behave rationally in order to achieve maximum utility and satisfaction levels (Saleh, 2012). Nonetheless, literature also backed up on the fact that individuals' resources are limited, and so are their cognitive abilities while making purchasing decisions – which are also very likely to be influenced and affected by several external and internal stimuli. In relation to the current study, particular relevance has been given to the role of emotions, which substantially impacts the rationality of the consumption behaviour. Nowadays, the required effort to behave rationally is further amplified due to the proliferation and easy accessibility to online stores as well as the range of alternative brands available in new markets (Saleh, 2012). These factors require an even higher level of involvement of consumers in their purchasing-decision-making processes, in order to select the best alternative (Shankar, Cherrier, & Canniford, 2006 in Saleh, 2012).

Yet – several factors row against individuals' effort to rationalise the decision-making activity: first among everything, an impulse buying urge. As a consequence, this leads consumers to experience a series of regretful situations. The current research has deeply investigated the facet of PPR arising after an impulsive consumption. In particular, this causes people to feel guilty about their purchases for a variety of reasons, including changing the perceived level of product utility or regretting not putting enough thought into the buying process. Furthermore, individuals often compare their choice with the alternative they decided not to purchase (Loomers & Sugden, 1982; Landman, 1987). Indeed, as demonstrated by the emerging findings and further supported by existing literature, consumers very often feel bad about having ignored the available product alternatives (Saleh, 2012).

This overall process of regret makes people doubtful about the extent to their decisions were correct and triggers a general “state of grief and psychological pain” (Saleh, 2012, p. 106). To solve this feeling of regret, the current research solicited the use of EST as a means to improve consumers' purchasing experience in the context of impulse buying behaviour and associated retail therapy. In particular, under the perspective of an emotional consumer, the application of EST would lead to significant improvements when the individual feels the need to resort to regulatory consumption as a therapeutic means to improve his or her emotional state.

In particular, emotion detection devices able to infer an altered emotional state would make consumers more aware of their negative emotions, thereby increasing their level of reflectiveness on the decision-making process. This would in turn mitigate the possibility of incurring the impulse of buying, implying a more rational choice and decreasing the chances of experience PPR. In this regard, EST entails tangible solutions to confront the typical inconveniences caused by regret associated with impulsiveness.

First of all, in conformity to the literature, PPR affects the consumers' future purchasing behaviours (Lee & Cotte, 2009). As a matter of fact, as argued by the same authors, the feeling of regret negatively affects buyback intentions and indirectly encourage the consumers to switch towards other brands for future purchase opportunities. On this note, the ability of EST to raise awareness and reflectiveness before the consumer engages in an impulsive purchasing activity would (1) increase the quality of the shopping experience and (2) avoid the discomfort for the consumer who, when struggling to find trust in a brand, is forced to keep looking for alternatives.

Lee and Cotte (2009) also argued that PPR heavily affects the personal aspects of the consumer's life. Indeed, it involves significant thoughts of self-judgment and self-blame, thereby questioning the person's decision-making ability and leaving him or her at the mercy of negative emotions (M'Barek & Gharbi, 2012). In order to avoid this long-term feeling of regret, the use of external aids that stimulate reflection and rational thinking in a decision-making process would scale down the human tendency to self-criticise, thereby inciting and maintaining the positive feeling arising after the purchase.

In relation to that, consumers driven by negative emotions engage in retail therapy intending to feel better. However, the impulsiveness that characterises this shopping experience implies that the consequences obtained are the opposite of beneficial (Lisjak et al., 2015). Among others, consumers may think they have wasted time and money on a choice that ironically disrupted the first goal of compensatory consumption, i.e., to restore positive emotions and make people feel better (Lisjak et al., 2015). However, through the use of EST, consumers would engage in a more thoughtful purchase, thus reducing their perception of having lost money on an unwanted purchase.

