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Mestrado em Gestão de Informação
Master Program in Information Management

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Empirical study based on the framework for classifying emotions

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Dissertation presented as partial requirement for obtaining the Master's degree in Information Management

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THE EFFECT OF EMOTIONS ON HEALTHCARE WEARABLE TECHNOLOGY USE: EMPIRICAL STUDY BASED ON THE FRAMEWORK FOR CLASSIFYING EMOTIONS

by

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Dissertation presented as partial requirement for obtaining the Master's degree in Information Management, with a specialization in Knowledge Management and Business Intelligence

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February 2018

PUBLICATIONS

The effect of direct and indirect emoticons on healthcare wearable technology usage (in submission in an international journal).

ACKNOWLEDGEMENTS

Gostaria de escrever esta secção na minha língua materna para agradecer a todos que tornaram possível a realização da presente dissertação. Contei com o apoio direto e indireto de múltiplas pessoas e instituições às quais estou profundamente grata.

Ao meu orientador, Professor Doutor Tiago Oliveira. Agradeço todos os ensinamentos, conselhos, sugestões, experiência e dedicação. Contribuiu de forma inequívoca para o desenvolvimento e conclusão deste projeto. Qualquer erro ou omissão de informação é da minha inteira responsabilidade.

Aos meus pais, Maria João e Carlos. O que era de mim sem eles? Nem quero pensar. Agradeço do fundo do coração tudo aquilo que fizeram e fazem por mim, todos os dias. Se hoje esta tese está terminada, é graças a eles. Obrigada por todos os alicerces que me deram, pelo amor, carinho, estabilidade, inspiração e confiança que depositam em mim. Obrigada por não me deixarem não dar o melhor de mim. Obrigada por serem o melhor de/para mim. Cristiano Ronaldo? Eles é que são os melhores do mundo!

Ao meu namorado, Miguel. Por ser a calma no meio da tempestade. Por ter a capacidade de dizer e fazer com que tudo corra bem, mesmo quando parece que vai tudo correr mal. Por fazer tudo parecer simples e fácil. Pela paciência, pela amizade, pelo carinho, pelo respeito e sobretudo pelo amor. Por ser a melhor pessoa que podia ter ao meu lado. Por ser tudo num só. Obrigada é pouco. *(…) and after all, you're my wonderwall.*

Aos meus avós, à minha família. Por ficarem com o coração pequenino quando as coisas não correm bem e por festejarem comigo as minhas vitórias como se fossem vossas. Pelo orgulho que têm em mim e por todo o amor que me dão. Obrigada por tudo!

Aos meus amigos. Por constantemente me perguntarem como está a correr. Por constantemente me motivarem a fazer cada vez melhor. Por ficarem tão felizes com a entrega deste trabalho quanto eu. Ao Filipe por ser um amigo presente e constante ao longo de tantos anos, e que neste projeto não foi exceção. Agora sim, já não tenho desculpas para não ter tempo.

Aos pais do Miguel, Paula e Carlos. À mãe, pela preocupação, disponibilidade e revisões de inglês que fez e que tornaram este trabalho mais rigoroso, mais profissional, melhor. Obrigada!

À KPMG. Um agradecimento muito especial à Mónica Guerreiro, Mónica Silva e ao Duarte Nóbrega por toda a flexibilidade, preocupação e amizade que sempre demonstraram durante o meu percurso na KPMG. Um obrigada ainda maior pela prontidão em ajudarem-me mesmo quando os nossos caminhos se separaram. Aos *new joiners* de 2015 que deram sentido de forma muito simples à expressão *fun at work* e tanto me ajudaram na tarefa de trabalhar e estudar simultaneamente.

À Mind Source. Pela prontidão que mostrou em ajudar-me para fazer com que esta tese tivesse sucesso e por toda a compreensão nos últimos meses, estou muito grata. Um obrigada especial ao Ricardo Nicolau, por ser o melhor colega e professor que podia ter comigo na TAP.

Ao NASI. Pela disponibilidade, flexibilidade e compreensão durante a minha curta passagem pelo Montepio, o meu obrigada! Ao Tiago, pela sincera amizade que se manteve, o meu muito obrigada! Espero que esta dissertação esteja à altura dos rasgos de genialidade.

Obrigada a todos!

Beatriz Nina

RESUMO

Os dispositivos *wearable* são uma tendência de mercado. O número de consumidores deste tipo tecnologia tem aumentado significativamente desde 2016 e parece não parar, sobretudo na área da saúde e do *fitness*. Compreender o corpo e a saúde torna-se muito mais simples com estes dispositivos devido aos sensores inteligentes que possuem e que permitem obter dados biométricos em tempo real. Neste sentido, torna-se necessário entender as razões que levam a adoção destas tecnologias.

Diferente das pesquisas que foram realizadas na área da aceitação e do uso de tecnologias de informação, este estudo aplicou uma teoria baseada na classificação de emoções para perceber o efeito direto e indireto das emoções na utilização de dispositivos *wearable* na saúde e no *fitness*. Para tal, foi realizado um questionário em Portugal onde foram recolhidas 265 respostas válidas.

Os resultados do estudo provaram que as emoções não influenciam diretamente a utilização dos *wearables*, mas que se relacionam indiretamente através de comportamentos de adaptação e que moderam a relação entre a intenção e a utilização. Em geral, o modelo explicou 51% da variação na utilização destas tecnologias.

ABSTRACT

Wearable devices are a market trend. The number of consumers of this type of technology has significantly increased since 2016 and it will not stop, especially in healthcare area. Understanding health and body have become easier with these gadgets due to their intelligent sensors that allow biometric data to be collected in real time. Given this, it is necessary to understand the reasons that lead individuals to adopt these technologies.

Different from past researches in acceptance and use of information technology area, this study applied a theory for classifying emotions to understand the direct and indirect effect of emotions on healthcare wearable technology usage. For this purpose, an online questionnaire was administrated in Portugal where 265 valid answers were collected.

The results of the study proved that emotions do not directly influence the use of healthcare wearable devices, but they are indirectly related to IT use through adaption behaviours and they moderate the relationship between intention and usage. In general, the model explained 51% of the variance in wearable technology usage.

KEYWORDS

Healthcare wearable devices; behavioural intention; technology use; framework for classifying emotions

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ABREVIATIONS AND ACRONYMS LIST

ANG	Anger
AVE	Average Variance Extract
AXT	Anxiety
BI	Behavioural Intention
CA	Cronbach's Alpha
CIP	Concern for Information Privacy
CR	Composite Reliability
EHR	Electronic Health Records
ELM	Elaboration Likelihood Model
ETM	Excitement
HIT	Health Information Technology
HPN	Happiness
HTMT	Hetrotrait-Monotrait ratio
IS	Information System
IT	Information Technology
PD	Psychological Distance
PLS	Partial Least Squares
R	Coefficient of Determination
SIS	Seeking Instrumental Support
SSS	Seeking Social Support
TA	Task Adaption

TRA Theory of Reasoned Acceptance

TU Technology Use

UTAUT Unified Theory of Acceptance and Use of Technology

VA Venting

1. INTRODUCTION

Wearable devices or wearable technology are usually known as electronic gadgets that can be directly worn on the body as a part of clothing or as an accessory (Nasir & Yurder, 2015). These electronic technologies with accessory and sensor features, have shown their worth and usage in numerous fields (Li, Wu, Gao, & Shi, 2016) and they were first used for military purposes. Nowadays, a large number of wearable devices are available for public users (Gao, Li & Luo, 2014). According to Gao, Li and Luo (2014) and Chan, Estève, Fourniols, Escriba, and Campo (2012) the biggest usage of wearable devices can be found in the area of medicine and healthcare due to the natural advantages in these contexts. Extant related studies have shown that wearable devices are still in their initial stage.

Up until now, extant studies have focused on the design and implementation of information technology (IT) as well as on the adoption of electronic health records (EHR) (Holden & Karsh, 2010; Tavares, Goulão, & Oliveira, 2017). The studies carried out in this area have been focused on exploring new technologies and developing specific healthcare wearable devices (Li et al., 2016). Recently, there have been more studies focusing on the acceptance and adoption of IT through information systems theories. However, not much attention has been given to the emotional side (Beaudry & Pinsonneault, 2010), which are considered to be imperative drivers of behaviours. This study applies to healthcare wearable technology use a model based on four types of emotions: achievement emotions, challenge emotions, loss emotions, and deterrence emotions, to explain the usage of healthcare wearable technology.

