


Universidade do Minho


# The role of Individual behavioural differences on consumer's intention to purchase online mass-customised apparel products

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*To my parents*

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"*There are times and circumstances when we want to be noticed and to have our sense of individuality publicity acknowledged: when goodies and gold stars are being passed out, when we are "into" our hero thing, or when we want to connect with some special other person on a deeper level.*

*But we don't step forward for life's shit details or want to go it alone through uncertain or dangerous terrain or call attention to our vulnerabilities when "evil eyes" are squinting.*

*And then are nights when we want to suspend our conscience on the Golden Rule hanger and get down to the usually inhibited pleasures of acting out primitive impulses.*

*Then we declare our sameness to the other animals of appetite rather than our uniqueness among the angels of reason"*

Philip G. Zimbardo

# Resumo

O comércio eletrónico tem experienciado na última década um crescimento sem precedentes, e o vestuário tem sido uma das categorias de produtos mais dinâmicas no mercado online. Apesar do significativo crescimento da investigação neste domínio, existem ainda questões pouco exploradas, principalmente relacionadas com as características individuais de comportamento do consumidor associadas à customização em massa de vestuário online.

A definição do objetivo deste estudo foi alicerçada numa revisão de literatura detalhada, e consiste em compreender o papel das características de personalidade - *desejo por produtos únicos, necessidade de toque, envolvimento com o vestuário,* e de duas novas características propostas (*necessidade de simplicidade e necessidade de realidade)* na *intenção de compra online de produtos de vestuário customizado.*

A investigação realizada usa como estrutura conceptual a hierarquia de características (*elemental, compound, situational, surface traits*) do modelo meta-teórico da motivação e personalidade (3M), que até à data ainda não foi usada no estudo do impacto das características de personalidade em diferentes níveis, na intenção de compra online de produtos de vestuário customizado.

Foi usada uma abordagem baseada em equações estruturais para representar as relações entre as variáveis, resultando num conjunto de 24 hipóteses. Os dados foram recolhidos através de um questionário online a uma amostra não probabilística e de conveniência. Tendo em conta os objetivos do estudo, foram só considerados os respondentes que já compraram vestuário online e aqueles que não tendo comprado demonstraram intenções de fazê-lo no futuro próximo. Deste modo, foram obtidos 840 questionários válidos para análise. Os procedimentos de análise dos dados incluíram análises descritivas, modelação através da técnica "Partial Least Squares Path Modelling*" (PLS-Path)* e regressão hierárquica.

Dos resultados obtidos ressalta que o "surface trait*" - intenção de compra online de vestuário customizado* - é principalmente determinado pelos "situational traits*" – desejo por produtos únicos, envolvimento com o vestuário, necessidade de toque e necessidade de simplicidade*. Os "compound traits*" - sentido de singularidade*, *necessidade de conhecimento* e *necessidade de avaliar* - e também os "elemental traits" - abertura à experiencia, extroversão, instabilidade emocional, necessidade de recursos materiais e necessidade de estímulos - revelaram ser antecedentes dos "situational traits", no entanto carecem de capacidade preditiva do "surface trait*" intenção de compra online de vestuário customizado*.

Esta tese também propõe e testa duas novas características de personalidade, *necessidade de simplicidade* e *necessidade de realidade*, uma das quais revelou problemas de validade e fiabilidade, tendo por isso sido excluída. Não obstante este resultado o trabalho desenvolvido constitui um ponto de partida para futuras investigações e discussões. Nomeadamente, a opção pela estrutura conceptual aplicada, que demonstrou ser útil para o estudo do comportamento

do consumidor e que representa uma ampliação do conhecimento sobre as relações entre as várias características de personalidade no contexto da customização online de vestuário. O trabalho desenvolvido apresenta igualmente contribuições teóricas relevantes para o conhecimento do comportamento do consumidor online de produtos de vestuário customizado, que podem ser aproveitadas igualmente pela indústria.

# Palavras-chave

Comportamento do consumidor, Personalidade, Customização em massa, Vestuário, Comércio online

# Abstract

Electronic commerce of apparel products has experienced unprecedented growing in the last decade and is considered a major category in the online market. Despite the significant bulk of research in this domain, there are still issues barely explored related to the consumer Individual behavioural differences specifically associated with online apparel mass-customisation.

Supported by a detailed literature review, the main purpose of this study was to understand the roles of personality traits - *desire for unique products*, *need for touch, apparel involvement* and two new proposed traits (*need for simplicity* and *need for reality)* on *intention to purchase online mass-customised apparel products*.

The investigation uses as conceptual framework the hierarchy of traits from the meta-theoretical model of motivation and personality (3M) that, to the best of our knowledge has never been applied to explore how traits in different hierarchical levels impact on the intention to purchase online mass-customised apparel products.

A structured equation modelling approach was selected to represent the relationships among the constructs, which resulted on a set of 24 hypotheses that were then tested using a quantitative approach. The empirical data was collected through a self-administered online questionnaire directed to a non-probabilistic convenience sample. Considering the purpose of the study, were only considered respondents who have already bought apparel online and those who have not yet bought, but are considering it in the near future, resulting in 840 valid questionnaires retained for further analysis. Data analysis procedures employed include descriptive statistics, Partial Least Squares-Path Modelling technique and hierarchical regression.

Major findings indicate that the surface trait - *intention to purchase online mass-customised products* (first level) - is mostly determined by situational traits (second level traits) - *desire for unique products*, *apparel involvement*, *need for touch* and *need for simplicity*. Compound traits (third level traits) - *sense of uniqueness*, *need for cognition* and *need to evaluate* - and elemental traits (fourth level traits) - *openness to experience*, *extraversion*, *neuroticism*, *need for material resources* and *need for arousal* - were found to be positive predictors of situational traits, but lacks explanatory power on the surface trait - *intention to purchase online mass-customised apparel products*.

Furthermore, in this thesis two new personal traits, *need for simplicity* and *need for reality* were proposed and tested. *Need for reality* was dropped out the model, due to validity and reliability issues, however, this study provides a relevant starting-point for further research and discussion. Moreover, the framework applied has proven to be useful in improving knowledge about the relationships within personal traits in the context of online apparel mass-customisation.

The theoretical contributions of this study are expected to extend the knowledge regarding online apparel mass-customisation consumer behaviour. Practical implications are presented and discussed and future research directions are detailed.

# Keywords

Consumer Behaviour, Individual Behaviour differences, Personal Traits, Mass-customisation, Online commerce, Apparel products

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# List of Abbreviations

| | |
|---|---|
| AVE | Average Variance Extracted |
| BCA | Bias-Corrected and Accelerated |
| CB-SEM | Covariance-based Structural Equation Modelling |
| CR | Composite Reliability |
| DUCP | Desire for Unique Consumer Products Scale |
| M | Mean |
| NFC | Need for cognition |
| NFR | Need for reality |
| NFS | Need for simplicity |
| NFT | Need for touch |
| NFU | Need for Uniqueness |
| NTE | Need to evaluate |
| NTI | Need for tactile input |
| OLS | Ordinary Least Squares |
| OSL | Optimum Stimulation Level |
| PLS-SEM | Partial Least Squares - Structural Equation Modelling |
| PSU | Personal Sense of Uniqueness Scale |
| SD | Standard Deviation |
| SEM | Structural Equation Modelling |
| SOU | Sense of uniqueness |
| SPSS | Statistical Package for the Social Sciences |
| TAM | Technology Acceptance Model |
| TPB | Theory of Planned Behaviour |
| TRA | Theory of Reasoned Action |
| VIF | Variance Inflation Factor |

# Chapter 1 Introduction

## 1.1 Overview

Many companies are adopting multichannel strategies in order to be able to access new markets by extending the product offer and attract new segments of customers (Konus, Verhoef, & Neslin, 2008). Multichannel strategies are more evident in companies with brick-and-mortar stores, that moved to the online environment, using the Internet to complement physical stores and better address all different consumers' needs in order to promote customer satisfaction and loyalty (Zhang et al., 2010).

Burt and Sparks (2003) point a scenario where physical stores act as a marketing medium to promote excitement and interest through human interaction, but where the final purchase order is done online. However, the consumer decision making process is far more complex and is the result of several components, not only channel properties (e.g. ease of use, accessibility), but also the product itself (e.g. complexity, product risk), consumer characteristics ( e.g. socio-demographics, lifestyle), retailer characteristics (e.g. trust, reputation), and situational factors ( e.g. weather, mood) (Broekhuizen, 2006). Nonetheless, in a wide perspective, choice is based on consumer's evaluation of positive and negative attributes, or risks and benefits of a channel (Lu, Cao, Wang, & Yang, 2011; Pookulangara, Hawley, & Xiao, 2011).

In the case of apparel products, brick and mortar stores are the most attractive channel due to the experiential nature of the product. Through this channel it is possible to have physical contact with the products, touch fabrics, try on and evaluate all apparel attributes (Demangeot & Broderick, 2007), interact and socialize with staff and other clients/friends, take advantage of the atmospherics (S. A. Eroglu, Machleit, & Davis, 2001; Koufaris, Kambil, & Labarbera, 2002) and of brand tangible devices (Rose, Hair, & Clark, 2011). However, other characteristics are less attractive when compared to others channels. Physical stores are not open 24 hours, it is necessary to walk to the store, it is more difficult to find a specific product, it is impossible to compare products or prices, and for some consumers the pressure from salespeople is seen as something negative, leading to a reduction of the time spent in the store (Goldsmith & Flynn, 2005; Schoenbachler & Gordon, 2002).

Catalogues, contrary to traditional retail, are more convenient since shopping can be done anywhere, there is no time pressure, presents variety and a range of products sometimes difficult to find in traditional stores (Goldsmith & Flynn, 2005). But it presents also some negative aspects related to the impossibility to have a direct experience with the product, lack of social and personal contact with pears or salespersons, along with delayed gratification (Rajamma, Paswan, & Ganesh, 2007).

When compared to catalogues, online shopping reveals many similarities, and they are probably the channels more alike (Merrilees & Fenech, 2007). Like catalogues, the main advantages of online shopping are the ability to shop anywhere at any time, the capacity to provide higher levels of non-sensorial information (e.g. garment care, fabric characteristics, use information) and being easier to compare products features (Oh, Fiorito, Cho, & Hofacker, 2008; Shim, Eastlick, Lotz, & Warrington, 2001). Similar to catalogues, online shopping encounters some disadvantages or risks. Considering the disadvantages of the online channel, some online retailers are adopting new strategies and investing in new technologies. Mass-customisation has been one of these strategies that makes use of information technologies as internet (Fogliatto, da Silveira, & Borenstein, 2012; Helms, Ahmadi, Jih, & Ettkin, 2008). With online mass-customisation consumers can actively participate in the process of product development, co-design or fit customisation, and create customised products according to their needs and desires (Broekhuizen & Alsem, 2002; Fiore, Lee, & Kunz, 2004). Several industries (e.g. automobile, electronic, furniture) have already applied this strategy (Fogliatto et al., 2012), but the apparel sector has an enormous potential due to the specific products characteristics such as: versatility, modularity and self-expression (Anderson-Connell, Ulrich, & Brannon, 2002).