More broadly, by detecting their emotional state, consumers would also gain knowledge about their physiological cues and how these interact with external stimuli (Zhao et al., 2016), in turn ameliorating their sensitivity towards their internal symptoms. This has benefits in terms of reducing PPR, as well as on a more general psychological sphere impacting consumer behaviour – which entails different mental disorders, such as depression, anxiety, bipolar disorder, and so on. In this context, EST would thus allow a much earlier response to and possibly account for such conditions (Zhao et al., 2016).

However, drawbacks of EST applications in customers' shopping activities exist and are considered a barrier. In particular, the implications for privacy issues fairly challenge the use of emotion detection devices as instruments that can regularly be part of daily consumers' life. Such tools would indeed collect a large amount of personal data from their users, who may be reluctant to provide their private information. Furthermore, due to the limited processing and storage capacity, these instruments mostly rely on cloud platforms where data are uploaded on a regular basis, thereby increasing the risk for users' information to be disclosed (Shu et al., 2019). As a result, individuals are currently called to make a compromise, characterised by a trade-off between the benefits gained from the use of EST in the context of impulsive consumption and the risky chance for their sensitive data to be revealed (Politou, Alepis, & Patsakis, 2017 in Kołakowska et al., 2020). Therefore, the advancement of a uniform privacy protection standard is necessary in order to safely control and monitor the use of personal data through emotion detection devices (Shu et al., 2019).

6.3.3 Implications for the consumer electronics industry

Industry 4.0 is characterised by the eminent progress in the emotion detection market, as the application of these emotion-sensing tools is undeniably generating a huge impact on individuals' experiences and behaviours in both the social and economic spheres (Gallon & McDonald, 2016). As a matter of fact, this industry global market size is expected to grow from 19.5 billion dollars in 2020 to 37.1 billion dollars by 2026, following approximately a compound annual growth rate of 11.3% (Mordor Intelligence, 2019). Such exponential growth opens the doors to countless opportunities – specifically related to the growing demand from companies interested in recognising, interpreting and processing individuals' emotions to better understand consumers and competitors (Wang et al., 2020).

Thus, the field of emotion recognition has witnessed a rising significance in multiple areas, ranging from health to advertisement (Zhao, Adib, & Katabi, 2016). With respect to the current thesis project, key implications are addressed to the sphere of retail therapy, which touches upon both marketers and the consumers – as outlined in the previous sections. Nevertheless, the mere practical implementation of EST is a primary responsibility of neither of these two target groups; instead, it is in the hands of the consumer electronics industry.

In this regard, the ever-growing relationship between the field of emotion recognition and the consumer electronics industry (Fong & Westernik, 2012) is raising particular attention of the latter in inciting the development of these new technologies (Kołakowska, Szwoch, & Szwoch, 2020). As a matter of fact, thanks to the progress in emotion detection systems and algorithms, recent years have seen the advance of a number of affective and emotion-aware sensors, which implies several benefits for the market of consumer electronics (Kołakowska et al., 2020).

When considering the application of emotion detection tools within the consumers' daily activities, implications for the consumer electronics industry first refer to the technology's practical functioning. As described in section 2.6.2, EST entails measurements of physiological nature, mainly operating in two stages: (1) the extraction of the emotion-related signal and (2) the association of the signal with the specifically recognised emotion (Zhao et al., 2016). The current study's proposed solution to the issue of PPR involved the use of GSR as an instrument able to analyse the physiological features of individuals and subsequently make them aware of their emotional state.

To the purpose of detecting human emotional alterations, GSR was considered a robust measure, whose EDA signals are commanded by involuntary activations of the autonomic nervous system and thus beyond human control (Kosonogov et al., 2017). Furthermore, EDA values are rapid to analyse and do not require elevate computational competencies; at the same time, they are deemed to be low-cost and easy to assess (Figner & Murphy, 2011). In addition, since a small number of electrodes to be measured is needed, GSR might be easily included in individuals' daily lives by using wearable devices (Dzedzickis et al., 2020). Specifically, by monitoring the physiological signals that change with the human emotional state, people's emotions would eventually be inferred.