The driver of this study is to propose a complete model that explains individuals' adoption of healthcare wearable devices. By doing this, managers would have the opportunity of promoting better marketing plans in order to attract more customers and to promote healthcare wearable devices (Li et al., 2016), appealing to the emotional side of the consumers. From a psychological point of view, it will help consumers dealing with negative emotions during the utilization of IT and it will give them the opportunity to trigger specific challenging emotions related to IT use (Beaudry & Pinsonneault, 2010).

This paper uses an emotion-based model which will take into account the full spectre of emotional reactions, both direct and indirect, of individuals and account for their relationships on IT use. Since the research efforts on technology use have been dominated by technology perspectives (Davis, 1989; Venkatesh, Thong, & Xu, 2012; Venkatesh et al., 2003), the behavioural intention was only studied in order to understand which system features would be appropriate to maximise user behaviour intention so the system would have a greater use. However, this purpose does not contemplate the process of transforming behavioural intention into behaviour (i.e. usage). As so, we will also take into consideration meaningful moderators (the direct emotions) that may explain the relationship between behavioural intention and behavioural usage and may turn intention into use. The model aims to produce useful insights into the emotional and cognitive reactions of individuals towards technology usage (Compeau, Higgins, & Huff, 1999) and therefore, fulfil the gap in the literature.

This article has the following structure: the Section 2 presents the theoretical background, specifically the definition of wearable technology, the prior research on customers' acceptance of technology, and previous research on emotion-based models. In Section 3 the conceptual model will be explain as well as the hypothesis that will be tested. Section 4 covers the methods used in the research. Section 5 and 6 contain the analysis of the data and the discussion of the results, respectively. Section 7 contains the conclusion.

2. THEORITICAL BACKGROUND

2.1 THE CONCEPT OF HEALTHCARE WEARABLE TECHNOLOGY

As IT continues to evolve, mobile devices are getting smarter and have become crucial tools for communication (Yang, Yu, Zo, & Choi, 2016). Due to its popularity, mobile devices are diversifying into several classes such as tablets, smartphones, and wearable technology. Even though wearables are still in an early stage, the global wearable devices market is increasing progressively. According to International Data Corporation (IDC) (2017), the wearables market took another step with a total shipment volume reaching 26.3 million units (corresponding to a 7.3 percent grow) in the third quarter of 2017. Nowadays, the biggest usage of wearable technology is in the areas of medicine and healthcare (Chan et al., 2012; Li et al., 2016).

Wearable devices present themselves as a being major market trend, especially in healthcare area (Nasir & Yurder, 2015). This kind of data can be gathered and changed in real-time, since users usually wear the gadget the whole day. Despite their direct advantages such as controlling the calories burned, monitoring heart rate, cholesterol, blood sugar, and counting the hours of deep sleep, these devices have the capacity of providing unseen scanning and sensory features which will improve the quality of doctor-patient relationship (Gao, Li & Luo, 2014).

"*The electronic technology that is incorporated into accessories that can be directly worn on the body is widely known as wearable technology"* (Gao et al., 2015, *p.1704*). Typically, these technologies are equipped with intelligent sensors that take advantage of web connections that use Bluetooth to connect to a smartphone or a tablet. Research by Gao, Li and Luo (2014) supports that healthcare wearable devices can be of two types: fitness wearable devices, which are related to tracking and monitoring daily fitness conditions and that are more suitable for younger and healthier users; and medical wearable devices which are designed for certain kind of diseases such as diabetes, heart problems or cancer. Generally, elder and unhealthy individuals are the ones who tend to adopt medical wearable devices. This study focuses on healthcare wearable devices concept as a joint between fitness wearable devices and medical wearable devices.

2.2 ADOPTION MODELS AT INDIVIDUAL LEVEL

2.2.1 Prior research on healthcare wearable technology acceptance

Wearable technology is the new hot topic and for that reason there are few empirical research that analyse the consumers' acceptance of wearable devices (Nasir & Yurder, 2015). It has been already recognized that assessing the factors of IT acceptance is crucial to address the underutilization problem and to improve the benefits of IT investments (Miltgen, Popovič, & Oliveira, 2013), particularly in technologies such as wearables.

As Gao, Li and Luo (2014) wrote, healthcare wearable devices are considered to be a kind of health information technology (HIT) product. Given this, the existence studies about HIT adoption would offer theoretical foundations for studies regarding the acceptance of wearable technology. Studies about several HIT products were made from a technology perspective, such as clinical decision support systems (Johnson, Zheng, & Padman, 2014), electronic health record (Angst & Agarwal, 2009; Tavares & Oliveira, 2016; Tavares, Goulão & Oliveira, 2017), and biometrics (Miltgen et al., 2013). Numerous theories have been applied to explore HIT adoption in these prior studies, namely technology acceptance model (TAM) derived analysis (Johnson et al., 2014), elaboration likelihood model (ELM) (Angst & Agarwal, 2009), concern for information privacy (CIP) (Angst & Agarwal, 2009), unified theory of acceptance and use of technology (UTAUT) (Miltgen et al., 2013; Tavares & Oliveira, 2016; Tavares, Goulão & Oliveira, 2017), and diffusion of innovations (Miltgen et al., 2013).

Besides the analysis above, there are also some studies trying to investigate the factors that lead to wearable technology acceptance, and some of them from a healthcare perspective. Although the target technology may vary, one can take several conclusions, as shown in Table 2.1.

Purpose	Theory	Findings	Reference
How individuals adopt and use healthcare wearable devices.	Privacy Calculus Theory	▪ Personal innovativeness, health information sensitivity, legislative protection, and perceived prestige are significant when predicting behavioural intention; ▪ Perceived benefit negatively influence perceived privacy risk and positively influence individuals' adoption intention.	(Li et al., 2016)
Consumers' intention to adopt wearable technology in healthcare; The moderating effects of product type on consumers' adoption intention.	UTATUT2; Protection Motivation Theory; Privacy Calculus Theory	▪ Health behaviour and privacy context perspectives influence healthcare wearable technology adoption; ▪ Functional congruence, perceived privacy risk, hedonic motivation, social influence, and perceived vulnerability influence fitness wearables use; ▪ Effort expectancy, perceived expectancy, perceived security, and self-efficacy influence healthcare wearables use.	(Gao, Li & Luo, 2014)
Consumers' intention to use smartwatches; Factors and perceptions that drive adoption; How consumers classify the technology.	TAM	▪ Perceived usefulness and visibility influence adoption intention; ▪ Perceived ease of use is indirectly related to attitude towards using smartwatches.	(Chuah et al., 2016)
Analyse models that can explain perception, attitudes, and intention towards smart clothing.	Extended TAM (plus fashion factors)	▪ Perceived usefulness is the most important variable that influences consumers' attitude towards wearable technology acceptance.	(Chae, 2009)
Predict the dynamics in the process which consumers	Theory of planned	▪ Perceived usefulness and perceived behavioural control indirectly influence purchase intention	(Turhan,

accept wearable technology.	behaviour; TAM	through its effect on attitude.	2013)

Table 2.1. Wearable technology studies

In order to explain behavioural intention, most of the research in this area (Chae, 2009; Chuah et al., 2016; Turhan, 2013) uses the technology acceptance model (TAM). TAM is considered to be one of the most used approaches to explain the acceptance, adoption and usage intention of a new technology. It was proposed by Davis (1989) as an adaption of the theory of reasoned action (TRA). According to this theory, there are two constructs essential to understand technology acceptance: the perceived ease of use and perceived usefulness. For instance, Chuah et al., (2016) used TAM to investigate the factors that explain consumers' intention to use a smartwatch, but also extended it by incorporating visibility as another construct, and by adapting the definition of perceived usefulness, since the study is from a consumers' perspective. As so, one can conclude that there is a lack of studies regarding emotions on IT acceptance.

2.2.2 Prior research on emotion-based models

As described above, early research has been primarily based on information systems theories and little attention has been given to emotions. As Beaudry and Pinsonneault (2010) state, emotions are important drivers of behaviours. Concerning the information systems models/theories such as TAM, UTAUT and the innovation diffusion theory, behaviour (e.g., the use of healthcare wearable devices) is viewed as the result of a set of beliefs about technology (Compeau et al., 1999) and they predict the usage of IT considering the perceptions and beliefs about the instrumental nature of technology (Beaudry & Pinsonneault, 2010). The beliefs are represented by the perceived characteristics of innovating in innovation diffusion research and by perceived usefulness and perceived ease of use in TAM (Compeau et al., 1999). However, the use of an IT is not simple and, as research in the psychological field shows, information system models do not get the full essence of behaviours. Emotions have a powerful role in every individuals' lives since emotions influence attitudes, actions, beliefs and interfere with decision-making processes. (Beaudry & Pinsonneault, 2010; Thagard, Gratch, & Marsella, 2004).