In 2010 the Nielsen Company, concluded in the "Global trends in online shopping" report (Nielsen, 2010), that clothing, accessories and shoes gather 36% of purchase intentions, right after books (with 44%), and had grown 20% from 2009. In 2012 a study from eMarketer (eMarketer, 2012) predicted a 20% growth in clothing and accessories sales comparing to 2011 with expected sales of 55.1 million Euros in 2016. Already in 2015, a new report showed that clothing and accessories had generated sales of 52.2 billion U.S. dollars in 2014 and it is predicted to reach 86.4 billion by 2018 (eMarketer, 2015).

Concerning apparel customisation, in 2012 Walcher and Piller (2012), conducted a benchmark study on 500 companies pursuing mass-customisation within eleven categories. "*Personalised Fashion & Textiles*" appear as the second dominating category (15.6%), after "*Personalised Media"* (19.2%), reinforcing the adequacy of online mass-customisation to the apparel industry. A European Commission Report (Observatory, 2013) stated the importance of customised apparel, which is expected to be worth EUR 27.2 billion by 2020, corresponding to 5% of the global clothing industry. These values revealed the market of customised apparel as a niche market (Observatory, 2013), although, with the evolution of technologies (e.g. 3D virtual visualisation, digital printing, 3D printing) and the overcoming of millennials, named *"the most digitally connected generation in history"* (Heller, 2016) which crave for personalised and unique features, it is expected that customisation will grow in the near future.

Thus, the recognition and growing of the use of the online channel as an actual alternative or a complement to brick-and-mortar stores along with the increasing potential of apparel mass-customisation, are the main drivers of this study.

## 1.2 Purpose of the study

In the literature review *"The mass-customisation decade: An updated review of the literature"* conducted by Fogliatto et al. (2012), it is stated that current research has adopted mainly a company perspective on the applications, economics, success factors, and enablers for effective implementation of mass-customisation. Topics related to the consumer focused the shift from a company centric approach to a customer centric approach or customer demand (Fogliatto et al., 2012), leaving aside questions related to effective adoption of mass-customisation from the customer perspective, namely topics related to consumer behaviour. Consumer behaviour involves interdependent factors from different fields such as marketing, psychology, sociology, economy and information systems (S. M. Lee & Chen, 2010) and in a broad view can be internal: demographics, psychographics, personality motivation, knowledge, attitudes, beliefs and feelings; or external: derived from product features and web experience.

In the case of apparel mass-customisation a significant amount of research has been conducted on these internal and external factors (e.g. S. Cho & Workman, 2011; Fiore et al., 2004; Hansen & Jensen, 2009; Jansson-Boyd, 2011; H.-H. Lee & Chang, 2011), but there is still a need for empirical research examining the role of individual characteristics on intentions to purchase online mass-customised apparel products. Research on individual characteristics is of major interest when concerning apparel, due to the role of this product category in the individual's life. Indeed, apparel comprises a determinant role in presenting ourselves to the world (Calefato, 2004; Entwistle, 2000) by reflecting the social status, and individual/psychological characteristics of the self (M.-J. Kim, 2007). In fact, apparel products are associated to the creation and expression of personal identity (Goldsmith, 2002), that allow the individual expression of the real self (who am I), the ideal self (who I want to be) and the social self (how I want others to see me) (Malhotra, 1988; Schreier, 2006). Sometimes apparel even becomes part of the extended self, if it plays a dominant role in an individual's identity and definition of himself (Belk, 1988; Mittal, 2006). In general, apparel products have an identity expression role, but mass-customised products are closer interrelated to the individual (Schreier, 2006). Customised products become part of the extended self, they are perceived as part of the creator, due to the process of creation that demands investments of physical energy, time and effort (Belk, 1988).

Given the importance of apparel, the growing of apparel online commerce and the use of a mass-customisation strategy, the main purpose of this study is to contribute to the literature by examining the role of consumer personal traits as determinants of intention to purchase online mass-customised apparel products.

## 1.3 Research Question and Objectives

The importance of research on online consumer behaviour is undeniable. Consumer related characteristics, such as demographic variables or perceptions, have been frequently investigated, but personality related variables, like traits have been under-investigated (Cheung, Chan, & Limayem, 2005; N. Li & Zhang, 2002), especially on the study of online consumer behaviour of mass-customised products (Fogliatto et al., 2012).

By reviewing relevant literature on online apparel mass-customisation, the characteristics of the product and consumer experience, five personal characteristics were found to be especially relevant to predict intention to purchase online mass-customised apparel products: *need for touch*, *desire for unique products*, *need for reality*, *need for simplicity* and *apparel involvement*. These traits will be considered as the narrowest traits with direct effect on intentions.

In addition, past research has employed as theoretical foundation the attitudinal theories (S. M. Lee & Chen, 2010), like the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), the Theory of Planned Behaviour (TPB) (Ajzen, 1991) and the Technology Acceptance Model (TAM) (F. D. Davis, 1989), among others, such as the channel theory, theory of status consumption and expectation-disconfirmation theory (e.g. H. Cho & Wang, 2010; Kang & Kim, 2012; E.-J. Lee & Park, 2009; H.-H. Lee & Chang, 2011; J. Park, Han, & Park, 2013). In the current study the meta-theoretical model of motivation and personality (3M) (Mowen, 2000) and its hierarchy of traits, which to the best of our knowledge has never been applied to the context of online apparel mass-customisation, is proposed as theoretical framework. Personality studies based on traits have been helpful to examine consumer behaviour because of its enduring properties. Despite some criticism on the small amounts of variance accounted by personality traits for behaviour prediction, especially concerning broad traits as the Big 5 (Kassarjian & Sheffet, 1991), the study of traits from a hierarchical approach has revealed the possibility to use traits to effectively predict behaviour (Mowen, 2000; Mowen & Spears, 1999). Studying consumer behaviour from a different perspective and applying a distinct framework it is expected that new knowledge could be generated and added to the existent literature.

In this context, the main aim of the current study is to answer the following research question:

How individual behavioural differences on *desire for unique products*, *need for touch*, *need for simplicity*, *need for reality* and *apparel involvement*, affect consumer's *intention to purchase online mass-customised apparel products*?

In particular, this research has several specific objectives:

1) Analyse and identify the most relevant consumer traits to explain online purchase behaviour of mass-customised apparel products;

*2)* Propose and empirically test the application of an hierarchical structure of traits approach, based on the Meta-Theoretic Model of Motivation and Personality (3M), (Mowen, 2000), to explain intention to purchase online mass-customised apparel products;

3) Test the relationship between *desire for unique products* and *need for touch* on the context of online apparel mass-customisation, which, to the best of our knowledge, only have been approached independently in online apparel shopping and in mass-customisation contexts, but never together;

*4)* Propose and test two new consumer constructs, grounded on aspects of online apparel mass-customisation experience, *need for simplicity* and *need for reality*, and its relationship with the *intention to purchase online mass-customised apparel products*;

5) Reflect on the findings of the study, discussing theoretical contributions and practical implications;

6) Highlight new opportunities for future research.

## 1.4 Thesis Outline

Chapter one provides an initial background and justifies the need for the current research. It specifies the importance of the topic, research gaps and consequently research questions. The outline of the thesis is also presented.

Chapter two provides the theoretical foundations for the present study. It starts by reviewing the application of the mass-customisation strategy in apparel industry. Next, characteristics of mass-customised apparel products and consumer experience are presented. Personality theories, with focus on trait theories applied to consumer behaviour research are also object of analysis, to justify the decision to follow a trait approach in the current study. Additionally, the application of hierarchical models of traits to study intentions to purchase online mass-customised apparel products are assessed.

Building on the literature review presented in chapter two, chapter three presents the target constructs, the conceptual model and the research hypotheses. A definition of each construct is given as well as a justification of how it is positioned in the model.

Chapter four describes the methodology used for conducting the research. It presents the operationalization of the constructs used, the method and further details on how the data was collected. It also includes a description of the procedures used in data analysis.

In chapter five the analysis of data and interpretation of the data reported and model assessment and estimation are discussed. First, a descriptive analysis is provided, followed by the analysis of the measurement and structural model.

Finally, chapter six discusses the findings of the study, presenting the theoretical contributions and practical implications. Also, several limitations are identified and suggestions for future research are made.

In addition, this thesis includes several appendices with information regarding the scales, the questionnaire template as well as auxiliary information concerning the data analysis.

# Chapter 2 Literature Review

## 2.1 Introduction

This chapter revises the literature on online consumer behaviour toward apparel mass-customisation apparel products. Firstly, it presents a concise description of what apparel mass-customisation is and its base concepts. Next, the characteristics of apparel mass-customised products and of the consumer online experience, relevant for the purposes of the study, are reviewed. Finally, since the focus of the research will be consumer individual behavioural differences, namely individual traits, a review of trait theories and models is also presented.

## 2.2 Apparel mass-customisation process, product and consumer experience

### 2.2.1 Apparel mass-customisation

The mass-customisation concept first appears with Stanley Davis in 1987 in the book "*Future Perfect"* when he stated that *"the same large number of customers can be reached as in mass markets of the industrial economy, and simultaneously they can be treated individually as in the customised markets of pre-industrial economies*" (S. M. Davis, 1996, p. 177). Later, Pine II (1993, p.24) define the concept of mass-customisation as *"developing, producing, marketing and delivering affordable goods, and services with enough variety and customisation that nearly everyone finds exactly what they want"*.

Mass-customisation is a strategy based on a closer relationship between consumers and producers/companies, focusing on the consumers' needs and desires (Piller, 2004). Customisation can take place at various levels depending where customers are involved in the product cycle, design, fabrication, assembly or use (Duray, Ward, Milligan, & Berry, 2000; Senanayake & Little, 2010) (Figure 1).

The two most common types of apparel mass-customisation are the customisation of design/co-design and the customisation of fit/made-to-measure, which can occur between "DESIGN" *and* "FABRICATION", since the customer do not have fully design autonomy (Bae & May-Plumlee, 2005; Senanayake & Little, 2010).

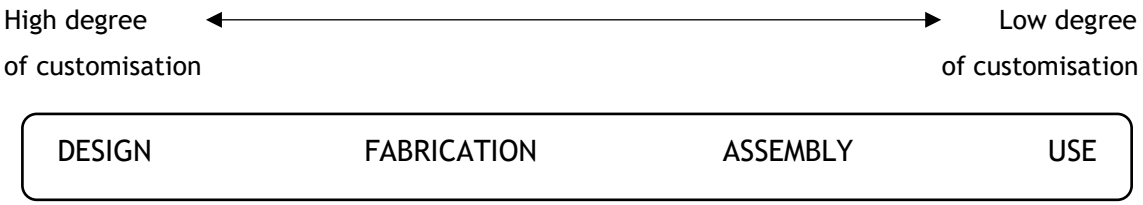


Figure 1 Levels of customisation and points of customer involvement (Duray et al., 2000)

Customisation of design/co-design, allows consumers to be part of the development process by defining, designing, matching, or modifying product features, by combining a set of pre-defined choices and components (Miceli, Ricotta, & Costabile, 2007; Piller, Schubert, Koch, & Moslein, 2004).

Customisation of fit/made-to-measure allow consumers to acquire made to measure apparel, where the fit and tailoring is done according to body measures (Piller & Müller, 2004). Boër and Dulio (2007) define fit customisation as the perceived comfort for the consumer with tailor made clothes based on the individual's morphological data, similar to what happened before industrialisation and mass production.