In line with the above, a major implication for the consumer electronics industry relates to the application of EST in wearable devices. In recent years, the wearable sensors technology has acquired a critical role in monitoring physiological signals, thereby attracting the attention of researchers, as well as different business areas and tech giants (Majumder, Mondal, & Deen, 2017). As a result, a variety of wearable commercial products monitoring physiological parameters have been introduced in the marketplace, including wristbands, smartwatches, and headbands (Majumder et al., 2017).

This was further supported by the rising trend deploying personal tools to track users' health (Kołakowska et al., 2020). For instance, a number of instruments enabling the measurement of physiological features are already present in smartwatches, e.g., heart rate (HR) and its variability, blood oxygen saturation, body and ambient temperature, and so on (Kołakowska et al., 2020). Therefore, thanks to the late advancement in the innovative and affordable wearable sensor market, the development of emotion detection tools in these devices would represent a key opportunity for the consumer electronics industry at a relatively low cost.

Since wearables are becoming more comfortable and unobtrusive, implications arise when applied to the sphere of impulse buying behaviour. Indeed, these tools would be particularly appropriate for monitoring consumers' physiological features without interrupting their daily activities (Majumder et al., 2017). Thus, the consumer electronics industry should account for the application of non-invasive wearable devices equipped with GSR, as these would represent viable instruments for the consumers to monitor their emotional state in real-time (Majumder et al., 2017). In this regard, a further implication for the consumer electronics industry entails connecting the physiological signals embedded in these tools to personal user-profile, thereby facilitating individuals to become aware of their moods (Westerink et al., 2008).

Besides wearables, the industry should also account for the EST implementation in smartphones and other mobile devices. As a matter of fact, their applicability is seen of primary relevance due to the role they play in the consumers' daily life (Kołakowska et al., 2020). Furthermore, most mobile devices already have the potential to collect important users' information through sensors, e.g., built-in camera, GPS, accelerometer, and so on (Kołakowska et al., 2020). Consequently, the mobile application of these sensors has been raising particular interest in the sphere of emotion recognition (Kołakowska et al., 2020).

At the same time, implications for the consumer electronics industry in the application of EST within users' devices also entail limitations. Indeed, the major drawback relates to the security of individuals' sensitive information, imposed by governmental regulations on privacy, but also by the consumers themselves. Essentially, this concern is caused by two opposing factors: on the one side, EST requires continuous tracking of users' physiological features, thereby producing large amounts of personal data. On the other side, people highly value their privacy and anonymity (Kołakowska et al., 2020). Consequently, privacy concerns emerge regarding how to acquire and anonymise the users' personal data, as well as how to ensure safety both in their transmission and storing on servers.

Therefore, this barrier may limit and slow down the advancement in the application of EST due to both (1) the uncertainty of individuals who question the privacy of their information and (2) the inability of the very same industry to guarantee the integrity of the individuals' personal data collected (Kotz, Gunter, Kumar, & Welner, 2016). Thus, the consumer electronics industry is called for a deeper effort in investigating methodologies to ensure highly secured acquisition and storage of data (Majumder et al., 2017).

To sum up, implications from the implementation of EST in users' devices exist and essentially concern three main actors, i.e., marketers, consumers and the consumer electronics industry. Although a shared involvement of all the parts is required in order to achieve the beneficial facets of EST within the context of impulse buying behaviour, further consideration is needed. In particular, it is essential to stress out that consumers should understand that the value deriving from the use of these tools is primarily addressed to them. In fact, if individuals perceived the application of EST and related emotion detection for the market gain rather than their own, they could feel manipulated. In turn, this would account for a loss of trust towards (1) the emotion-sensing electronics devices and (2) brands, as the result of the failure of marketers in establishing a long-standing relationship with their customers. This implies that both the consumer electronics industry and marketers would only partially benefit from the use of EST in people's daily shopping activities.