The concept of emotion is not consensual among psychologists, but they all agree that it is a complex state of the organism, involving physical and mental changes (Smith & Lazarus, 1992). Given that, by emotion we mean a "*mental state of readiness for action that promote behavioural activation and help prioritize and organize behaviours in ways that optimize individual adjustments to the demands of the environment*" (Beaudry & Pinsonneault, 2010, *p.690*). Given this, one can conclude that emotions influence behaviours or variations in action willingness (Beaudry & Pinsonneault, 2010).

Based on extant research, there are few emotions that have been studied in order to understand their influence on IT use. Besides that, those few emotions have been studied along with cognitive models of acceptance (e.g. anxiety in UTAUT) (Venkatesh et al, 2003).

In 2010, Beaudry and Pinsonneault proposed a model for classifying emotions based on the appraisal theory of emotions (Folkman & Lazarus, 1985; Smith & Ellsworth, 1985) and on the coping model of user adaption (Beaudry, & Pinsonneault, 2005). The aim of the paper was to study the direct and indirect emotions on IT use of a new bank system. Beaudry and Pinsonneault (2005) suggested that the reactions of the individuals to new IT implementation rely on the evaluation of their personal and professional significance and are set by primary assessment (i.e. the user evaluates the outcome of the IT event) and secondary assessment (i.e., the user evaluates his or her control over the situation). This framework combines these two dimensions to group emotions into four distinct classes that Beaudry and Pinsonneault (2010) labelled *loss, deterrence*, *challenge*, and *achievement*. Since it was an exploratory research, the authors decided to study only the direct effect one emotion per group on IT usage and the indirect effect of each emotion over adaption behaviours, as seen in the Figure 2.1.

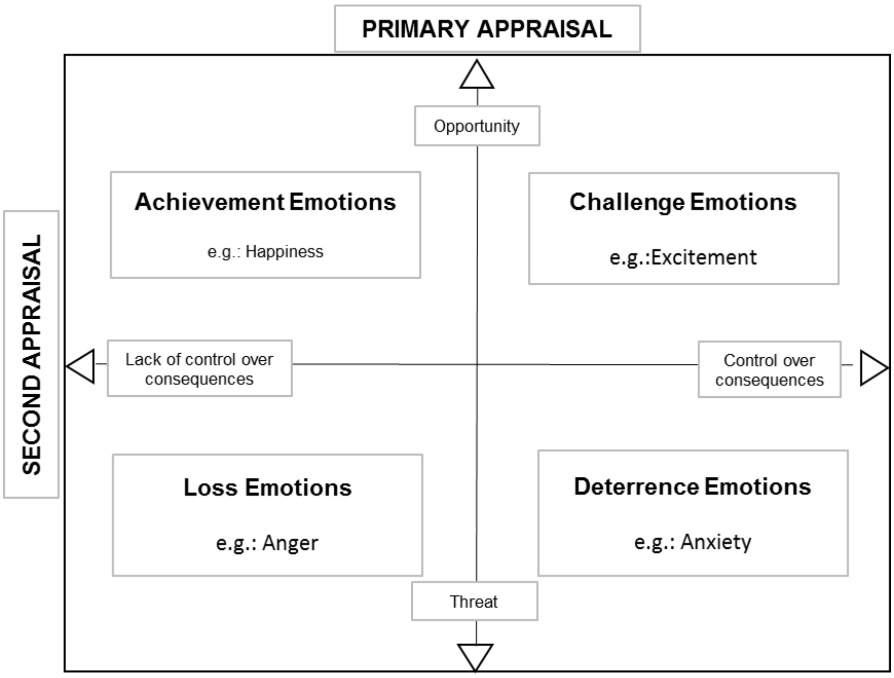


Figure 2.1. Adapted framework for classifying emotions based on Beaudry & Pinsonneault (2010)

3. RESEARCH MODEL

To explain individuals' technology acceptance of healthcare wearable devices, the proposed model is the emotion-based framework for classifying emotions. The aim of this study is to understand the impact of direct and indirect emotions on wearable technology acceptance, from the consumer point of view. Since earlier studies (Beaudry & Pinsonneault, 2010; Venkatesh, 2000) show the need to incorporate psychological factors (i.e. emotions) in technological models, we test the framework proposed by Beaudry and Pinsonneault (2010) in the context of healthcare wearable technology. In order to do so, we proposed the same emotions that exist on the framework for classifying emotions, making some adjustments in the relationships between the emotions and in the way we test the model, so it can fit the wearables area. Since behavioural intention is considered to be an important driver of technology use, we had this construct to the proposed model. Although there are several variables that may impact the relationship between intention and use, they need to be addressed in order to fully capture the effect of intention on behaviour usage. As so, we also purpose four moderators (anger, anxiety, excitement, and happiness) to better understand the link between intention and healthcare wearable technology use. The conceputal model is represented in the Figure 3.1.

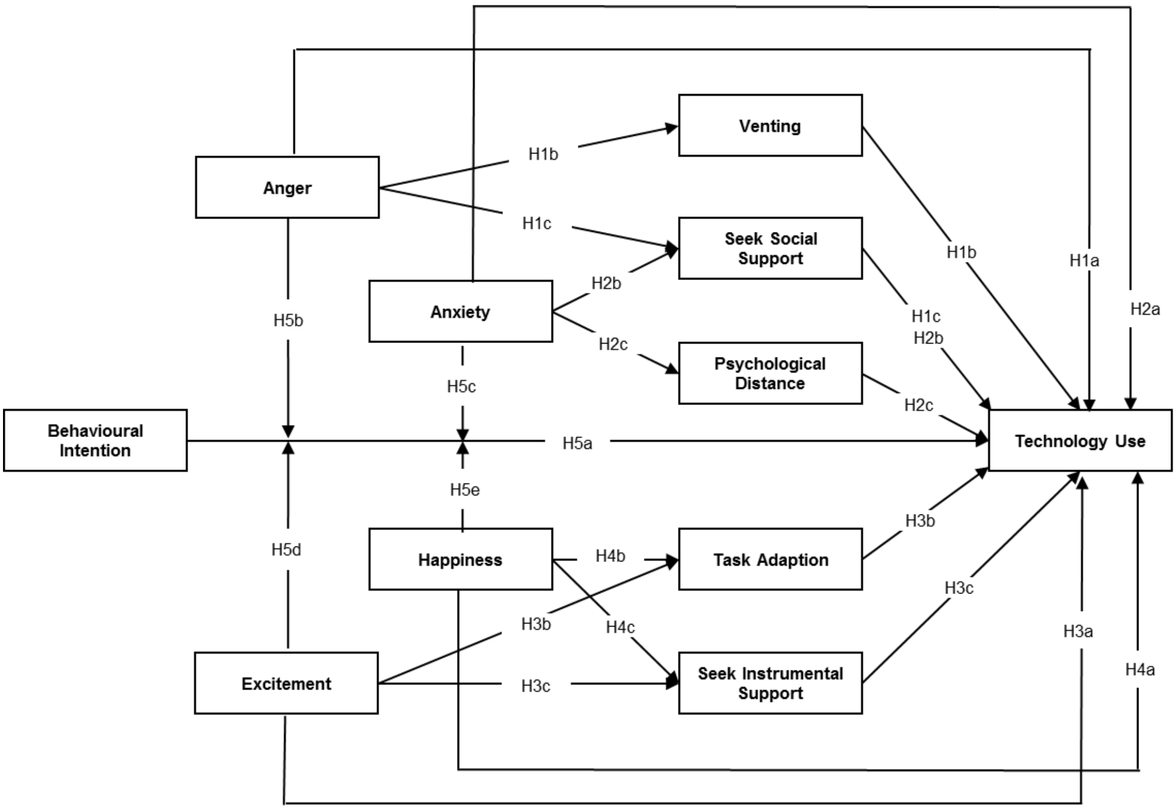


Figure 3.1. Conceputal model

3.1 LOSS EMOTIONS (ANGER AND HEALTHCARE WEARABLE TECHNOLOGY USE)

This group of emotions suggests that an IT event is associated with a threat and a lack of control over its outcomes (Beaudry & Pinsonneault, 2010).