## 2.2.2 Characteristics of online mass-customised apparel products

Co-design and made-to-measure apparel have one thing in common, they are unique. The distinctiveness provided by mass-customisation is an attractive factor for consumers driven by high need for distinction/uniqueness (Franke & Schreier, 2008; Ulrich, Anderson-Connell, & Wu, 2003).

Since the development of the uniqueness theory by Snyder and Fromkin (1980), apparel products are referred as one of the commodities which allow the expression of uniqueness: "(…) *when two people wear an identical suit or dress to the same social event, the resulting negative reactions provide anecdotal support for the important relationship between clothing and the self-perception of uniqueness. (…) enhanced valuation of clothing occurs when people become potential possessors of apparel that is unavailable to many other people*" (Snyder & Fromkin, 1980, p. 118,119). Adopt new apparel products or brands, seek for non-traditional and self-differentiating apparel, scarce, limited versions or customised, are common behaviours in the search for uniqueness (Burns, 1993; Burns & Brady, 1992; Snyder, 1992).

On the relationship between customisation and the need for uniqueness, Latter, Phau, and Marchegiani (2010) studied mass-customisation in apparel luxury brands and found that uniqueness was a significant predictor of purchase intentions. Similarly, Kang and Kim (2012)

and J. Park et al. (2013) found that consumers with high need for uniqueness exhibit higher purchase intention towards e-customised apparel through positive attitude and subjective norm, which is consistent with the Theory of Reasoned Action (TRA). Halepete, Littrell, and Park (2009) found those consumers who express high need for uniqueness and positive attitudes toward customisation, give less importance to the social or financial risks involved.

Previous findings seem to support the importance of the relationship between the creation of unique products through customisation, the individual's need for uniqueness and the intention to purchase customised products.

Consumer's pursuing the fulfilment of their sense of uniqueness through online apparel mass-customisation, co-designed or made-to-measure, have the opportunity to participate in the design process. Yet, despite all the choices and decisions made, the whole process takes place without physical contact with the initial product components or the final outcome.

Consumers evaluate apparel products according to physical characteristics, that is to say texture/fabrics and proportions/fit, but also by the sensory and emotional responses these attributes trigger (Klerk & Lubbe, 2008). By its characteristics, apparel is, in general, a high experiential product, extremely reliant on senses, namely the sense of touch (Yoh, Damhorst, Sapp, & Laczniak, 2003; Zhou, Dai, & Zhang, 2007). In general consumers prefer to shop from channels where products can be touched, especially in the case of apparel products (S. Cho & Workman, 2011; Grohmann, Spangenberg, & Sprott, 2007). The lack of possibility to touch apparel products play a decisive role in consumer behaviour and, for some authors (e.g. J. Cho, 2004; Levin, Levin, & Heath, 2003; Zhou et al., 2007), is considered a key element to the adoption of non-touch channels, as is the case of the online channel, since it can have repercussion in consumers' capacity and confidence to judge these products (Peck & Childers, 2003b) .

Studies on this subject, report that consumers tend to consider a product as a high-risk product when they cannot touch or try it before purchase (Lim, 2003), which has an especially negative impact on the online purchase of apparel products (Almousa, 2011). In the case of online mass-customisation of apparel products, previous work has not examined the importance of *need for touch*. Logically, one might expect a similar negative influence on purchase intention, since mass-customised apparel products are in their essence apparel products.

Along with the impossibility to touch mass-customised apparel products, consumers are also faced with the problem of not having a real product representation since these products are developed virtually. In this context it is important to consider the concept of intangibility, which has mainly been developed and used in service marketing studies. Kotler and Bloom (1984, p. 147) defined intangibility as "*what cannot be seen, tasted felted, heard or smelled*". The concept of intangibility was in the beginning defined by two dimensions (Breivik, Troye, & Olsson, 1999):

1. physically intangible (inaccessibility to the senses) and;

2. generality intangibility (the more general an attribute, the more difficult is to evaluate).

Later Laroche, Bergeron, and Goutaland (2001) proposed that intangibility was not a two dimensional construct, but composed by a third dimension: mental intangibility. The new dimension represents the difficulty to visualize a particular product/service, "*reflects the fact that a good can be physically tangible, but difficult to grasp mentally*." (Laroche, McDougall, Bergeron, & Yang, 2004, p. 374).

In general, mental intangible products are more difficult to evaluate, leading to higher levels of uncertainty and perceived risk. In most cases, mental intangibility has a higher negative impact on purchasing behaviour than physical intangibility, especially if there is no prior product knowledge and the consumer lacks the capacity to "see it" (Laroche, Yang, McDougall, & Bergeron, 2005). The Internet, a channel perceived usually as intangible, can be helpful to reduce product intangibility allowing a clear mental representation, by providing product evaluation through informativeness, effectiveness and entertainment (Mazaheri, Richard, Laroche, & Ueltschy, 2014). While the Internet is expected to be useful to reduce product mental intangibility, in the case of mass-customised products this outcome might not be achievable. Moon and Lee (2015) in the first study to date relating online mass-customisation and the concepts of intangibility, found that some consumers have difficulties to visualise customisation outcomes. Consumers with high mental intangibility, perceived high risk in mass-customised products and found the experience less usefulness and less enjoyable. These consumers with high mental intangibility also report lower intention to use mass-customisation.

In summary, according to the research conducted mass-customised apparel products are products built by the consumer from a set of choices, are unique, non-touchable and intangible in the moment of conception.

Along with mass-customised products characteristics, to better understand online consumer behaviour toward mass-customised apparel products, is essential to reflect on the characteristics of the customisation experience.

### 2.2.3 Mass-customisation experience

The mass-customisation experience is essentially an online experience supported by the use of toolkits, also named configurators or design kits, which are mechanisms or design interfaces that enables the consumer to collaborate with the company and have a self-designed product (Franke & Piller, 2003; Franke, Schreier, & Kaiser, 2010). With the use of toolkits, consumers are able to define, configure, match, or modify the components and options offered, in order to create an individual solution according to their needs, wants or tastes.

Companies pursuing customisation have developed and employed different configurators according to the type of product and the level of customisation. According to Dellaert and Stremersch (2005) the differences of configurators are expressed on:

a) the extent of mass-customisation (number of modules options);
b) the heterogeneity in the levels available for a mass-customisation module (offer similar or different options of the same module);
c) the individual (differentiated) pricing of modules;
d) and the presence and level of a default version[1].

The number of options or modules will reflect the number of products set available. In general, the more the number of options offered, the more likely is that the consumer finds what he/she wants. Positive evaluations, attitudes and enjoyment have been reported as derived from having more variety available (Dellaert & Dabholkar, 2009; H.-H. Lee, Damhorst, Campbell, Loker, & Parsons, 2011; Piller, Schubert, Koch, & Möslein, 2005).

However, all these choices and possibilities can lead to what has been named as "mass confusion", which reflects the overall negative consequences derived from information overload and excess of variety (Matzler, Stieger, & Füller, 2011; Piller et al., 2004), namely on consumer's intention to use mass-customisation platforms (Dellaert & Dabholkar, 2009).

In fact, several researchers (e.g. Huffman & Kahn, 1998; Moser, Muller, & Piller, 2006; Piller et al., 2004) found that exposure to too many choices has repercussions in cognitive evaluation, resulting in confusion, indecision, frustration, dissatisfaction and in non-purchasing behaviour.

The mass-customisation experience besides being supported by toolkits is, globally, an online shopping experience. The "*web experience*" is a combination of functionality, information, stimulation and emotions, build upon functionality factors (e.g. usability and interactivity), psychological factors ( e.g. trust ) and content factors ( e.g. aesthetics and marketing mix) (Constantinides, 2004). Rose et al. (2011) named it "*Online consumer experience*" (OCE), an experience with both cognitive and affective states, derived from information processing, perceived ease of use, perceived usefulness, perceived benefits, perceived control, skills, trust propensity, perceived risk and also enjoyment.

The truth is that shopping goes much beyond the simple acquisition of products and services (Demangeot & Broderick, 2007). The utilitarian function is still one of the major drivers of shopping, but the hedonic aspect of consumption is growing in importance. Consumers do not only look for a product, but also expect to have a pleasant shopping experience.

The web experience and its utilitarian and hedonic characteristics, are dependent of the technologies employed. The literature on online shopping experience (e.g. Chang, Cheung, &

[1] have or not an option of pre selection; offer a higher or low cost or quality option, without the consumer have to pass through all selection stages (Dellaert & Stremersch, 2005)

Lai, 2005; Chung & Park, 2009; Darley, Blankson, & Luethge, 2010; Dennis, Merrilees, Jayawardhena, & Wright, 2009; Rose et al., 2011) has addressed some technological aspects, ranging from the web-site quality and satisfaction, web-atmospherics, interactivity, image interactivity, image stimulus, to aesthetics and consumer's sensory and emotional experience.

In the case of the mass-customisation experience, image interactive technologies have a decisive role (Fiore et al., 2004). Image interactive technologies can be defined as the ability to create and manipulate images of a product or environment on a website (Fiore, Jin, & Kim, 2005; Fiore, Kim, & Lee, 2005) through 2D and 3D images, zoom, rotation, try-on in avatars models with similar consumer physical characteristics, interaction with other consumers, rating apparel products bought, real time chats with salespersons and other customisation services (Darley et al., 2010; S. A. Eroglu et al., 2001; Goldsmith & Goldsmith, 2002; Merle, Senecal, & St-Onge, 2012; J. H. Park & Stoel, 2002; Song, Fiore, & Park, 2007).

Image manipulation technologies have evolved in the last years and started to be applied more heavily in apparel online shopping and in mass-customisation online, specially 3D virtual try-on and avatars (virtual reality), webcam simulators (augmented reality) and 3D body scan.

Some questions have been studied considering the level of reality simulation and the relation with self-congruity, self-esteem and consequences on attitudes and purchasing behaviour. For example Merle et al. (2012) found that with the use of personalized 3D virtual try-on, consumers perceived more utilitarian value and present higher purchase intention. Other study by Suh, Kim, and Suh (2011) show how consumers form attitudes regarding avatars in realist, task-focused virtual world setting. The self-concept (body and face similarity) was found to have a positive effect on avatar identification in terms of self-congruity, influencing emotional attachment and improving the evaluation of online apparel.

Retailers are applying the available technological features to deliver a more interactive and complete shopping experience to consumers (Tuunainen & Rossi, 2002), however, these technologies still represent a challenge due to apparel products characteristics and consumers individual differences on realism perception (Chittaro & Corvaglia, 2003; Keckeisen, Stoev, Feurer, & Straber, 2003).

In the case of apparel, the diversity of styles, colours, fabric choices and other attributes can be indeed overwhelmed (Kang & Kim, 2012). In terms of the process, customisation, co-design or made-to-measure, requires a certain number of steps to successfully complete the order.