6.4 Limitations and future research

Whenever conducting a study, researchers encounter a number of limitations, which may influence and potentially hinder the generalisation of the results. In the following session, the main drawbacks characterising the current thesis project are presented, starting with the most common constraints associated with experimental design.

In particular, since part of the objective of the thesis entailed a rise in the individuals' level of awareness about their emotional state, the domain of EST played a significant role, which needed to be approached in a well-clarified way. Consequently, it seemed initially reasonable to collaborate with the CBS SenseLab laboratory, as it is equipped with several measurements, primarily aimed at tracking the emotion response to different stimuli. However, the thesis was limited in the way that the research had eventually to be conducted independently, due to Covid-19 restrictions imposing the university's closure for the entire time horizon, in which the study had to be conducted. The proposed solution and related experimental setting thus represented a different alternative to the original one, which however implied supplementary control-tests and assumptions.

In addition, a restrictive monetary budget (100kr each participant) along with the closure of mostly all physical shops in Copenhagen due to the lock-down impositions inferred further difficulties. Among others, these involved the selection of hedonic products to be offered in the fictional website, which mostly included items of beauty routine/skincare, accessories, or sweets. For this reason, future studies should further touch upon the sphere of impulsive consumption, including broader categories of hedonic nature products.

On a different matter, the artificiality of the experimental setting may have led participants to behave unnaturally, thus in a way that does not reflect the real-life situation. Moreover, conducting a constructed experiment entailed the restraints relating to the *demand characteristic*, i.e., the case in which specific experiment requests and activities give participants some clues that lead them to become aware of the study final purpose (Nichols & Maner, 2008). With this respect, the second step of the experiment required participants to watch a video clip that clearly elicited sadness. This particular phase might have raised queries about the experiment purpose and influenced the subjects' behaviour during the subsequent steps of the test, increasing the risk of obtaining biased results.

A further concern of the present study regarded the small sample size and overall representativeness of 23 young individuals, including both students and neo-workers. Although different researchers pinpointed that using a student sample may limit the generalisability of the results, the current thesis project has largely focused on the relationships between different psychological constructs, which are known to be less vulnerable to the issue of generalisation (Silvera et al., 2008). However, in view of the fact that little research has been conducted in this field, future studies may consider replicating a similar experiment with a larger sample represented by older consumers. Furthermore, the current thesis project was not concerned with the demographic aspects of the selected sample. Therefore, future research is encouraged to investigate additional moderators, e.g., gender, nationality, income, etc., in order to observe whether these variables might affect the experiment results and provide additional insights.

Other limitations reflected the issues that come with the EDA measurement. First of all, in the first phase of the experiment, participants were asked to wear the wristband in order to start measuring their baseline level. Here, time played a significant opponent role. In particular, due to time restrictions, this step lasted about 2 to 4 minutes (Braithwaite et al., 2015). Considering the short calibration time – and the fact that the physiological conditions of participants during the day were unknown – the baseline level was simply an estimation of the moment from when the subjects entered the room until the minute the sad video clip was played. Also, the inner characteristics of each individual might have affected the response to a stimulus, therefore limiting the accurate tracking of emotional alteration using physiological measurement (Leiner, Fahr, & Früh, 2012).

Secondly, although EDA can precisely identify the level of arousal related to the skin conductance signals, a significant drawback consists of the lack of information about the quality of the emotion experienced by the participants, i.e., emotional valence. Therefore, it is suggested to implement additional GSR techniques to increase the accuracy of specific emotions recognition and changes related to the arousal level, performing a more detailed analysis (Dzedzickis et al., 2020; Horstick et al., 2018). For instance, future studies could replicate the present findings using machine learning algorithms and more sophisticated EDA detection tools to increase the level of precision of the research and avoid inaccuracies in verifying the emotion induction.