3.1.1 Direct effect of anger on healthcare wearable technology usage

Generally, anger is related to the desire to punish the individual responsible for the frustration. In an IT implementation context, this suggests that anger is associated with the efforts to decrease the relevance of the IT event and to limit its usage. Anger has been found to be negatively associated with frequency of use and customer satisfaction when caused by failures or errors during the use of self-service technology, as healthcare wearable devices (Beaudry & Pinsonneault, 2010). As so, we believe that anger is negatively associated with the usage of IT.

H1a: Anger will negatively influence the use of healthcare wearable technology.

3.1.2 Indirect effects of anger on healthcare wearable technology usage

As anger is related to the belief that other individuals are accountable for the undesirable situation, this emotion may be associated with two adaptation behaviours, such as venting and seeking social support. Venting is the act of openly expressing emotions and blaming others for the actual outcome of an IT event. Studies about the complaints ensuing the implementation of a health management system reveled individuals refused to use new IT systems (Lapointe & Rivard, 2005). As so, we believe venting will strengthen the negative relationship between anger and the usage of healthcare wearable devices.

H1b: Anger will positively influence venting which will negatively influence the use of healthcare wearable technology.

As anger causes an emotional instability, individuals look for help. Seeking social support is defined as looking for understanding, advice, and moral support from family and friends. We expect that when individuals are having trouble using wearable devices, the impact of anger on healthcare wearable technology use will be countered by seeking social support.

H1c: Anger will positively influence seeking social support which will positively influence the use of healthcare wearable technology.

3.2 DETERRENCE EMOTIONS (ANXIETY AND HEALTHCARE WEARABLE TECHNOLOGY USE)

This group of emotions arises when an IT event is associated with a threat. The individuals experiencing these type of emotions feel they might have some control over its consequences (Beaudry & Pinsonneault, 2010).

3.2.1 Direct effect of anxiety on healthcare wearable technology usage

Anxiety is characterized by appraisals of facing uncertain existential threats (Han, Lerner, & Keltner, 2007). Extant research made in IS advocates that the relationship between anxiety and IT use is negative (Compeau et al., 1999). This emotion has also been found to be negatively associated with perceived ease of use (Davis, 1989), attitudes toward use (Venkatesh, 2000), and intention to use (Venkatesh et al., 2003). In healthcare, anxiety can be related to the outcome of a wearable technology (e.g., individuals who normally have high blood pressure and are not feeling well, may be nervous when using the wearable device for fearing the results the device might generate). As so, we believe that anxiety in the context of healthcare wearable technologies will be negatively related with IT use.

H2a: Anxiety will negatively influence the use of healthcare wearable technology.

3.2.2 Indirect effects of anxiety on healthcare wearable technology usage

Research in psychology suggests that anxiety will be associated to the actions that lead to reduce uncertainties. As so, anxiety will be related to IT usage through two adaption behaviours: seeking social support and psychological distance. As described above, seeking social support will work as a workaround that allows individuals to overcome the anxiety and turn the experience of IT usage into something positive (Beaudry & Pinsonneault, 2010). As so, we believe that the negative impact of anger on IT use will be countered by seeking social support.

H2b: Anxiety will positively influence seeking social support which will positively influence the use of healthcare wearable technology.

Psychological distancing can be defined as the act of directing one's attention away from the problem (Yi & Baumgartner, 2004). The paper conducted by Beaudry and Pinsonneault (2010) was one of the first studies that looked directly to psychological distance. As so, we believe that in the wearables field, psychological distance will impede the adaption of the product (watch, band) and block the resolution of problems.

H2c: Anxiety will positively influence psychological distance which will negatively influence the use of healthcare wearable technology.

3.3 Challenge Emotions (Excitement and Healthcare Wearable Technology Use)

This group of emotions occurs when an IT event is associated with an opportunity possibly resulting in positive consequences. Individuals feel they have some control over its outcomes (Beaudry & Pinsonneault, 2010).

3.3.1 Direct effect of excitement on healthcare wearable technology usage

Individuals who are thrilled about the potential benefits that an IT has to offer, will try to seek these benefits by using the product. The empirical studies made in IS purpose that excitement is probable to be positively associated with IT usage. Since wearable devices are an emergent technology, individuals are amused with their features and capacities. We expect that excitement will be positively related to healthcare wearable technology use (Beaudry & Pinsonneault, 2010).

H3a: Excitement will positively influence the use of healthcare wearable technology.

3.3.2 Indirect effects of excitement on healthcare wearable technology usage

Excitement will trigger task adaption, that is, the degree to which users modify their activities. Beaudru and Pinsonneault (2005) found that in order to adapt themselves to a certain technology, individuals alter their tasks so they increase the benefits of using a given IT. Therefore, we believe task adaption will strengthen the positive effect of excitement on healthcare wearable devices usage.

H3b: Excitement will positively influence task adaption which will positively influence the use of healthcare wearable technology.

Besides, individuals who experience this emotion will look for instrumental help from friends, online support, or instructions manual. This means users who are excited about an IT application will look for instrumental support to better explore all the possible features of the technology. We believe that by discovering all the features that wearable technology as to offer, individuals will take as much benefit as possible of the product. We believe seeking instrumental support will strengthen the positive effect that excitement has on healthcare wearable technology usage.

H3c: Excitement will positively influence seeking instrumental support which will positively influence the use of healthcare wearable technology.

3.4 Achievement Emotions (Happiness and Healthcare Wearable Technology Use)

This group of emotions occur when an upcoming IT event is expected to generate positive results (Beaudry & Pinsonneault, 2010).

3.4.1 Direct effect of happiness on healthcare wearable technology usage

Generally, happiness is related to the desire of taking advantage from a certain situation but not invest additional effort on it. In IS field, the satisfaction felt when a goal is achieved is often related to happiness. Similarly, pleasure, defined as a pleasant sensation that an individual feels about the performance of an IT product, has been found to have a positive association with antecedents of IT usage, as perceived ease of use (Venkatesh, 2000), and intention to use (Davis, 1989). In self-service technology, such as wearable technology, happiness can be related to satisfaction of using an IT product. As so, this emotion is believed to be positively related to healthcare wearable technology usage.

H4a: Happiness will positively influence the use of healthcare wearable technology.

3.4.2 Indirect effects of happiness on healthcare wearable technology usage

As Ellsworth and Smith (1988) suggested happiness can be related to passivity. As so, individuals tend to be satisfied and to appreciate the consequence of a situation. In the IS context, happiness is considered a low activation emotion. It is expected that in the wearables field, happiness will perform the same behaviour. As so, it is not expected that happiness will trigger intermediate behaviours such as task adaption or seeking instrumental support.

H4b: Happiness will not be related to task adaption.

H4c: Happiness will not be related to seeking instrumental support.

3.5 BEHAVIOURAL INTENTION ON HEALTHCARE WEARABLE TECHNOLOGY USE

Behavioural intention can be defined as the individual's desire to perform a certain behavior (Venkatesh , Michael G . Morris , Gordon B . Davis et al., 2003) and it is considered as one of the key predictor of technology use (Venkatesh et al., 2012). Research made show the substantial impact of behavioural intention on usage behavioural in several areas, such as internet banking (Martins, C., Oliveira, T. and Popovič, 2014). As so, we believe that behavioural intention will be positively and significantly associated with healthcare wearable technology use. However, because behavioural intention is motivational by definition (i.e. *desire*), an emotion is necessary to transform these motivations into behaviour. As so, we believe that direct emotions will moderate the effect of behavioural intention on technology use.

H5a: Behavioural intention will positively influence the use of healthcare wearable technology.

H5b: Anger will be moderating the effect of behavioural intention on healthcare wearable technology use.

H5c: Anxiety will be moderating the effect of behavioural intention on healthcare wearable technology use.

H5d: Excitement will be moderating the effect of behavioural intention on healthcare wearable technology use.

H5e: Happiness will be moderating the effect of behavioural intention on healthcare wearable technology use.

4. METHODS

4.1 MEASUREMENT

The items used were mainly adopted from Beaudry and Pinsonneault (2010), with some adjustments, in order to better fit the context of healthcare wearable devices. The Appendix A contains all the items. The measurement of the scales' items was a seven-point range scale, ranging from "strongly disagree" (1) to "strongly agree" (7). We also include in the questionnaire demographic questions about gender, age and level of education; we coded gender as a binary variable (0 or 1), 1 representing males and age was measured in years. An introduction explaining the concept of healthcare wearable technology and the purpose of the study was made before the respondents could see the questions. The purpose of this introduction was to guarantee that the respondents were aware of the concept, confidentiality protection, and the anonymity of the information collected.