Whilst it is recognised that the simplification of the process and the reduction of the number of options to a reasonable set are key success factors for mass-customisation implementation (Observatory, 2013), few studies considered the relationship between consumer's individual characteristics and perceived complexity. Some of those studies correlate complexity with the lack of capability of consumers to define their preferences correctly (e.g. Kang & Kim, 2012; Miceli et al., 2007) while others (e.g. Huffman & Kahn, 1998; Moon & Lee, 2014) found that complexity can be reduced if consumer learn about their preferences. In fact, preferences,

product knowledge and previous experiences seem to be related to perceived complexity, since evidences point that consumers that are able to better express their preferences tend to perceive less complexity when confronted with many choices and show a more positive attitude toward mass-customisation (Moon & Lee, 2014; Moon, Lee, & Chang, 2013). Piller, Schubert, Koch and Möslein (2005) and Dellaert and Stremersch (2005) found that knowledge plays a decisive role in dealing with task complexity and consequently less confusion when confronted with a plethora of choices. H. Cho (2007) and Matzler et al. (2011) show evidences on how fashion involvement and previous experience with mass-customisation influence the perception of confusion and complexity and affect the utility of the mass-customisation process. Figure 2 offers a visual representation of the different factors affecting complexity.

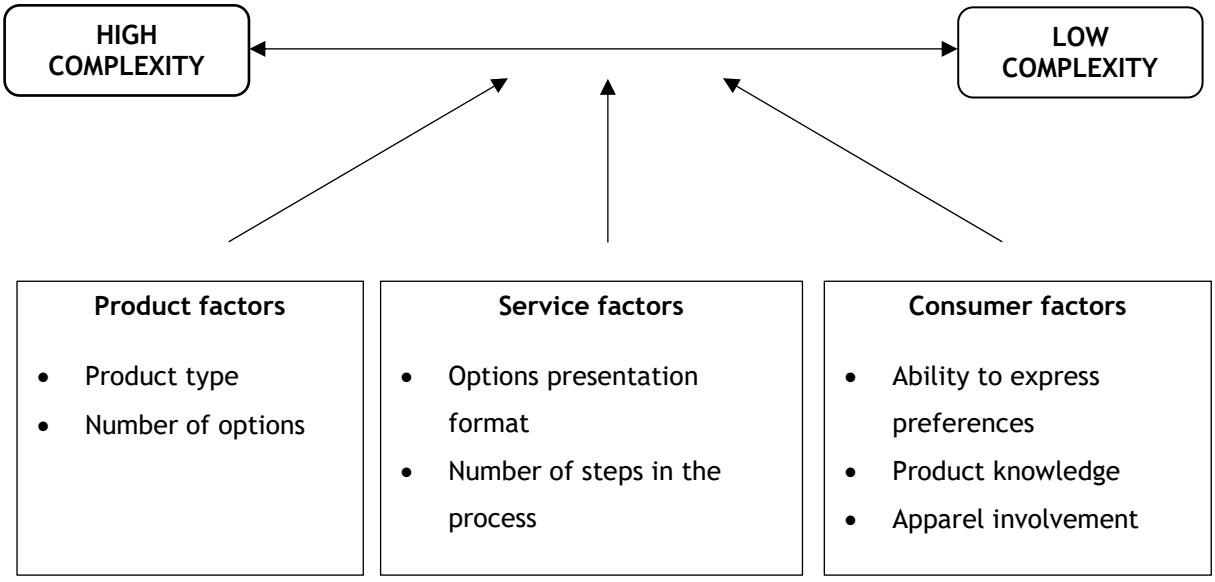


Figure 2 Factors influencing the level of perception of complexity on online Apparel mass-customisation (Adapted from Moon et al. (2013))

To this far, the review has outlined the need for further research on individual's characteristics following Dellaert and Stremersch (2005) understanding that research based on improving the knowledge on consumer individual traits can help to better explain the customisation web experience and the adoption of mass-customisation by consumers.

## 2.3 Consumer factors and online apparel mass-customisation

The first studies regarding mass-customisation focus mainly on management and production aspects, or structural implementation problems (e.g. Kotha, 1995; Pine II, Victor, & Boynton, 1993), but in the last decade research has shifted to consumer-related aspects.

A review was conducted on consumer aspects related to attitudes and intentions to use mass-customisation or purchase mass-customised products, revealing that almost all the studies are somewhat concerned with the product and the experience, since these are the essential components to provide value to the potential consumers of mass-customisation (Fiore, Lee, Kunz, & Campell, 2001).

### 2.3.1 Consumer experience perceptions and expectations

Consumer perception refers to "*what happens when consumers are exposed to, attend to, and comprehend stimuli in the environment*" (Mowen & Minor, 1997, p. 60). In the review conducted, it was found that the majority of studies draw up on consumer's perceptions about the experience of mass-customisation and the mass-customised product.

Perceived ease of use, perceived usefulness, perceived control and perceived enjoyment were the factors more addressed, and in general were found to have significant and positive effect on attitudes and intention to use online apparel mass-customisation (H. Cho & Fiorito, 2009; H. Cho & Wang, 2010; Dellaert & Dabholkar, 2009; H.-H. Lee & Chang, 2011; Moon & Lee, 2014; Wang & Liu, 2009; Wu, Kang, Damminga, Kim, & Johnson, 2015).

In terms of product, perceptions about the product outcome and the preference fit were found to have a significant effect on intentions to use online apparel mass-customisation (Dellaert & Dabholkar, 2009; Moon & Lee, 2014). Other perceptions, namely about risk, security and social aspects were also approached in several studies (H. Cho & Fiorito, 2009; H. Cho & Wang, 2010; Kang & Kim, 2012; Moon & Lee, 2015; J. Park et al., 2013; Wu et al., 2015) with significant direct or indirect effect on attitudes and intentions toward online apparel mass-customisation.

Along with perceptions, expectations also plays a relevant role in consumer behaviour prediction (Mowen & Minor, 1997). Expectations are a person's beliefs about what happen in a given situation, and influence the comprehension and interpretation of information (Woodruff, Cadotte, & Jenkins, 1983). Expectations on the mass-customisation process, namely the disconfirmation of expectations (experience better than expectations) was found to positively predict satisfaction with the customisation process/experience (Kamali & Loker, 2002; M. Lee, Shi, Cheung, Lim, & Sia, 2011). A summary of the reviewed studies and their major findings are presented in Table 1 according to experience, product, risk and trust beliefs and social factors.

Table 1 The effects of consumer experience perceptions and expectations on attitudes toward online apparel mass-customisation and intentions to purchase mass-customised apparel products

| Factors | Studies | Major findings |
|---|---|---|
| **Experience** | | |
| Web skills<br>"*users' own judgment about their ability as it relates to computer skills to complete online shopping.*" (H.-H. Lee & Chang, 2011, p. 180) | H.-H. Lee and Chang (2011) | Positive effect on perceived ease of use and enjoyment; Positive effect on attitudes toward online mass-customisation |
| Perceived usefulness<br>''*the degree to which a person believes that using a particular system would enhance his or her job performance*'' (F. D. Davis, 1989, p. 320) | Wang and Liu (2009) | Positive correlated with attitude toward the acceptance of online customisation |
| | H. Cho and Fiorito (2009) | Direct and strong influence on attitude toward online apparel mass-customisation |
| | H. Cho and Wang (2010) | Perceived usefulness effect on attitude toward online apparel mass-customisation was significant in both cultures, but the effect was stronger in the USA than in Taiwan |
| | H.-H. Lee and Chang (2011) | Predictor of consumer attitudes toward online mass-customisation |
| | Wu et al. (2015) | Not significant in predicting subjects' attitude towards their co-design experience or behavioural intention towards the mass-customisation site |
| Perceived ease of use<br>''*the degree to which a person believes that using a particular system would be free of effort*'' (F. D. Davis, 1989, p. 320) | Wang and Liu (2009) | Positive correlated with attitude toward acceptance of online customisation |
| | H. Cho and Fiorito (2009) | Indirect effect on attitude toward online apparel mass-customisation, mediated by perceived usefulness and trust |
| | H. Cho and Wang (2010) | Positive and significant effect on attitude toward online apparel mass-customisation in Taiwan, but not in the USA |
| | H.-H. Lee and Chang (2011) | No significant effect on consumer attitudes toward online mass-customisation |

| Factors | Studies | Major findings |
|---|---|---|
| | Wu et al. (2015) | Significantly predicted subjects' attitude towards the co-design experience |
| Perceived Control<br>*"the extent to which consumers believe they are able to determine the outcome of the mass-customisation process"* (Dellaert & Dabholkar, 2009, p. 46) | Dellaert and Dabholkar (2009) | Positive effect on intention to use mass-customisation |
| | H.-H. Lee and Chang (2011) | High perceived control lead to positive attitudes toward online mass-customisation |
| | Kang and Kim (2012) | No significant influence on purchase intention towards online mass-customised apparel |
| | Moon and Lee (2014) | Significant predictor of intentions to use online mass-customisation |
| Perceived Enjoyment using online mass-customisation<br>*''consumer's perception of the pleasure associated with the experience of using on-line mass customisation"*<br>(Dellaert & Dabholkar, 2009, p. 46) | Dellaert and Dabholkar (2009) | Positive effect on intention to use online apparel mass-customisation |
| | H.-H. Lee and Chang (2011) | Positive effect on attitudes toward online apparel mass-customisation |
| | Moon and Lee (2015) | Significant effect on intention toward online mass-customisation, but affect by perceived risk |
| | Wu et al. (2015) | Positively predicts attitude towards the co-design experience |
| Perceived Complexity<br>*"consumer's perception of how complicated it is to use on-line mass customisation"* (Dellaert & Dabholkar, 2009, p. 45) | Dellaert and Dabholkar (2009)<br>Moon et al. (2013) | Significant negative effect on intention to use mass-customisation, when mediated by perceived control |
| Perceived Performance of mass-customised web site<br>*"subjective evaluation of performance made by an individual after a good or service has been used"* (H.-H. Lee et al., 2011, p. 318) | H.-H. Lee et al. (2011) | Predicted by the range of options<br>Positive perceived performance of web site leads to positive evaluations of the mass-customisation process |
| Expectations to the mass-customisation process<br>*"what consumers expects in the process as well as how they evaluate their participation in customizing apparel products"* (H.-H. Lee et al., 2011, p. 317) | H.-H. Lee et al. (2011) | Not significant relation with satisfaction with the mass-customisation process |

| Factors | Studies | Major findings |
|---|---|---|
| Satisfaction with customisation process<br>*"a positive function of consumer expectations or pre-purchase beliefs"* (H.-H. Lee et al., 2011, p. 318) | Kamali and Loker (2002) | Satisfaction increase with higher levels of design involvement in the customisation process |
| | H.-H. Lee et al. (2011) | Site performance and disconfirmation of expectations (experience better than expectations) positively predict satisfaction with the customisation process<br>Higher satisfaction positively predicts behavioural consequences |
| Willingness to spend more time on co-design | Choy and Loker (2004) | Direct effect on willingness to purchase mass-customised products |
| Willingness to pay more for co-design | Choy and Loker (2004) | Direct effect on willingness to purchase mass-customised products |
| **Product** | | |
| Product outcome<br>*"consumer's perception of the total value of the product that can be achieved by choosing product module levels according to the consumer's own specifications"* (Dellaert & Dabholkar, 2009, p. 45) | Dellaert and Dabholkar (2009) | Positive effect on intentions to use apparel mass-customisation |
| Preference fit<br>*"fit between their preferences for unique products and the attributes of customised offerings"* (Moon & Lee, 2014, p. 125) | Moon and Lee (2014) | Significant indirect effect on intention to use online apparel mass-customisation |
| **Risk and trust beliefs** | | |
| Perceived risk<br>*"consumer's subjective perception of expected loss from purchasing"* (H.-H. Lee & Moon, 2015, p. 117) | J. Park et al. (2013) | Individuals who perceive high risk are more likely to depend on psychological needs when forming attitudes toward online mass-customised products |
| | Moon and Lee (2015) | Indirect effect on intention toward mass-customisation web sites, mediated by perceived usefulness and perceived enjoyment |

| Factors | Studies | Major findings |
|---|---|---|
| Perceived Security<br>"*the extent to which a user believes that using a particular application will be risk free*" (Fang, Chan, Brzezinski, & Xu, 2006, p. 130) | H. Cho and Fiorito (2009)<br>H. Cho and Wang (2010) | Positive influence on trust |
| Trust<br>"*the level of expectation or degree of certainty in the reliability and truth or honesty of a person or thing*" (Chow & Holden, 1997, p. 282) | H. Cho and Fiorito (2009)<br>H. Cho and Wang (2010) | Direct and strong influence on attitude toward online apparel mass-customisation |
| **Social factor** | | |
| Subjective Norm<br>"*consumer's perception of social pressures placed on him or her by others*" (Ajzen, 1991, p. 1999) | Kang and Kim (2012) | Significant effect on purchase intentions toward mass-customised apparel |
| | Wu et al. (2015) | Positively predicted subjects' behavioural intention toward mass-customisation |