Thirdly, the measurement of EDA signals could involve a limiting condition in terms of how individuals perceive these tools. This might result in a situation in which people perceive no control on gathering their personal physiological data and thus may tend to judge these tools as intimidating, intrusive and not trustworthy (McDuff & Czerwinski, 2018). For this reason, upcoming studies should replicate similar experiments replacing GSR with EST tools that detect a more precise emotional valence (Deshmukh & Jagtap, 2017).

Finally, future studies, preferably cross-sectional, should also elaborate on the reasons why people who have been made aware of their emotional state tend to experience less PPR than unaware. The presented thesis project has tried to shed light on this matter and gathered answers through an online-spread survey. Yet, a more accurate method to conduct the same research may include the measurement of EDA throughout the purchasing activity. Here, observations of the EDA signals could either (1) increase, implying a rise in the altered emotional state that might lead to a less reflective purchase, or (2) decrease, implying a more reflective purchase due to the restored emotional state. Nonetheless, the extant version of Empatica E4 prevented the current study from following the described process. Indeed, as illustrated in Figure 7 (or Step II.3.a of the experimental section), making people conscious of their alterations in the emotional state required the EDA tracking to be stopped, uploaded to the E4 Connect cloud platform, and subsequently shown to the participants. Conversely, continuing the measurement throughout the purchasing activity would have required the Empatica E4 wristband to be reactivated and calibrated, abruptly disrupting the participant from the focus on retail therapy. This might have threatened the efficacy of the experiment: by repeatedly switching off and on the wristband, the participant would have remembered being under observation, thereby resulting in an increased Hawthorne effect (Merrett, 2007).

7. Conclusion

In the course of the paper, impulse buying has been portrayed as an unplanned behaviour followed by positive emotional responses, occurring in reaction to an overwhelming urge to buy (Beatty & Ferrell, 1998; Park & Dhandra, 2017; Strack et al., 2006). Although the urge may have various origins, researchers have identified the consequent retail activity as the interaction between emotional activation and cognitive control. Impulsive consumption and related failure at self-regulating indeed occur as a result of an emotional stimulus and a reduced level of awareness (Weinberg & Gottwald, 1982; Vohs & Faber, 2004; Shen & Khalifa, 2012). Consumers who buy impulsively are not likely to consider the consequences of their purchases or think carefully before making decisions (Park & Dhandra, 2017; Rook, 1987). Instead, they tend to focus on the immediate gratification, as they search for restoration of positive emotions, in the very first place (Rick et al., 2014).

Nowadays, the exponential growth in digital technologies and the proliferation of online stores provide consumers with ever-increasing occasions to buy around the clock (Shen & Khalifa, 2012). Consequently, the immediacy with which individuals can complete a purchase online has intensified consumers' urge to buy impulsively (Strack et al., 2006). This raises the chances to engage in impulsive consumption and resort to retail therapy as a means to enhance one's negative affective state (Vohs & Faber, 2004). Yet, this type of consumption also increases the likelihood for shoppers to regret their purchase decisions, leading to dissatisfaction towards products and companies, negative WOM and image issues that brands are forced to confront themselves with.

Through the theoretical lens of theory, the current research uncovered the interests of PPR arising as the result of an impulse buying behaviour, where factors such as incidental sadness, impulsive system, and lack of cognitive awareness play a distinguishable role. Specifically, connecting these challenges with the emerging development of EST, the present thesis project aimed to apply such instruments as a means to relieve the burden of PPR, which highly weighs on brands. As a result of the experiment conducted, the study added a theoretical but also practical value to the field and provided input to the gap in the current literature. In particular, it revealed that EST has the potential to substantially improve the decision-making process of sad consumers. By making them aware of their altered emotional state at a specific point in time, and thereby increasing their cognitive ability and reflectiveness, EST diminishes the chance of sad people to experience PPR.