4.2 DATA

A pilot survey was administrated in October 2017 in order to guarantee the validation of the scale and the questions of the survey. From the conducted survey we obtained 30 responses confirming the validation and the reliability of that all the items.

The main survey was sent by email in November 2017 to one institution that provide educational services, to an IT company, and to fitness institutions, a total of 1024 individuals. The questionnaire was available for four weeks and we obtain 647 responses. After excluding the responses of individuals who not use wearable technology devices, we obtained a total of 345 responses. We considered that the questionnaire was not valid if there were unanswered questions. In accordance to our statistical modelling, we cannot use incomplete questionnaires (Sleuwaegen, 2009; Oliver, Liehr-gobbers, & Krafft, 2010). As so, after excluding the invalid ones, we obtained a total sample of 265 respondents (see Table 4.1). To test if there were systematic bias affecting our data we used the Lindell and Whitney's method (2001). We employed a theoretically unrelated construct (marker variable) to adjust the correlations among the principal constructs. We obtain 2.76% of maximum shared variance with the other variables in the model, which indicates no systematic bias in the data.

Measure	Item	*N*	Percentage (%)
Gender	Female	122	46.04
	Male	143	53.96
Age	Under 20	11	4.15
	20 – 29	120	45.28
	30 – 39	64	24.15
	40 – 49	37	13.96
	50 – 59	27	10.19
	Above 60	6	2.26
Education	Junior High School	4	1.51
	High School	41	15.47
	Graduate	143	53.96
	Master	73	27.55
	Doctorate	4	1.51
Job	Student	34	12.83
	Retired	14	5.28
	Unemployed	7	2.64
	Employed	197	74.34
	Self-employed	9	3.40
	Freelancer	4	1.51

Table 4.1. Sample Characteristics (*n=265*)

As demonstrated above, more than 50% of our sample have more than 30 years old and are mainly men (around 54%). Most of the respondents are graduated or more (54%) and only 13% are students.

5. RESULTS

In order to test the research model, we used the partial least squares (PLS). PLS is a variance-based technique and it will be used on this study due to the fact that: (i) PLS method has the ability of being used as a theory-building method - it is the first time this model will be tested on wearable technology (ii) none of the items in the data follow a normal distribution; (iii) the research model is considered to be complex. In the following subsections we analyse the measurement model to evaluate indicators' reliability, constructs' reliability, convergent validity, and discriminant validity. After analysing the measurement model, we test the structural model. Smart PLS 3.0 was the software used to estimate the model (Ringle, Wende, & Becker, 2015).

5.1 MEASUREMENT MODEL

Firstly, the loadings should be higher than 0.7 (Chin, 1998; Henseler et al, 2009) to be considered a good indicator reliability. However, it is recommended to eliminate an item whose outer loadings are below 0.4 (Churchill, 1979). All items have loadings higher than 0.7 except for PD2, PD3, and SIS4, which were dropped from our model. SIS3 loading is less than 0.7 but still greater than 0.4, confirming that the indicator reliability is accomplished (Appendix B).

Secondly, to evaluate construct reliability, there are two criteria that can be used – Cronbach's alpha (CA) and composite reliability coefficient (CR). Even though CA is more commonly used, CR is suitable for PLS, once it takes into account that indicators have different loadings and it ranks indicators in accordance to their individual reliability, contrary to CA. As seen in Appendix B, all the constructs show the values for CA and CR greater than 0.7, supporting for construct reliability (Henseler et al., 2009).

Thirdly, to evaluate convergent validity, average variance extracted (AVE) was used. AVE should be greater or equal than 0.5 so that the latent variable explains, on average, more than half of the variance of its own indicators (Henseler et al., 2009). As shown in Appendix B, all the constructs respect this condition, assuring convergent validity.

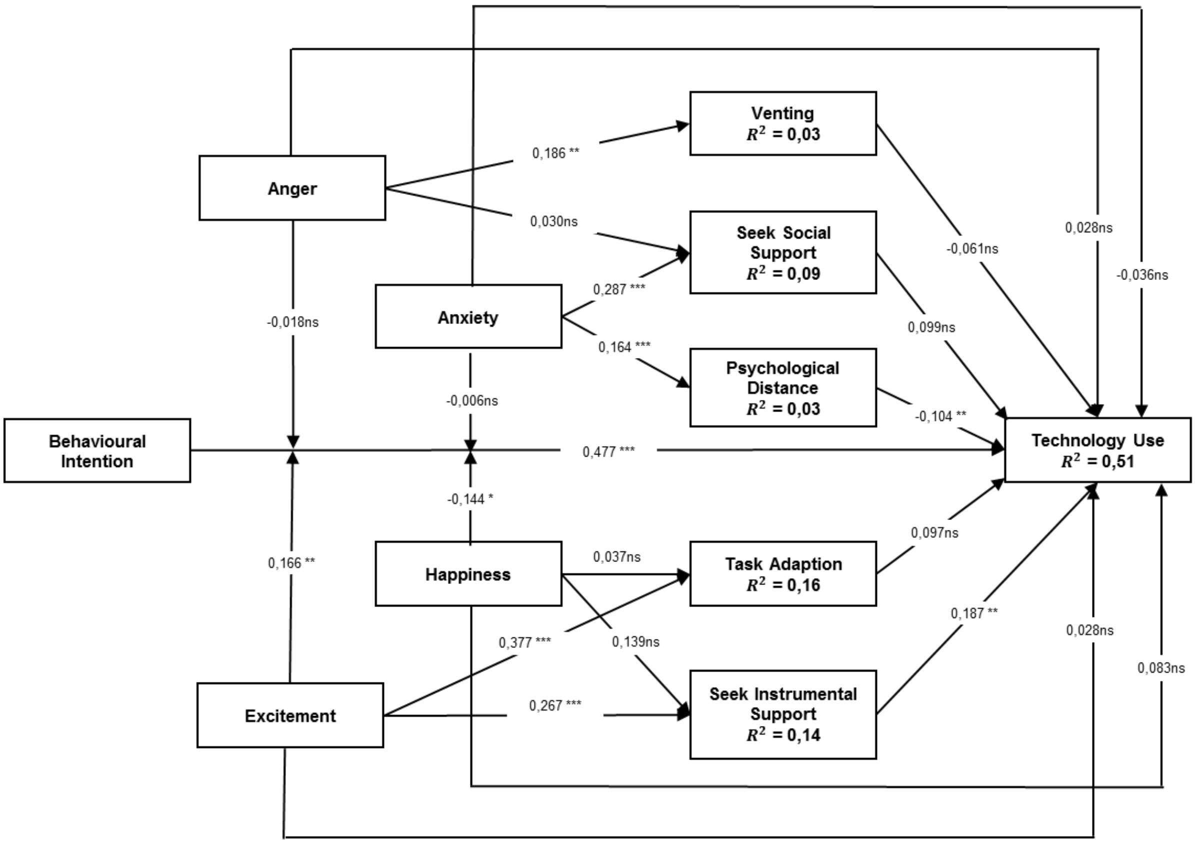
Finally, the discriminant validity can be assessed by three criteria. Fornell-Larcker criterion is the first one, which claims that the root square of AVE (Appendix C) for each latent variable shares more variance with its indicators than with any other latent variable (Fornell & Larcker, 1981). As seen in Appendix C, all the square roots of AVE (diagonal elements) are greater than the correlation between constructs (off diagonal elements), proving this criteria is accomplished. The second criterion states that for each construct, the loadings must be greater than all of its cross-loadings (Chin, 1998). As shown in the Appendix D, each construct has higher values than their cross loadings. Finally, the Hetrotrait-Monotrait ratio (HTMT) claims that all values should be below the threshold of

0.9 (Henseler, Ringle, & Sarstedt, 2014). As we can conclude form the Appendix E, all the values satisfy the condition.

Therefore, all the measures satisfy the discriminant validity of the constructs. The assessment of the construct reliability, convergent validity and indicator reliability, yield satisfactory results, demonstrating that the conceptual model can be tested by the used constructs.

5.2 STRUCTURAL MODEL

We demonstrated above the measurement model is satisfactory. In this subsection the structural model will be tested. A bootstrapping of 5000 resamples was used to estimate the path coefficients' significance (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). Figure 3 shows the path coefficients, their significance level, and the coefficient of determination (R^2). To evaluate the structural model, the R^2 was used. The model explains 51% of the overall variation in healthcare wearable technology usage.