### 2.3.2 Personal traits

Despite being commonly accepted that personal traits influence online purchasing behaviour, few studies have addressed personal traits as determinants of attitudes or intention to purchase online apparel mass-customised products. Indeed, only seven personal characteristics were found addressing online apparel mass-customisation, optimum stimulation level (Fiore et al., 2004, 2001), involvement (H.-H. Lee & Chang, 2011; Moon & Lee, 2014; Moon et al., 2013; Ulrich et al., 2003; Wang & Liu, 2009), innovativeness (Ulrich et al., 2003; Wang & Liu, 2009), need for uniqueness (Kang & Kim, 2012; J. Park et al., 2013), ability to express preferences (Moon & Lee, 2014), status aspiration (J. Park et al., 2013) and general and mental intangibility (Moon & Lee, 2015). Apparel involvement and need for uniqueness were the traits found to be more relevant. Consumers highly involved with apparel and with high desire for uniqueness expressed more positive attitudes toward online apparel mass customisation and high purchase intention. Table 2 provides a summary of personal traits studied in the context of online apparel mass customisation and the major findings.

The previous studies provided significant insights on consumer intentions to use online apparel mass-customisation, the perceptions on benefits and cost as well on personal individual characteristics. The study of these consumer-related factors has been generally supported by well-established theories, which will be further identified.

Table 2 The effects of personal traits on attitudes toward online mass-customisation and intentions to purchase mass-customised products

| Traits | Studies | Major findings |
|---|---|---|
| **Optimum stimulation level(OSL)**<br>"*individual's preferred level of environmental stimulation*" (Mehrabian & Russel, 1974, p. 42) | Fiore et al. (2001)<br>Fiore et al. (2004) | High OSL individuals consider co-design as an exciting experience to acquire unique products, which entails a higher commitment to use mass-customisation |
| **Involvement**<br>"*A person's perceived relevance of the object based on inherent needs, values, and interests*" (Zaichkowsky, 1985, p. 342) | Ulrich et al. (2003) | The level of consumer involvement was not significant correlated with co-design process comfort |
| | Wang and Liu (2009) | High fashion involved individuals have a more positive attitude toward mass-customisation and have high behavioural intentions to use mass-customisation |
| | H.-H. Lee and Chang (2011) | Moderates the relationship between perceived usefulness and attitudes toward online mass-customisation |
| | Moon et al. (2013)<br>Moon and Lee (2014) | Positive predictor of ability to express preferences and preference fit<br>Significant indirect effect on perceived control |
| **Innovativeness**<br>"*the degree to which an individual is relatively earlier in adopting innovations with respect to others in the social system*" (Hurt, Joseph, & Cook, 1977, p. 59) | Ulrich et al. (2003) | Positive correlation between the subscale of innovativeness (Hurt et al., 1977)"ambiguities and problems" and comfort with co-design; Individuals who like to solve problems feel more comfortable with the co-design process |
| | Wang and Liu (2009) | Moderates the effect of individual's attitudes and intentions<br>The higher the level of innovativeness, more positive the relationship between attitudes toward acceptance of online customisation and behavioural intentions to use |

| Traits | Studies | Major findings |
|---|---|---|
| **Status aspiration**<br>"*individual characteristic reflecting the desire for dominance and leader-ship in social hierarchies by normally possessing and obtaining particular products to convey social status*" (Dawson & Cavell, 1987, p. 487) | J. Park et al. (2013) | Low influence on individual's attitudes toward online mass-customised products |
| **General and mental intangibility**<br>"*customer's difficulty in precisely defining or describing a particular good*"<br>"*a particular product can be physically tangible but difficult to visualize and grasp mentally*" (Laroche et al., 2001, p. 28) | Moon and Lee (2015) | General and mental intangibility have a significant and positive effect on perceived risk and on online mass-customisation<br>Individuals with high mental intangibility perceive higher risk, low perceived usefulness and enjoyment and display low intention to use online mass-customisation |
| **Need for uniqueness**<br>"*the trait of pursuing differences relative to others through the acquisition, utilization, and disposition of consumer goods for the purpose of developing and enhancing one's self-image and social image*" (Tian, Bearden, & Hunter, 2001, p. 52) | Kang and Kim (2012) | Significant influence on attitudes and perceived behavioural control<br>Individuals with high need for uniqueness have high purchase intention of online mass-customised apparel products, through positive attitudes |
| | J. Park et al. (2013) | Individuals with high need for uniqueness have high purchase intention of online mass-customised apparel products, through positive attitude and subjective norm |
| **Ability to express preferences**<br>*"how well consumers perceive and clarify their preferences"* | Moon and Lee (2014) | Significant indirect effect on attitudes, perceived control and intention to use online apparel mass-customisation |

## 2.4 Theories on consumer's attitudes, behaviour, and adoption of apparel mass-customisation

The overall consumer behaviour is a multidisciplinary and complex phenomenon, that no theory or model can completely explain (E. Eroglu, 2014). In spite of that, some theories have been dominant in the attempt to explain consumer behaviour and intentions in the online mass-customisation environment, such as the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) and related theories on attitudes, including the Theory of Planned Behaviour (TPB) (Ajzen, 1991) and the Technology Acceptance Model (TAM) (F. D. Davis, 1989). Although the majority of studies applied TAM and TPB, other theories, such as the channel theory, theory of status consumption and expectation-disconfirmation theory have also been used as theoretical foundation for many studies. Table 3 presents an inventory of the studies applying each theory in the context of apparel mass-customisation.

Table 3 Theories and models

| **Theories/models** | **Studies applying it** |
|---|---|
| Technology Acceptance Model (TAM)<br>(F. D. Davis, 1989) | Ulrich et al. (2003)<br>Wang & Liu (2009)<br>H. Cho & Fiorito (2009)<br>H. Cho & Wang (2010)<br>H.-H. Lee & Chang (2011)<br>Wu et al. (2015) |
| Theory of Planned Behaviour (TPB)<br>(Ajzen, 1991) | Kang & Kim (2012)<br>Moon & Lee (2014) |
| Channel Theory<br>(H. Li, Kuo, & Rusell, 1999) | Kamali & Loker (2002) |
| Expectation-disconfirmation theory<br>(Oliver, 1980) | H.-H. Lee et al. (2011) |
| Consumer innovation adoption model<br>(Gatignon & Robertson, 1985) based on the Innovation Diffusion Theory (Rogers, 1995) | J. Park et al. (2013) |
| Model of the intangibility of e-services<br>(Featherman & Wells, 2010) | Moon & Lee (2015) |

Since it is commonly assumed that no theory can completely explain consumer behaviour, the current study, seeking for a different approach to the explanation of consumer behaviour in online market for customised apparel, proposes a theoretical foundation based on personality

theories, namely traits theory, using the meta-theoretical model of motivation and personality (3M) as the operative framework for the implementation of the study.

## 2.5 Personality theories

The study of personality in social sciences, primarily in consumer behaviour, has been one the topics which has generated more research along the years (Bosnjak, Bratko, Galesic, & Tuten, 2007; Kassarjian & Sheffet, 1991). According to Kassarjian (1971) almost everything in the study of consumer behaviour is somewhat related to personality, from purchase behaviour, product choice, innovation, risk taking, to attitudes change.

The psychoanalytic theories, such as Freudian theory that considered the unconscious needs or drives as essential to human motivation, has led marketers to explore the unconscious, symbols and fantasies to develop promotion techniques. Likewise, the clinical methods of therapy applied by psychoanalytic (having the patients on a couch, relax and talk) were translated to depth interviews and focus groups techniques still used nowadays (Mowen & Minor, 1997). On the other hand, humanistic theories with the study of humans needs, such as Abraham Maslow's (Maslow, 1943) humanistic theory of personality, approached the study of personality by paying attention on subjective experiences, free will, and the innate drive toward self-actualization, which has been extremely relevant to study consumerism (Buss & Poley, 1976).

Another theory that relates personality and consumer research is the trait theory, which unlike the psychoanalytic or humanistic theories, considers that each individual has a unique personality formed by the interaction of different traits and that those can be used to measure behaviour trough statistics (Mowen & Minor, 1997). Buss and Poley (1976) reflect on the beginning of the study of personality traits, which goes back to the nineteen century, led by social forces, namely capitalism, where quantification and measurement of salaries, prices, profits and markets turn to be a major concern. While everything turned to be measured, why not measure and quantify the man itself. As this new society emerged, the need for specialization of work forces begins to be a pre-requisite, thus individual differences helped to catalogue persons to different social and economic functions. Along with society development, through the twenty century, new markets, new tendencies and new technologies emerge, and the importance of traits and individual differences became of major importance in consumer behaviour study (Buss & Poley, 1976).

The characteristics of personality, as a reflection of individual differences allows to find similar personality traits in different consumers, and provide the basis for consumer segmentation, which can be used to adjust or develop products according to a specific market and to consumer's needs, or even to enhance promotional techniques (Carson, Gosling, & Durant, 2013; Goldsmith, 2002; Kassarjian & Sheffet, 1991). Despite the fact that personality may change as the individual grows or as a result of specific major life events, the study of

personality can be helpful to predict consumer behaviour over time due to its consistency and enduring nature.

### 2.5.1 Trait theories

The emergence of a trait psychology, namely the study of individual differences began with Francis Galton with his publication "*Measurement of character*" (Galton, 1884). Along with his studies on personality and individual differences, he made several major contributions for the modern study of traits through the development of statistical procedures to describe variation in traits between individuals. Francis Galton introduced the concept of correlation coefficient and regression toward the mean, sideways with the development of a correlation index to describe the relationship between two variables, which was later refined by Karl Pearson (Buss & Poley, 1976). Despite Galton's early studies, the development of a trait perspective is attributed by some authors (e.g. Hall & Lindzey, 1978) to Gordon Allport. Allport (1927) contributes to the development of a new theory by considering individual uniqueness and intra-individual personality, placing traits on the centre of personality research. Traits are currently considered the basic units of analysis for discussing individual differences. In general traits can be defined as a broad and stable disposition that lead behaviour in a certain way in a variety of situations, although they can change over time and show some degree of situational specificity (Cloninger, 2004; Pervin, 1994).