While these findings might not be able to guarantee the full defeat of PPR, this study laid the foundation for broader research on the efficacy of the factor awareness on the reduced level of regret. Therefore, it is fair to conclude that EST would help improve the shopping experiences of sad individuals guided by an impulse buying behaviour and, at the same time, lighten the companies' reputation concerns and costs arising from dissatisfied customers. Implications for marketers are plenty, as brands would ultimately benefit from the consumers' improved shopping experience.

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Appendices

Appendix A – Mood Manipulation Survey

We would like to thank you in advance for filling out the following questionnaire. This short survey aims at understanding your general opinions and impressions about the experiment. Please remember that there are no correct or preferred answers, and the questionnaire is anonymous.

***Required field**

How did you like the ambience of the room? *

- Very bad
- Bad
- Neither bad nor good
- Good
- Very good

How did you experience the following items (1 = very bad; 5 = very good)? *

	1	2	3	4	5
Chair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Screen brightness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wristband	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Room lighting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Room temperature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How did you like the products selection offered in the HED online store? *

- Very bad
- Bad
- Neither bad nor good
- Good
- Very good

To what extent did you enjoy your purchasing experience on HED online store (1 = not at all; 5 = hugely)?
Please answer only if you chose to purchase a product in the previous phase of the experiment.

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Section 2

While watching the video-clip, to what extent were you affected by one (or more) of the following emotions? *

	No affect	Minor affect	Neutral	Moderate affect	Major affect
Fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sadness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disgust	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boredom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indifference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extent did your emotional state change during the experiment (1 = not at all; 5 = hugely)? *

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extent did making a purchase improve your emotional state (1 = not at all; 5 = hugely)? Please answer only if you chose to purchase a product in the previous phase of the experiment.

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How did you like the experiment? *

- Very bad
- Bad
- Neither bad nor good
- Good
- Very good

Please share any additional comments (if any).

Your answer _____

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Appendix B – PPR Survey

PPR Survey – Control Group

To help us understand how to get to know you better, we would like to ask you a few questions about your satisfaction with the purchase so far. Please remember that there are no correct or preferred answers, and the questionnaire is anonymous.

***Required field**

To what extent did buying the product make you feel better while doing the experiment (1 = not at all; 5 = hugely)? *

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Next

Section 2

To what extent do you agree or disagree with the following sentences? *

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
I should have chosen something else than the one I bought.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I regret the product choice that I made.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I now realize how much better my other choices were.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I were to go back in time, I would choose something different to buy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extent do you agree or disagree with the following sentences? *

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
I regret getting the product because it was not as important to me as I thought it would be.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I wish I hadn't bought the product because it is now useless to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I regret my purchase because the product never served its purpose.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I regret my purchase because I did not need the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

To what extent do you agree or disagree with the following sentences? *

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
With more information, I feel that I could have made a better decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I feel that I did not put enough consideration into buying the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

With more effort, I feel that I could have made a better decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I regret not putting enough thought into my decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

To what extent do you agree or disagree with the following sentences? *

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
I expended too much effort in making my decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I wasted too much time in making my decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I think I put too much thought in the buying process.

I feel that too much time was invested in getting this product.

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PPR Survey – Treatment Group

To help us understand how to get to know you better, we would like to ask you a few questions about your satisfaction with the purchase so far. Please remember that there are no correct or preferred answers, and the questionnaire is anonymous.

***Required field**

Note: During the experiment, we showed you your electrodermal activity (EDA) obtained through the wristband and the consequent alterations in your emotional state.

To what extent did you think about your EDA and emotional alterations during your purchasing decision (1 = not at all; 5 = hugely)? *

1 2 3 4 5

To what extent did buying the product make you feel better while doing the experiment (1 = not at all; 5 = hugely)? *

1 2 3 4 5

Next

Section 2

To what extent do you agree or disagree with the following sentences? *

Strongly Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Strongly Agree

I should have chosen something else than the one I bought.