Notes: * p<0.10, **p<0.05, ***p<0.01

Figure 5.1. Structural model results

As shown in the top of the Figure 5.1, anger was not directly associated with IT use ($\hat{\beta}$ = 0.028; p > 0.10), contrary to our expectations (H1a not supported). Anger was positively related to venting ($\hat{\beta}$ = 0.186; p < 0.05), but venting was not associated with IT use ($\hat{\beta}$ = -0.061; p > 0.10) (H1b partial supported). Finally, anger was not associated with seeking social support ($\hat{\beta}$ = 0.030; p > 0.10), which was not related to IT use ($\hat{\beta}$ = 0.099; p > 0.10) (H1c not supported), contrary to what we were expecting.

Anxiety, against our theory, was not directly related to IT use ($\hat{\beta}$ = -0.036; p > 0.10) (H2a not supported). It was positively associated with seeking social support ($\hat{\beta}$ = 0.287; p < 0.01), which was not associated with IT use ($\hat{\beta}$ = 0.099; p > 0.10) (H2b partial supported). Finally, as hypothesized, anxiety was positively related to psychological distancing ($\hat{\beta}$ = 0.164; p < 0.01), which was negatively related to IT use ($\hat{\beta}$ = -0.104; p < 0.05) (H2c supported).

Regarding the positive emotions in the bottom of the Figure 5.1, excitement was not significantly directly associated IT use ($\hat{\beta}$ = 0.028; p > 0.10) (H3a not supported), against our thoughts. However, it was positively related to task adaption ($\hat{\beta}$ = 0.377; p < 0.01), which in turn, was not significantly associated with IT use ($\hat{\beta}$ = 0.097; p > 0.10) (H3b partial supported). Lastly, excitement showed to be positively related to seeking instrumental support ($\hat{\beta}$ = 0.267; p < 0.01), which was associated with IT use ($\hat{\beta}$ = 0.187; p < 0.05) (H3c supported).

Happiness is not directly associated with IT use ($\hat{\beta}$ = 0.083; p > 0.10) (H4a not supported), contrary to what we have hypothesized. Our results corroborate with hypothesis H4b and H4c, which indicated that there was no relationship between happiness and task adaption nor with seeking instrumental support ($\hat{\beta}$ = 0.037; p > 0.10) (H4b supported), ($\hat{\beta}$ = 0.139; p > 0.10) (H4c supported).

Finally, as expected, behavioural intention showed a strong positive association with IT use ($\hat{\beta}$ = 0.477; p < 0.01) (H5a supported). However, the influence of behavioural intention on IT use is not moderated by anger or anxiety ($\hat{\beta}$ = -0.018; p > 0.10) (H5b not supported) and ($\hat{\beta}$ = -0.006; p > 0.10) (H5c not supported), respectively. Otherwise, excitement positively moderate behavioural intention on technology use ($\hat{\beta}$ = 0.166; p < 0.05) (H5d supported) and happiness negatively moderate the effect of behaviroual intention on technology use ($\hat{\beta}$ = -0.144; p < 0.10) (H5e supported).

6. DISCUSSION

6.1 THEORETICAL IMPLICATIONS

The obtained results fully support 7 and partial support 3 of our 17 hypotheses. Anger and anxiety explained 3%, 9% and 3% of venting, seeking social support and psychological distancing, respectively. Happiness and excitement explained 16% and 14% of task adaption and seeking instrumental support. The overall model explains 51% of technology use, suggesting that indirect emotions and direct emotions moderating behavioural intention are important drivers of IT use. Table 6.1 summarizes the hypotheses we tested and principal findings based on statistical tests.

Hypotheses	Path	Findings	Result
H1a	ANG → TU	Non-significant effect ($\beta = 0.028; p > 0.10$)	Not supported
H1b	ANG → VA VA → TU	Positive and statistically significant ($\beta = 0.186; p < 0.05$) Non-significant effect ($\beta = -0.061; p > 0.10$)	Partial supported
H1c	ANG → SSS SSS → TU	Non-significant effect ($\beta = 0.030; p > 0.10$) Non-significant effect ($\beta = 0.099; p > 0.10$)	Not supported
H2a	AXT → TU	Non-significant effect ($\beta = -0.036; p > 0.10$)	Not supported
H2b	AXT → SSS SSS → TU	Positive and statistically significant ($\beta = 0.287; p < 0.01$) Non-significant effect ($\beta = 0.099; p > 0.10$)	Partial supported
H2c	AXT → PD PD → TU	Positive and statistically significant ($\beta = 0.164; p < 0.01$) Negative and statistically significant ($\beta = -0.104; p < 0.05$)	Supported
H3a	ETM → TU	Non-significant effect ($\beta = 0.028; p > 0.10$)	Not supported
H3b	ETM → TA TA → TU	Positive and statistically significant ($\beta = 0.377; p < 0.01$) Non-significant effect ($\beta = 0.097; p > 0.10$)	Partial supported
H3c	ETM → SIS SIS → TU	Positive and statistically significant ($\beta = 0.267; p < 0.01$) Positive and statistically significant ($\beta = 0.187; p < 0.05$)	Supported
H4a	HPN → TU	Non-significant effect ($\beta = 0.083; p > 0.10$)	Not supported
H4b	HPN → TA	Non-significant effect ($\beta = 0.037; p > 0.10$)	Supported
H4c	HPN → SIS	Non-significant effect ($\beta = 0.139; p > 0.10$)	Supported
H5a	BI → TU	Positive and statistically significant ($\beta = 0.477; p < 0.01$)	Supported
H5b	ANG x BI → TU	Non-significant effect ($\beta = -0.018; p > 0.10$)	Not supported
H5c	AXT x BI → TU	Non-significant effect ($\beta = -0.006; p > 0.10$)	Not supported
H5d	ETM x BI → TU	Positive and statistically significant ($\beta = 0,166; p < 0,05$)	Suported
H5e	HPN x BI → TU	Negative and statistically significant ($\beta = -0.144; p < 0.10$)	Suported

Notes: ANG: Anger; VA: Venting; SSS: Seeking Social Support; AXT: Anxiety; PD: Psychological Distance; HPN: Happiness; TA: Task Adaption; SIS: Seeking Instrumental Support; ETM: Excitement; BI: Behavioural Intention; TU: Technology Use

Table 6.1. Hypotheses' results summary

Against to what we hypothesized, the results showed that the loss emotion studied (anger) is not directly associated with IT usage neither positively associated with seeking social. However, this loss emotion is positively associated with venting, but venting is not associated with IT use. Even though venting appears to be a scape from anger, it could also strengthen anger (Bushman, 2002). This could mean that individuals who experience venting will not use healthcare wearable devices, so they can prevent themselves from performing actions they would regret. It is important to study other loss emotions in IT implementation.

It was found that anxiety (deterrence emotion) has a multifaceted relationship with IT use. Directly, anxiety is not related to IT use. There are two types of indirect relationship. Firstly, anxiety is positively related to seeking social support, but seeking social support is not associated with IT usage. Secondly, anxiety is positively associated with psychological distancing which is negatively associated with IT usage. It is possible that a non-significant direct link between anxiety and IT use exists when individuals live in a collective environment that will counter the negative direct effect we hypothesized. This also supports the positive relationship between anger and seeking social support. The indirect negative link between anxiety and IT use through psychological distancing is in agreement with extant literature which shows that before individuals handle the problem they are facing, they need to emotionally calm down (Folkman & Lazarus, 1985).

Contrary to our expectations, excitement (challenge emotion) was found to not be directly associated with IT usage. However, research made in the past exhibited weak links between flow (another challenge emotion) and IT usage (Trevino & Webster, 1992; Webster, Trevino, & Ryan, 1993). Indirectly, excitement is positively associated with task adaption, which in turn, is not associated with IT usage. The positive link between excitement and task adaption is in accordance with the findings in psychological field, demonstrating that this challenge emotion encourages the search for solutions to difficult or complex issues, imagination, and the performance of certain tasks (Isen, Daubman, & Nowicki, 1987). However, this adaptation behaviour does not lead to IT use. The results also showed that excitement is positively associated with seeking instrumental support, which is positively associated IT usage. This positive link suggests that, by feeling excited, individuals will explore all the features of healthcare wearable devices and will learn more about the technology.

Finally, happiness (achievement emotion) is insignificant explaining IT use. Extant research show that other achievement emotions such as satisfaction are positively associated with intention to adopt, intention to use, and intention to continue to use (Chin & Gopal, 1995; Davis, Bagozzi, &

Warshaw, 1992; Bhattacherjee, 2001). It might have been a good idea to use other achievement emotion like pleasure or satisfaction since wearable devices are, in this context, self-service technologies. Event thought they both belong to the same group of emotions, individuals may not associate happiness to satisfaction. Our results also indicate that happiness is not associated with task adaption neither with seeking instrumental support, as we hypothesised.