Nowadays, the study of traits has gain some autonomy. Developments related to the integration of a mathematical approach to traditional psychological problems, specifically factor analysis, make a more objective approach in the identification of a trait possible. Traits are no longer only dependent variables under personality theories and arbitrary choices from the theorist to classify behaviour (Cloninger, 2004).

Overall, trait theories are based on some assumptions (Buss & Poley, 1976), namely:

- A trait is derived from various influences, but biological factors as genetics are the basis of differences in personality; with this approach the individual can be expressed in terms of temperament, ability and motivation;
- A trait emerges early in the individual's life to provide effective mental abilities, motivation, temperament, maturation and to behaviour complexity organization;
- A trait is considered the basic unit of analysis, what does not mean that the analysis cannot be broad or restricted to specific behaviours, for example as in the study of individual differences in traits;
- Traits can be studied as dependent, moderator or independent variables. Traits as dependent variables are useful for personality assessment, whereas as independent

variables are more appropriated to realize the role of dispositional constructs face to an important behaviour;

- The theory of traits is the one that gives more emphasis to psychological measurement; from a trait perspective, the majority of aspects of personality can be quantified.

Among trait theories is possible to find different views regarding some aspects. Ontologically traits can be positioned in three different ways (Zuroff, 1986):

- A first position is related to genetics, that is, traits exist naturally in every single individual; this is a causal view of traits supported by explanatory purposes based on genetics and also related to believes in heritability of traits;

- A second position considers traits only attributes that do not imply genetic origin, because they are only descriptive of an explicit behaviour. This is a summary view that only describes and categorizes behaviour;

- A third broad position is related to the relation between traits and environment. Traits can generate different behaviour's according to the environments in which they occur; according to a specific environment various traits can be active. This dispositional view is linked to behaviour prediction by correlating environment and traits.

Over the years, the use of traits to predict behaviour has been under some criticism, because in most empirical studies the amount of variance explained by the Big Five (the dimensions of Big 5 personality theory model: extraversion, agreeableness, neuroticism, conscientiousness and openness to experience) was small (Cloninger, 2004; Kassarjian, 1971). Others have conducted domain specific studies, developing more narrow traits leading to numerous scales to emerge (Kassarjian & Sheffet, 1991). Both approaches have been criticised, and some authors proposed to study traits hierarchically, testing different levels of traits. For example Allport (1961) proposes a classification of traits in three levels (cardinal, central and secondary) according to the degree to which they pervade behaviour. Later Lastovicka (1982) follows Allport's three levels classification and introduces lifestyle traits in the hierarchy. Mowen & Spears (1999) also supported on Allport's hierarchical viewpoint, proposed a framework including cardinal, central and surface traits, where central traits are the result of a combination of multiple cardinal traits and surface were the result of the combination of cardinal and central traits. More recently Mowen (2000) proposes a comprehensive theoretical framework to study the impact of personality on consumer behaviour, and developed the 3M Model- Meta-theoretical model of Motivation and Personality which integrates the hierarchical perspective on personality traits, the control theory and evolutionary psychology. Mowen's (2000) model proposes a hierarchy with four levels: elemental, compound, situational and surface traits (Bosnjak, Galesic, & Tuten, 2007; Chen, 2011; Mowen, 2000).

The present research will theoretically follow the hierarchical view of traits to study the consumer behaviour in online apparel mass-customisation. The study of the role of traits in the context of consumer behaviour requires that the traits are selected by their relevance to the product category and to the specific context of the investigation (Goldsmith, 2002). A set of specific traits were chosen due to their relevance to the product category and the marketing context, which will be further examined in chapter 3 in order to develop the foundations for the proposed research model and hypotheses.

# Chapter 3 Conceptual framework and Hypotheses

## 3.1 Introduction

As stated before, Mowen's (2000) hierarchy of traits from the Meta-Theoretic Model of Motivation and Personality (3M) will be used as the framework to study traits in online apparel mass-customisation context.

Since Mowen's (2000) meta-theory proposal, several studies have already employed the Meta-Theoretic Model of Motivation and Personality with success, showing that the model can be applied in a wide range of contexts such as: job performance (Licata, Mowen, Harris, & Brown, 2003), visual aesthetics (Mowen, Fang, & Scott, 2010a), word-of-mouth communications (Mowen, Park, & Zablah, 2007), gambling (Mowen, Fang, & Scott, 2009), voluntary work (Mowen & Sujan, 2005), tourism (Schneider & Vogt, 2012) and also online shopping (Bosnjak, Galesic, et al., 2007; Chen, 2011). In fact, the 3M model was validated in 17 studies, and usually accounts for high levels of variance in behavioural tendencies, ranging from 28% in bargaining proneness, to 62 % in sports participation behaviour (Mowen, 2000).

The hierarchical approach of the 3M meta-theoretical model provides an organizational structure to understand the relationships between several personality constructs within four levels, elemental (level IV), compound (III level), situational (level II) and surface (I level). The interaction between the different levels is operated from broad traits (e.g. elemental) to narrow ones (e.g. surface), each one of them explaining variance in behaviour prediction. The assumption of the feedback loop derived from control theory, advocate that the relations between traits can be nonlinear, for example an elemental trait can directly affect surface traits.

The conceptualization proposed in the current thesis advocates that the surface trait intention to purchase online mass-customised apparel products is influenced by the situational traits, *desire for unique products*, *need for touch*, *need for simplicity*, *need for reality* and *apparel involvement*. Situational traits are further influenced by compound traits, including the *sense of uniqueness*, *need to evaluate* and *need for cognition*. Compound traits are then influenced by elemental traits, *openness to experience*, *extraversion*, *neuroticism*, *need for material resources* and *need for arousal* (Figure 3).

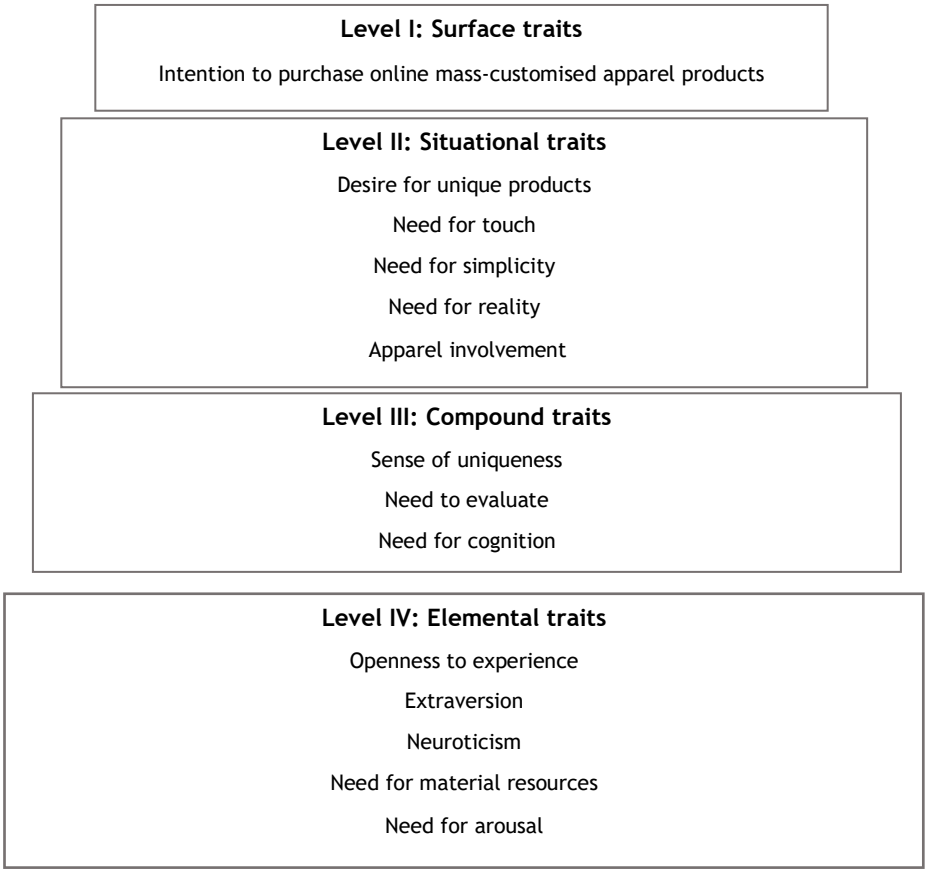


Figure 3 Conceptual Model Intention to purchase online mass-customised apparel products

## 3.2 Constructs and hypotheses

### 3.2.1 Surface traits

Surface traits are considered the immediate determinants of behaviour and are defined as enduring tendencies to act with respect to categories of products or a specific domain of behaviour. Surface traits exist in the narrowest level of the hierarchy of traits, resulting from the interaction between elemental, compound, and situational traits, as well as from the context specific environment variables (Mowen, 2000).

**Intention to purchase online mass-customised apparel products**

*Intention to purchase online mass-customised apparel products* is defined as the immediate precedent of the actual purchase behaviour, signalling the desire and the individual's

willingness to purchase. Fishbein and Ajzen (1975), stated that a behavioural intention refers to *"(…) a person's subjective probability that he will perform some behaviour"* (Fishbein & Ajzen, 1975, p. 288), thus, behaviour is determined by the intention to perform it, the stronger the intention, the higher the probability to perform the behaviour (Ajzen, 1991).

Several studies on online consumer behaviour toward mass-customisation (e.g. H. Cho & Fiorito, 2009; Kang & Kim, 2012; E.-J. Lee & Park, 2009; Moon & Lee, 2014) followed attitudinal theories (e.g. TPB, TRA), considering intentions to be preceded by attitudes, and consequently addressing factors that affect attitudes toward mass-customisation. In fact, attitude has been shown to be an important antecedent of behavioural intention (Ajzen, 1991; Ajzen & Madden, 1986; Fishbein & Ajzen, 1975) based on the premise that if an individual has the intention to act in a certain way it is because he/she has a positive attitude toward the behaviour or its outcomes. However, the effect of attitude can be weakened by several factors, namely the target object at which the behaviour is directed, the situation and time in which the behaviour is to be performed (Fishbein & Ajzen, 1975).

The present research does not directly assess attitudes, and similar to other previous studies on mass-customisation consumer behaviour (e.g. Choy & Loker, 2004; Dellaert & Dabholkar, 2009; Fiore et al., 2004, 2001; Ulrich et al., 2003) proposes a set of other factors as antecedents of intentions, specifically the situational traits: *desire for unique products*, *need for touch*, *need for simplicity*, *need for reality* and *apparel involvement*.

### 3.2.2 Situational traits

Situational traits are considered predispositions to behave within a specific context and act as motives for engaging in behaviour. These traits exist at the second level of the hierarchy, and are influenced by elemental and compound traits and the specific context and task definition (Mowen, 2000).

In the present research, five situational traits that assess a behavioural disposition to act within the situational context of online customised apparel shopping are investigated: (1) *desire for unique products*, (2) *need for touch*, (3) *need for simplicity*, (4) *need for reality* and (5) *apparel involvement*. These five situational traits were selected as a result of the associations drawn from the previous research, reviewed in Chapter 2.