I regret the product choice that I made.

I now realize how much better my other choices were.

If I were to go back in time, I would choose something different to buy.

To what extent do you agree or disagree with the following sentences? *

Strongly Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Strongly Agree

I regret getting the product because it was not as important to me as I thought it would be.

I wish I hadn't bought the product because it is now useless to me.

I regret my purchase because the product never served its purpose.

I regret my purchase because I did not need the product.

To what extent do you agree or disagree with the following sentences? *

Strongly Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Strongly Agree

With more information, I feel that I could have made a better decision.

I feel that I did not put enough consideration into buying the product.

With more effort, I feel that I could have made a better decision.

I regret not putting enough thought into my decision.

To what extent do you agree or disagree with the following sentences? *

Strongly Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Strongly Agree

I expended too much effort in making my decision.

I wasted too much time in making my decision.

I think I put too much thought in the buying process.

I feel that too much time was invested in getting this product.

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Appendix C – Email of Product Delivery

HED

Your HED order no. 03 has reached the destination!



Hello X, we m(n)ailed it!

Your HED package has been delivered at your place!

You can find the order details below.

But there is **one more thing to go!**

We want to get to know you better, and that is why we would like to ask you to please fill out this short survey.

Take the survey

Order details



*Bold Instinct Eau de Toilette for Men –
David Beckham*

Size: 30 ml

Quantity: 1

Price: DKK 100

Address: X, Copenhagen

Check out my website [→](#)

Created with **Ascend** by Wix.

Appendix D – Final Mean EDA

	Group	EDA Baseline	EDA Emotional
1.	T	1.22908740	1.78078460
2.	C	1.79854957	1.82836639
3.	C	0.91647549	0.96873784
4.	C	0.16144876	0.22830422
5.	C	0.38508760	0.38806119
6.	T	0.05416211	0.07727591
7.	T	3.46787419	4.56780999
8.	T	0.69519541	0.70303658
9.	T	0.15701034	0.18144082
10.	C	3.28807882	4.26685051
11.	C	1.10558793	1.61247738
12.	C	0.16732648	0.17524901
13.	T	3.89031533	3.93236639
14.	C	0.48993403	0.49850612
15.	C	0.48575871	0.49340552
16.	T	9.03627078	19.16364140
17.	T	0.04390891	0.11225616
18.	T	1.87183759	2.38101619
19.	T	2.74916939	4.06676109
20.	T	0.66283584	1.13619407
21.	C	0.51227945	0.59432005

Appendix E – Individual Answers to PPR Survey

Group	PPR Type1a	PPR Type1b	PPR Type1c	PPR Type1d	PPR Type2a	PPR Type2b	PPR Type2c	PPR Type2d	PPR Type3a	PPR Type3b	PPR Type3c	PPR Type3d	PPR Type4a	PPR Type4b	PPR Type4c	PPR Type4d
1. C	1	1	1	1	2	2	2	1	2	2	3	2	2	1	2	1
2. C	1	1	1	1	1	1	1	1	1	1	1	1	4	2	4	3
3. C	5	4	4	5	4	3	5	2	5	4	5	3	2	2	2	3
4. C	4	4	5	5	5	4	5	3	5	3	5	3	3	3	3	3
5. C	3	1	1	3	1	1	1	1	1	3	4	3	3	1	1	1
6. C	5	4	4	5	5	4	4	1	2	5	4	5	1	2	3	3
7. C	4	4	5	5	5	4	5	3	5	3	5	3	3	3	3	3
8. C	5	4	4	5	2	2	2	4	5	5	5	5	3	2	1	1
9. C	5	4	5	5	4	3	3	5	5	5	5	5	2	1	1	1
10. C	5	4	4	5	2	2	2	4	5	5	5	5	3	2	1	1
11. T	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12. T	1	1	1	1	1	1	1	1	2	2	2	1	3	2	2	2
13. T	3	3	2	1	3	2	2	2	4	2	2	2	2	2	2	2
14. T	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15. T	2	2	3	3	4	3	1	1	3	4	4	2	3	3	2	3
16. T	1	1	1	2	2	2	1	2	2	1	2	2	4	4	2	3
17. T	5	4	4	4	5	3	2	4	2	4	4	5	1	2	1	1
18. T	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1
19. T	1	1	1	1	3	1	1	3	3	4	3	1	1	1	1	1
20. T	1	2	1	1	4	1	1	4	4	2	4	1	2	4	5	3