Behavioural intention showed to be strongly and positively associated with IT use which is accordance with previous findings (Venkatesh et al., 2012). The negative emotions (anger and anxiety) do not moderate the intention to use wearable technology. This is consistent with our obtained results that studied the direct effect of these emotion on healthcare wearable technology use. As for positive emotions (happiness and excitement) both moderate the behavioural intention to IT use. Our results shows that excitement positively moderate the relationship between intention and usage, which is consistent with previous findings (Kim et al., 2004). As suggested by Scherer and Tran (2001), this type of emotions (challenge emotions) are more conducive to invest energy in activities that involve exploring the features of the technology. They also provide the impetus needed to achieve the goals associated with the behaviour. As we can conclude from Figure 4, for highly excited individuals the importance of intention behaviour to explain usage behaviour is higher and, therefore, they will use more healthcare wearable devices. This suggests that highly motivated individuals are willing to face difficulties and challenges. As consequence, they are more able to face adversities in IT use. Even though excitement does not directly impact technology use as we hypothesised, it will positively moderated the effect of behavioural intention on healthcare technology use. On the other hand, happiness negatively moderates the relationship between intention and usage. Happiness is usually described as an enjoyable state which requires little effort and that individuals have a high degree of certainty about the way the IT product fits them (Smith & Ellsworth, 1985). The Figure 4 corroborates with the definition given above. It shows that for less happy individuals the importance of intention behaviour to explain usage behaviour is higher and, as consequence, they will use wearable technology more. Since individuals are not happy, they feel they have to do something to change their state of mind (contrary to the definition of happiness). As such, the willingness to use healthcare wearable technology tends to increase.

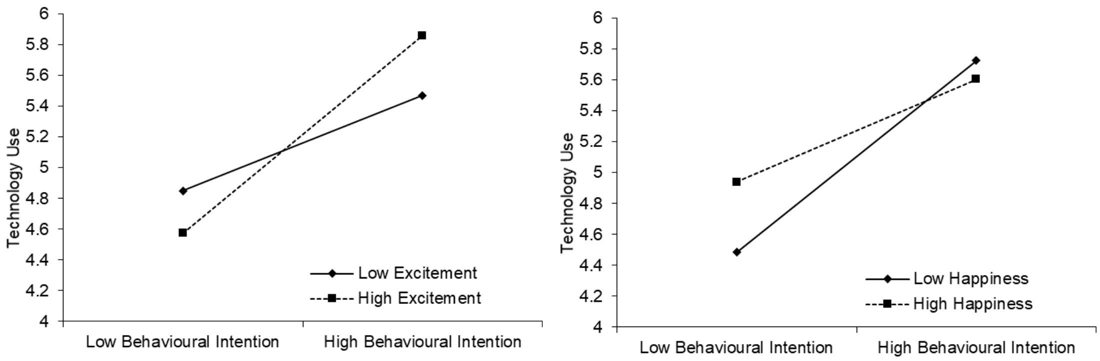


Figure 6.1. Excitement and Happiness moderating Behavioural Intention on IT Use

6.2 Managerial implications

This study shows numerous managerial implications. Both advertisers and healthcare wearable devices managers are conducted to promote better strategies and policies on adopting healthcare wearable devices. Our study suggests that marketing managers should consider various strategies for increasing actual users' continuous adoption intention and potential users' intention to use wearable devices based on emotions, since emotions are representative of consumers' feelings (Martins, Costa, Oliveira, Gonçalves, & Branco, 2018).

Marketers should incorporate specific advertisements that trigger challenge emotions (like excitement) since it is positively associated with the relationship between intention and usage of healthcare wearable technology. Even though there is a need for more research on the topic to understand the approaches that have to be made to trigger specific emotions, healthcare wearable devices managers can should insure that the healthcare wearable devices are perceived as an opportunity. As so, healthcare wearable devices managers should provide sufficient autonomy and suitable incentives for individuals to adjust their tasks.

As our results show, excitement is related to IT use through seeking instrumental support. Given this, healthcare wearable devices managers and developers should invest in a good users' manual on how to use the device, training courses to explore all the features and other support mechanisms to increase self-efficacy.

In order to decrease the frequency of loss and deterrence emotions, marketers should base their advertisements on other users' testimony on how to use healthcare wearable devices and what have they done in case of troubles. In order to users being able to share their experiences and seek for support, healthcare wearable devices managers should make online user groups available, such as forums. Creating online groups for individuals to participate may help prevent distancing, and therefore, anxiety.

6.3 Limitations and future research

There are some limitations in this research. Firstly, regarding our sample, mainly, the respondents were young (mean age of 33) and highly educated (63% has a degree or more). This tendency might be different from the population average. Usually, younger and more educated people tend to better react to more radical technology, like wearables, which might have caused some skewness to our data. In Portugal, wearable technology is mainly used for fitness purposes. The literature about wearable technology shows that this devices for fitness purposes are more likely to be used by younger individuals (Gao et al., 2015). Also, younger individuals react differently from older ones. Thus, there are future studies that can test this model in different groups of users: fitness users and medical users.

Secondly, we recognize that the geographic location limits our research, as the study was only conducted in Portugal. Future research should apply the framework for classifying emotions in other countries. The geographic location is related to culture. The culture aspect may influence different emotions and adaptation behaviours (Beaudry & Pinsonneault, 2010). For illustration, seeking social support is less likely to be accepted in individualist cultures than in group oriented ones. Also, some cultures may have more tolerance for anxiety than others. As so, the behaviours of individuals might be different from culture to culture and there is a need to exploit the role of emotions on IT behaviours in multiple cultures.

Thirdly, the aim of our study is to understand the impact of emotions on self-service technology usage. The literature regarding emotions is mainly focused on organisational context. Individuals tend to act and react differently accordingly to the environment they are in. Individuals who use technological tools for professional purposes and who are not responsible for their implementation, are likely not to worry about privacy or trust issues since they are only users. On the other hand, self-service technologies, like wearable devices, offer a high degree of uncertainty and risks to the individuals in their initial adoption. As so, trust plays a central role in determining customers' acceptance and adoption to technology. It is necessary study the role of trust and the emotions experienced during the initial impact period of adopting a self-service technology.

Finally, it would be important to combine a cognitive model like UTAUT2 with an emotion-based model. Researches made in this area show the power of cognitive-based models in explaining IT use and acceptance. However, it is also recognized the need to incorporate the psychological factor in these models, in order to get the complete individuals' behaviour toward acceptance and usage of an IT application. Therefore, it is important to wider the range of emotions studied and understand the intermediate adaption behaviours, since emotions are mainly related to IT use through this indirect relationships. In order to do so, it is necessary to understand which emotions are triggered by certain technological features.

7. CONCLUSION

The contribution of this research was to understand the direct, indirect, and moderate effect of emotions on healthcare wearable technology use. In order to do so, we proposed a model based on Beaudry & Pinsonneault (2010) framework for classifying emotions and added behavioural intention and moderators to it. This study was the first to include a full range of emotions to explain IT use on a self-service technology and to include emotions moderating the effect of behavioural intention on IT use. Based on a sample of 265 Portuguese respondents, we empirically confirmed that even though emotions are not directly related to IT use, they are associated with usage through adaptation behaviours and by moderating the effect of intention-use relationship. The model explained 51% of the variance of healthcare wearable technology use. Further research in this area is still needed to better understand adaption behaviours that trigger specific emotions related to self-service technology. There are different models that can be integrated in our research to fully understand the human behaviour towards technology acceptance. Our study helps understanding the emotional side of wearable devices usage. Other emotions, adaptation behaviours and moderators should be explored in order to expand the knowledge on this research area.