**Need for touch**

*Need for touch* is defined as "(…) *as a preference for the extraction and utilization of information obtained through the haptic system*." (Peck & Childers, 2003a, p. 431)

Since early age the sense of touch is used to explore and evaluate the surroundings, and the interaction with the environment is a prominent influence on individuals' judgements (Jansson-Boyd, 2011). Differences exist among situations and products that may motivate consumers to want to touch a product before purchase (Peck & Childers, 2003a). In the case of apparel products, touch is one of the most important senses since it allows textile perception by evaluating the weigh, hardness and roughness of products (Grohmann et al., 2007; Pensé-Lhéritier, Guilabert, Bueno, Sahnoun, & Renner, 2006). Thus, the impossibility to touch an apparel product can affect judgement, conviction and decision making, especially in online environments (Peck & Childers, 2003b; Peck & Wiggins, 2006).

Along with the product category, there are differences in consumer's preference and need to use the sense of touch to evaluate products. Individuals high on *need for touch* rely more on physical evaluations to decision making and have been found to be more reluctant to online shopping. Contrary, low need for touch individuals have more confidence on their judgement capacity, and are able to make a purchase decision relying on their haptic memory (S. Cho & Workman, 2011; Grohmann et al., 2007; Peck & Johnson, 2011).

These evidences on the relationship between online apparel shopping and *need for touch*, suggest that would be an interesting advance to test the influence of *need for touch* in the online mass-customisation context. Moreover, as in the case of regular apparel shopping, is expected need for touch to affect negatively the intention to purchase online mass-customised apparel products.

H1: *Need for touch* has a negative effect on *intention to purchase online mass-customised apparel products*

**Desire for unique products**

The *desire for unique products* is a goal-oriented individual difference variable defined as the extent to which individuals "(…) *hold as a personal goal the acquisition and possession of consumer goods, services, and experiences that few others possess*" (Lynn & Harris, 1997b, p. 602).

The Uniqueness theory claims that people are motivated to maintain a sense of specialness as they define themselves on various self-related dimensions relative to others. It is a way to express their personality and avoid the unpleasant effect of being extreme similar or dissimilar (Snyder & Fromkin, 1980). The *desire for unique products* is a manifestation of the consumer need for uniqueness, which can be reflected on the acquisition of apparel goods.

Apparel mass-customisation fulfils the desire for unique products more completely that common apparel products for itself, so it is expected to be more attractive to consumers who present higher levels of *desire for unique products*.

H2: *Desire for unique products* has a positive effect on the *intention to purchase online mass-customised apparel products*

Although the lack of tactile input can be a major barrier to online apparel shopping, the characteristics of mass-customisation, like the opportunity to acquire a unique piece of clothing, can be extremely attractive even for consumers with high *need for touch*. Thus, it is hypothesized that the *desire for unique products* moderates the effect of *Need for touch* on *intention to purchase online mass-customised apparel products*.

H2a: *Desire for unique products* will moderate the negative effect of n*eed for touch* on the *intention to purchase online mass-customised apparel products*

**Need for simplicity**

In the present study, it is proposed the existence of a new construct named *need for simplicity*, which is conceptualised as an individual difference in the preference for simplicity versus complexity in multi choice environments/products.

Simplicity can be seen as a lack of obstruction which leads users to be able to get what they came for, achieving a maximum of results with the available resources (Karvonen, 2000; Trier & Richter, 2013). Thus, simplicity or the opposite – complexity - is primarily a psychological experience, an interception between the task and the person's characteristics (Campbell, 1988). This definition is directly connected with structure, organization, usability and usefulness (Choi & Lee, 2012; Moshagen & Thielsch, 2010; Schmidt, Liu, & Sridharan, 2009; Thüring & Mahlke, 2007). Consumers can experience confusion or complexity in certain environments (Huffman & Kahn, 1998), especially in mass-customisation where, usually, an extensive variety of options is presented. Managing the number of options is sometimes difficult because extensive consumer information may be necessary to provide individualized offerings, since more variety signifies that the consumer has more probability to find what he/she wants. The fact is that the correct level of choices can vary and is dependent of individual's characteristics and mental capabilities (Loranger, 2015).

Higher complexity can be inferred from the number of cognitive steps in the product creation and is linked to the cognitive effort and mental investment involved in decision make (H. Cho, 2007; Dellaert & Dabholkar, 2009). For some consumers the increase of complexity lead to higher levels of challenge and activation, but the increased levels of complexity can also lead to an overload and exceed individual's capabilities to respond (Wood, 1986).

Thus, based on the existence of psychological differences regarding information processing and cognitive structures, this study proposes that individual differences exist in the *need for simplicity* regarding online apparel mass-customisation. High need for simplicity individuals are expected to be driven by the simplicity of the product options and/or process, and will react positively to low number of choices, quantity of information and number of steps to complete the task.

However, considering that mass-customisation is by its nature a more complex shopping process than a regular clothing shopping, it is expected that *need for simplicity* will have a negative effect on *intention to purchase online mass-customised apparel products*.

H3: *Need for simplicity* has a negative effect on *intention to purchase online mass-customised apparel products*

**Need for reality**

The *need for reality* is proposed as a new construct, defined as an individual difference in consumer's appraisal and response to the realism of online virtual representations of apparel products.

In mass-customised products technologies play a crucial role, since the products that are created online, according to consumers' choices, have only a virtual existence. In this field, the integration of interactive technology, such as 3D clothing simulation and virtual try-on, has been crucial. These technologies provide a shopping experience more similar to real shopping in brick and mortar stores, through virtual experiences by facilitating products' evaluation, compensate the absence of tactile information, improve memory of association and increase purchase information (Merle et al., 2012). Realism is related to how the stimulus successful recreates real conditions which allow the consumer to perceive himself, or other people or objects as if they were physically presented in a "real" environment (Mantovani & Riva, 1999).

Thus, based in psychological differences of how individuals react to virtual stimulus, in this study it is proposed that individual differences exist in consumer's desire for the virtual experience to be as close as possible to reality. Consumer's high in *need for reality* have difficulty to visualizing virtual products as real ones, and require higher levels of stimulation and information. Conversely, consumer's low in *need for reality*, need a smaller amount of stimulation and information to form a clear visualization of what a virtual product looks like in reality.

Consequently, it is expected that *Need for reality* would directly impact the *intention to purchase online mass-customised apparel products*.

H4: *Need for reality* has a negative effect on *intention to purchase online mass-customised apparel products*

**Apparel involvement**

Involvement can be categorized as: situational (mental state of temporary interest or concern), responsive (mediate information search) or enduring (the degree of psychological connection between the individual and the stimulus object) (Michaelidou & Dibb, 2006). For the purposes of this study it will be considered the enduring involvement facet, which goes in line with O'Cass (2000, p.550) definition, " *(…) the extent to which the consumer views the focal object as a central part of their life, a meaningful and engaging object in their life and important to them*".

Consumers who experience high levels of enduring involvement with apparel are more likely to seek new and different fashion styles, and to place greater importance on personal appearance, clothing design, and the enjoyment on trying cloth (Halepete et al., 2009). So, it is hypothesized that consumers with high levels of involvement with apparel, are more likely to have a higher intention to purchase online mass-customised apparel products.

H5: *Apparel involvement* has a positive effect on *intention to purchase online mass-customised apparel products*

Huffman and Kahn (1998) found that when consumers have knowledge on product attributes the perceived complexity is reduced. Because higher levels of involvement are associated with more knowledge and experience (O'Cass, 2004; Zinkhan & Braunsberger, 2004), it is expected that confronted high levels of complexity (common associated with mass-customisation experience), consumers more involved with apparel are more likely to find online apparel mass-customisation a value experience. Consequently, it is hypothesised that *apparel involvement* moderates the relationship between *need for simplicity* and intention to purchase online mass-customised apparel products.

H5a: *Apparel involvement* will moderate the negative effect of *need for simplicity* on *intention to purchase online mass-customised apparel products*

The *need for reality* is also expected to be affected by the level of *apparel involvement*. Individuals who lack knowledge, experience and are less involved may experience uncertainty regarding the use of online apparel customisation. On the contrary, those more familiar and

experienced with the product category are expected to more easily form a clear mental representation of how the apparel is in reality (Laroche et al., 2005).

H5b: *Apparel involvement* will moderate the negative effect of *need for reality* on *intention to purchase online mass-customised apparel products*

## 3.2.3 Compound traits

Compound traits are traits that result from external influences, as culture and the personal learning history, and also from the interaction with elemental traits. The compound traits are similar to elemental traits but narrower in application (Mowen, 2000).

In the book where the 3M is proposed, Mowen (2000) investigated several compound traits, such as: task orientation, the need for learning, competitiveness, the need for activity, the need for play, and effectance motivation. However, contrary to elemental traits, a delimitation of a specific group of compound traits does not exist. Moreover, those traits considered by Mowen (2000) and others, have already been studied, as: altruism, present time orientation (Mowen & Sujan, 2005), self-efficacy (Mowen, Harris, & Bone, 2004), *need to evaluate* (Bosnjak, Galesic, et al., 2007), need for uniqueness, liberal values, conservative values, science Value (Mowen, Fang, & Scott, 2010b), need to belong and dispositional trust (Sun & Wu, 2012).

Based upon a review of the literature, it was anticipated that three compound traits - *sense of uniqueness*, *need to evaluate* and *need for cognition* – could be linked to situational and surface traits in the context of online apparel mass-customisation.

**Sense of uniqueness**

*Sense of uniqueness* is defined as *"(…) one-dimensional construct reflecting the perception of oneself as an individual with special personal characteristics different from others."* (Şimşek & Yalınçetin, 2010, p. 576)

Research on uniqueness has been around since the uniqueness theory development by Snyder and Fromkin (1980) with particular emphasis on public and socially displays of uniqueness, and in consumption as a mean to pursue the desire level for uniqueness (Lynn & Harris, 1997a; Tian & McKenzie, 2001). However, less is known about the individual level of *sense of uniqueness* (Şimşek & Yalınçetin, 2010). In an early development of the Desire for Consumer Unique Products scale (DCUP), Lynn and Harris (1997a) proposed the self-attributed need for uniqueness concept. This self-uniqueness was found to be related to several uniqueness behaviours, such as the desire for scarce products, consumer innovativeness, preference for

unique shopping venues, desire for customised products (Lynn & Harris, 1997a), and positive attitudes toward personalisation (Halepete et al., 2009). Thus, it is expected that consumers who believe they are unique and have distinctive characteristics, present a high *desire for unique products* since the acquisition of these goods allow them to express their *sense of uniqueness*.

H6: *Sense of uniqueness* has a positive effect in the *desire for unique products*

Consumers who express high *sense of uniqueness* are also expected to be more involved with apparel. The consumer is more involved with a product category if the product is more close to his/her needs and values. Consequently, involvement is created by the relevance that the product has to the individual, which stimulates the need to search for information, more knowledge and experience (Michaelidou & Dibb, 2008; Naderi, 2013). So, it is expected that *sense of uniqueness* will have an effect on involvement with apparel products.

H7: *Sense of uniqueness* has a positive effect in *apparel involvement*

**Need to evaluate**

*Need to evaluate* is defined as self-attributed trait which express an individual difference on the tendency to engage on evaluations (W. B. G. Jarvis & Petty, 1996).

Evaluation is stated as a dominant response for most people in most situations and can have several functions (W. B. G. Jarvis & Petty, 1996). People may be compelled to make evaluations by rewards concerning the control of one's environment, by positive social interaction, and by the opportunity to self-expression and enhanced self-image.