Appendix F – Aggregated Answers to PPR Survey

	Group	PPRType1	PPRType2	PPRType3	PPRType4
1.	C	1.00	1.75	2.25	1.50
2.	C	1.00	1.00	1.00	3.25
3.	C	4.50	3.50	4.25	2.25
4.	C	4.50	4.25	4.00	3.00
5.	C	2.00	1.00	2.75	1.50
6.	C	4.50	3.50	4.00	2.25
7.	C	4.50	4.25	4.00	3.00
8.	C	4.50	2.50	5.00	1.75
9.	C	4.75	3.75	5.00	1.25
10.	C	4.50	2.50	5.00	1.75
11.	T	1.00	1.00	1.00	1.00
12.	T	1.00	1.00	1.75	2.25
13.	T	2.25	2.25	2.50	2.00
14.	T	1.00	1.00	1.00	1.00
15.	T	2.50	2.25	3.25	2.75
16.	T	1.25	1.75	1.75	3.25
17.	T	4.25	3.50	3.75	1.25
18.	T	1.00	1.00	1.00	1.50
19.	T	1.00	2.00	2.75	1.00
20.	T	1.25	2.50	2.75	3.50

Appendix G – Individual Answers to Control Retail Therapy

To what extent did buying the product make you feel better while doing the experiment (1 = not at all; 5 = hugely)?

<i>Control Group</i>		<i>Treatment Group</i>	
1.	4	1.	3
2.	5	2.	5
3.	5	3.	4
4.	4	4.	5
5.	4	5.	3
6.	4	6.	4
7.	4	7.	4
8.	4	8.	5
9.	4	9.	4
10.	4	10.	5

Appendix H – Individual Answers to Control Reflectiveness

To what extent did you think about your EDA and emotional alterations during your purchasing decision (1 = not at all; 5 = hugely)?

1.	4
2.	2
3.	2
4.	4
5.	3
6.	4
7.	2
8.	2
9.	3
10.	4

Appendix I – Follow-up Survey on Products Value

We would like to thank you in advance for filling in this questionnaire for our master's thesis. We are conducting a survey aimed at understanding the monetary value you would associate with different products. It will take no more than one minute and your responses will be completely anonymous.

Thank you for your help!



Gender

Male

Female

Prefer not to say



This survey consists of evaluating the following products on a scale from DKK 0 to DKK 100 (around €13). Please select different answers for every product, meaning that **you cannot give the same value to every product**. Also, it might happen that you will see two identical products among the three options: don't worry, in this case you can give the same money value to both products.

How much would you value this product from DKK 0 to DKK 100 (around €13)?

0 10 20 30 40 50 60 70 80 90 100

Hoop Golden Earrings (XS) – Pilgrim



How much would you value this product from DKK 0 to DKK 100 (around €13)?

0 10 20 30 40 50 60 70 80 90 100

Scarf “Kaizer 4” – Magasin du Nord



How much would you value this product from DKK 0 to DKK 100 (around €13)?

0 10 20 30 40 50 60 70 80 90 100

Color Riche Lipstick – L’Oréal Paris



A horizontal slider bar with a red circle at the 0 mark and a red button with a white arrow pointing right at the 100 mark.

We thank you for your time spent taking this survey.
Your response has been recorded.