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APPENDIX A: QUESTIONNAIRE ITEMS

Construct	Code	Items	Reference
Emotional Reaction		Indicate the extent to which you experienced each of the following emotion when the introduction of healthcare wearable devices was announced:	(Beaudry & Pinsonneault, 2010)
	ANG	Anger	
	AXT	Anxiety	
	HPN	Happiness	
	ETM	Excitement	
Venting	VA1	I am angry and I tell everyone exactly what is on my mind.	(Beaudry & Pinsonneault, 2010)
	VA2	Sometimes, I loose it; I slam doors for example.	
	VA3	I take it out on my family and friends.	
Seeking Social Support	SSS1	I seek for moral support from my friends/family.	(Beaudry & Pinsonneault, 2010)
	SSS2	I talk about it with my family members.	
	SSS3	I meet with my friends/family to talk about my concerns.	
Psychological Distancing	PD1	I tell myself time will take care of it all.	(Beaudry & Pinsonneault, 2010)
	PD2 (dropped*)	I tell myself that there is nothing I can do about it.	
	PD3 (dropped*)	I try not to worry about it.	
Task Adaption	TA1	Healthcare wearable devices lead me to perform tasks that I could not do before.	(Beaudry & Pinsonneault, 2010)
	TA2	Healthcare wearable devices lead me to suggest new procedures for my tasks.	
	TA3	Healthcare wearable devices lead me to suggest new ways of doing things.	
Seeking Instrumental Support	SIS1 (dropped*)	I ask for help to my friends/family on how to use healthcare wearable devices.	(Beaudry & Pinsonneault, 2010)
	SIS2	I use the online help features.	
	SIS3	I consult the users' manual.	
	SIS4	I use different sources of research to find out how to use healthcare wearable devices.	
Behavioural Intention	BI1	I intend to continue using healthcare wearable devices in the future.	(Venkatesh et al., 2012)
	BI2	I will always try to use healthcare wearable devices in my daily life.	
	BI3	I plan to continue to use healthcare wearable devices frequently.	
Technology Use	TU1	Eu utilizo dispositivos móveis relacionados com a saúde;	(Zhou, Lu, & Wang, 2010)
	TU2	Eu utilizo dispositivos móveis relacionados com a saúde para medir sinais vitais	
	TU3	Eu utilizo dispositivos móveis relacionados com a saúde para fins de fitness (monitorização de atividades físicas)	

*The items were dropped due to its low loading

APPENDIX B: LOADINGS, CA, CR, AND AVE

Constructs	Loadings	CA	CR	AVE
Anger		1.000	1.000	1.000
ER1	1.000			
Anxiety		1.000	1.000	1.000
ER2	1.000			
Venting		0.782	0.862	0.676
VA1	0.852			
VA2	0.827			
VA3	0.786			
Seek Social Support		0.809	0.886	0.722
SSS1	0.797			
SSS2	0.858			
SSS3	0.891			
Psychological Distance		1.000	1.000	1.000
PD1	1.000			
Happiness		1.000	1.000	1.000
ER3	1.000			
Excitement		1.000	1.000	1.000
ER4	1.000			
Task Adaption		0.879	0.926	0.806
TA1	0.844			
TA2	0.929			
TA3	0.913			
Seek Instrumental Support		0.770	0.864	0.684
SIS2	0.890			
SIS3	0.663			
SIS4	0.906			
Behavioural Intention		0.932	0.957	0.881
BI1	0.940			
BI2	0.927			
BI3	0.948			
Technology Use		0.732	0.849	0.653
TU1	0.882			
TU2	0.701			
TU3	0.831			

APPENDIX C: CORRELATIONS AND SQUARE ROOTS OF AVES

	Mean	SD	ANG	AXT	VA	SSS	PD	HPN	ETM	TA	SIS	BI	TU
Anger (ANG)	1.479	1.184	**1.000**										
Anxiety (AXT)	1.868	1.286	0.330	**1.000**									
Venting (VA)	1.648	0.975	0.186	0.257	**0.822**								
Seek Social Support (SSS)	3.697	1.464	0.125	0.297	0.265	**0.850**							
Psychological Distance (PD)	3.815	1.927	0.039	0.164	0.183	0.222	**1.000**						
Happiness (HPN)	3.781	1.599	0.160	0.292	0.179	0.447	0.176	**1.000**					
Excitement (ETM)	4.792	1.628	0.105	0.240	0.161	0.472	0.282	0.713	**1.000**				
Task Adaption (TA)	4.523	1.589	-0.032	0.193	0.169	0.461	0.243	0.306	0.404	**0.898**			
Seek Instrumental Support (SIS)	4.469	1.534	0.097	0.189	0.109	0.511	0.153	0.329	0.365	0.461	**0.827**		
Behavioural Intention (BI)	5.224	1.463	-0.014	0.154	0.193	0.495	0.185	0.480	0.537	0.486	0.402	**0.939**	
Technology Use (TU)	5.188	1.456	0.035	0.112	0.082	0.452	0.056	0.408	0.430	0.443	0.451	0.645	**0.808**

APPENDIX D: LOADINGS

		AGR	AXT	VA	SSS	PD	HPN	ETM	TA	SIS	BI	TU
Anger	ER1	**1.00**	0.33	0.19	0.12	0.04	0.16	0.10	-0.03	0.10	-0.01	0.04
Anxiety	ER2	0.33	**1.00**	0.26	0.30	0.16	0.29	0.24	0.19	0.19	0.15	0.11
Venting	VA1	0.19	0.27	**0.85**	0.29	0.19	0.16	0.18	0.18	0.13	0.23	0.11
	VA2	0.15	0.18	**0.83**	0.14	0.12	0.12	0.08	0.07	0.05	0.08	0.00
	VA3	0.09	0.14	**0.79**	0.19	0.11	0.16	0.10	0.15	0.06	0.12	0.06
Seek Social Support	SSS1	0.12	0.19	0.27	**0.80**	0.19	0.36	0.35	0.34	0.42	0.34	0.33
	SSS2	0.10	0.27	0.15	**0.86**	0.22	0.37	0.45	0.45	0.47	0.48	0.44
	SSS3	0.10	0.28	0.27	**0.89**	0.15	0.41	0.39	0.37	0.41	0.42	0.36
Psychological Distance	PD1	0.04	0.16	0.18	0.22	**1.00**	0.18	0.28	0.24	0.15	0.19	0.06
Happiness	ER3	0.16	0.29	0.18	0.45	0.18	**1.00**	0.71	0.31	0.33	0.48	0.41
Excitement	ER4	0.10	0.24	0.16	0.47	0.28	0.71	**1.00**	0.40	0.37	0.54	0.43
Task Adaption	TA1	-0.03	0.14	0.18	0.35	0.18	0.23	0.33	**0.84**	0.36	0.37	0.36
	TA2	0.01	0.19	0.19	0.48	0.21	0.32	0.40	**0.93**	0.47	0.48	0.44
	TA3	-0.07	0.18	0.08	0.40	0.26	0.27	0.35	**0.92**	0.40	0.45	0.38
Seek Instrumental Support	SIS2	0.03	0.13	0.07	0.40	0.09	0.28	0.35	0.44	**0.89**	0.36	0.41
	SIS3	0.09	0.19	0.10	0.41	0.09	0.14	0.14	0.31	**0.66**	0.20	0.27
	SIS4	0.13	0.17	0.11	0.47	0.19	0.36	0.36	0.39	**0.91**	0.40	0.42
Behavioural Intention	BI1	-0.03	0.13	0.18	0.45	0.19	0.45	0.53	0.46	0.39	**0.94**	0.60
	BI2	0.02	0.18	0.21	0.49	0.15	0.45	0.48	0.45	0.36	**0.93**	0.61
	BI3	-0.03	0.12	0.15	0.45	0.18	0.45	0.50	0.46	0.38	**0.95**	0.60
Technology Use	TU1	-0.03	0.12	0.06	0.37	0.07	0.36	0.40	0.41	0.40	0.64	**0.88**
	TU2	0.11	0.08	0.13	0.39	0.03	0.36	0.28	0.31	0.32	0.40	**0.70**
	TU3	0.03	0.07	0.02	0.35	0.03	0.28	0.35	0.34	0.36	0.50	**0.83**

APPENDIX E: HTMT RATIO

	ANG	AXT	VA	SSS	PD	HPN	ETM	TA	SIS	BI	TU
Anger (ANG)											
Anxiety (AXT)	0.330										
Venting (VA)	0.192	0.265									
Seek Social Support (SSS)	0.141	0.325	0.316								
Psychological Distance (PD)	0.039	0.164	0.190	0.246							
Happiness (HPN)	0.160	0.292	0.199	0.497	0.176						
Excitement (ETM)	0.105	0.240	0.164	0.518	0.282	0.713					
Task Adaption (TA)	0.040	0.205	0.189	0.535	0.259	0.323	0.428				
Seek Instrumental Support (SIS)	0.113	0.227	0.127	0.551	0.168	0.353	0.391	0.551			
Behavioural Intention (BI)	0.032	0.159	0.200	0.533	0.192	0.497	0.556	0.533	0.454		
Technology Use (TU)	0.078	0.129	0.119	0.586	0.063	0.480	0.497	0.544	0.586	0.768	