The tendency to engage in evaluative behaviours differs across individuals. While some find it easy to make evaluations about all sorts of objects or situations even if they do not possess extensive knowledge or are exposed to them frequently, others may have a non-evaluative tendency by the lack of knowledge or attention to the situation itself (W. B. G. Jarvis & Petty, 1996). Individuals high in need to evaluate are more likely to engage in spontaneous evaluations and develop attitudes toward a variety of social questions, than those low in *need to evaluate* (Tormala & Petty, 2001).

Vieira (2012) approached the relationship between *need to evaluate* and *need for touch* and found that *need to evaluate* was positively associated with the instrumental dimension of *need for touch*. This might suggest an association with the information acquisition to decision making. A similar relationship is predictable in the current research. Consumers exhibiting a

tendency to make evaluations are expected to show a high need for touch, since touch is extremely related to information acquisition and to the evaluation of products attributes.

H8: *Need to evaluate* has a positive effect in n*eed for touch*

Individuals with higher evaluation needs are frequently driven by the need to control outcomes and to structure and understand the environment (W. B. G. Jarvis & Petty, 1996), characteristics which are common among individuals with high *need for reality*. So it is also expected that *need to evaluate* to be related to *need for reality*.

H9: *Need to evaluate* has a positive effect in *need for reality*

**Need for cognition**

*Need for cognition* was first conceptualized by A. R. Cohen, Stotland and Wolfe (1955), which described it as "(…) *a need to structure relevant situations in meaningful, integrated ways.* (…) *It is a need to understand and make reasonable the experiential world.*" (A. R. Cohen et al., 1955, p. 291). Later, Cacioppo and Petty (1982) following the work by A.R. Cohen et al. (1955) and in the absence of a measure of *need for cognition*, explore it and define it as *"(…) an individual's tendency to engage in and enjoy effortful cognitive endeavours*" (Cacioppo, Petty, & Kao, 1984, p. 306).

*Need for cognition* is considered a stable intrinsic motivation that derived from past experiences, memories and past behaviours, influencing actual experiences and the way individuals process information differently (Cacioppo & Petty, 1982; Cacioppo, Petty, Feinstein, & Jarvis, 1996). This individual difference can be considered as one of the most important variables that influence the motivation to engage in mental processing (Haugtvedt, Petty, & Cacioppo, 1992; H. M. Kim & Kramer, 2006).

Individuals high in *need for cognition* have been reported has having a natural tendency to seek/search, have high levels of curiosity, think about, analyse and reflect more about stimulus and be more devoted to engage in cognitive effort (H. M. Kim & Kramer, 2006; Seggelen-Damen, 2013). These individuals perceive themselves as problem solvers and generate complex explanations, easily reconciling inconsistent information, and achieve higher levels of pleasure from more complex tasks (Haugtvedt et al., 1992; Neuberg & Newsom, 1993). Because they tend to have attitudes more thoughtfully based, more persistent over time and are less likely to be influenced by others, their attitudes are better predictors of intention and behaviour than those from less thoughtful individuals (Cacioppo et al., 1996). In contrast low need for cognition individuals tend to avoid demanding cognitive work and are more likely to process

information heuristically (Haugtvedt et al., 1992). When confronted with effortful think and complex tasks they usually experience stress and anxiety (Cacioppo et al., 1984).

Questions about cognition and complex tasks have been approach by Eisenman and Platt (1968) which proposed the complexity-simplicity preference, an indicator of the differences in cognitive behaviour. Also Bieri (1955) (as cited in Curşeu & Rus, 2005) ponder on complexity and introduced the concept of cognitive complexity. Later Tan and Dolich (1980, p.547) define cognitive complexity as "*the extent to which and individual uses a system of cognitive dimensions in a differentiated manner to construct cognitions of stimulus objects. A complex person should utilize a differentiated system of more numerous dimensions than does a less complex individual*."

These evidences seem to point toward the existence of a relationship between cognition and complexity, so it is expected that *need for cognition* present a negative direct effect on *need for simplicity*.

H10: *Need for cognition* has a negative effect on *need for simplicity*

Tuten and Bosnjak (2001b) found *need for cognition* to be positively correlated with using the Internet for activities, which entails a cognitive component like the search product for information. In terms of internet shopping, due to the amounts of information provided by online environments and the increase of interactivity levels, it is expected that individuals high in *need for cognition* would also be willing to use online shopping and be highly involved with the purchase. Thus, a positive effect of *need for cognition* on intention to purchase online mass-customised apparel products is hypothesised.

H11. *Need for cognition* has a positive effect on *intention to purchase online mass-customised apparel products*

### 3.2.4 Elemental traits

Elemental traits are defined as basic underlining predispositions as a result of genetics and early learning experiences, combining cultural processes and early learning. In the 3M model Mowen (2000) considers these traits as the most basic components of the personality-motivational structure of the individual and are fundamental, since they act as reference point to the behavioural system. These traits are at the highest level of abstraction and are cross-situational in nature.

Elemental traits are composed by eight traits, five derived from the Five-factor model of personality - commonly known as the Big Five (Openness, Conscientiousness, Extraversion, Agreeability and Neuroticism) - (Goldberg, 1992; Saucier, 1994), two come from the evolutionary psychology (Need for material resources and Physical Resources/body) (Buss, 1988) and one emerge from arousal theories (Need for arousal) (Zuckerman, 1979). The discriminant and predictive validity of these traits has been supported in several studies conducted by Mowen (2000) in the development of the 3M Model and confirmed by other authors (e.g. Licata, Mowen, Harris, & Brown, 2003; Mowen, Fang, & Scott, 2009; Mowen, Park, & Zablah, 2007).

From the eight elemental traits, only *openness to experience*, *extraversion*, *neuroticism*, *need for material resources* and *need for arousal*, were identified as possible predictors of compound, situational and surface in the context of this research. Accordingly, these are the only ones that will be further discussed.

**Openness to experience**

*Openness to experience* is a trait related to intellectual curiosity and creativity, and is defined as "*The need to find novel solutions, express original ideas, and use the imagination in performing tasks*." (Mowen, 2000, p. 29).

Individuals with high degree of openness are typically open-minded, open to different opinions and viewpoints (McCrae & Costa, 1985; Tsao & Chang, 2010), as well as more curious, more imaginative and with divergent thinking abilities (McCrae, 1987). Thus, they tend to have a higher disposition to try and experience new approaches, as for example online shopping (Bosnjak, Galesic, et al., 2007; Tsao & Chang, 2010).

Online shopping of mass-customised products, along with being a new approach to shopping, provides individuals the possibility to use imagination and express creativity in product development/customisation. Thus, the novelty and excitement provided by online mass-customisation is expected to be attractive to individuals high on openness.

H12. *Openness to experience* has a positive effect on *intention to purchase online mass-customised apparel products*

Openness individuals tend to prefer new experiences and enjoy intellectually stimulating environments, which lead to a higher tolerance for the unfamiliar and to process new information or environment's stimulus more easily (McCrae & John, 1992). On the cognitive aspects, several authors (e.g. Cacioppo et al., 1996; Chen, 2011; Dollinger, 2003; Mowen, 2000) found *openness to experience* to be related to the tendency for engaging and enjoy effortful cognitive activities (high on *need for cognition*). Tuten and Bosnjak (2001b) focusing on

individual differences on internet usage also found openness and *need for cognition* to be related, so, in this study, a similar relationship is expected.

H13. *Openness to experience* has a positive effect on *need for cognition*

**Extraversion**

*Extraversion* is the trait linked with socialization and expression and was defined by Mowen (2000, p.29) as: "*Operationalized as introversion; the tendency to reveal feelings of bashfulness and shyness*"

An extrovert person is more sociable, talkative, enthusiastic and tends to seek sensory excitements, which lead he to be more open to change and new ideas or things (Huang, 2009; McCrae & Costa, 1985). Extraverts stress the importance of social activities and tend to enjoy intense personal interactions, in contrast introverts are less sociable and more reserved.

Although *extraversion* is negatively correlated to the use of internet for social purposes because extraverts prefer face to face interaction, extraverts tend to use internet for online activities that are not associated to sociability features, as for example shopping (McElroy, Hendrickson, & Townsend, 2007), thus the following hypothesis is proposed:

H14. *Extraversion* has a positive effect on *intention to purchase online mass-customised apparel products*

Extrovert individuals are characterised by being social, talkative and expressive (McCrae & Costa, 1985), which may lead them to engage in evaluative behaviours to incite positive social interaction or by the opportunity to self-expression. This relationship has been indicated by Tuten and Bosnjak (2001a), who found that *extraversion* has a significant effect on *need to evaluate*.

H15. *Extraversion* has a positive effect on *Need to evaluate*

Following Şimşek and Yalınçetin (2010) findings, it is also hypothesised that *extraversion* is related to the personal *sense of uniqueness*. These authors found *extraversion* to be the Big Five personality trait with the highest correlation with *sense of uniqueness*. So, it is propose that more extraverted individuals, those who express openly a high willingness to be involved with social environment tend to feel that they are unique and have special characteristics.

H16. *Extraversion* has a positive effect on s*ense of uniqueness*

**Neuroticism/ emotional instability**

*Neuroticism* is conceptualised as an elemental trait and defined as: "*The tendency to emotionality as expressed by moodiness and by being temperamental*." (Mowen, 2000, p. 29).

Neurotic individuals have difficulty in controlling their emotions, tend to be fearful, embarrassed and distrustful. Since neurotics are more emotionally unstable and more sensitive to negative events, they are more likely to have difficulty to manage stress, and experience anxiety and depression more frequently (Huang, 2009; McCrae & Costa, 1985; McElroy et al., 2007). *Neuroticism* has been found as one of the factors that more negatively influences self-esteem. High neurotic individuals tend to have low self-esteem (Chamorro-Premuzic, Stumm, & Furnham, 2011), which, in turn, will generate a low *sense of uniqueness*, that is, they believe that no special and unique characteristics define them. So, based on these evidences a relationship between *neuroticism* and *sense of uniqueness* is hypothesised.

H17. *Neuroticism* has a negative effect on *sense of uniqueness*

Neurotic individuals are also characterised by being more sensitive to others judgments and may suffer from an inferiority complex. Because mass-customisation allows the expression of individuality by providing the opportunity to select and combine product attributes into unique apparel products, it is expected that mass-customisation will not be attractive to these individuals since they feel more insecure when having to make decisions (McElroy et al., 2007).

H18. *Neuroticism* has a negative effect on *intention to purchase online mass-customised apparel products*

**Need for material resources**

Need for material resources is defined as "*The need to collect and possess material goods*" (Mowen, 2000, p. 29). This elemental trait derives from evolutionary psychology, and it considers the desire to possess goods (as clothing, weapons or shelters) a basic requirement for human's survival and reproduction (Mowen, 2000). Nowadays this desire for material goods can be named materialism. Recent studies with 3M (e.g. Mowen et al. 2010; Kang & Johnson 2015; Mowen, Fang, et al. 2009) have applied the term materialism as a similar construct, when referring to material needs. Although being negatively interpreted, a regular and not extreme level of materialism is necessary to individuals' survival (Mowen, 2000).

The desire to possess and the importance given by individuals to different possessions, namely apparel, has been associated to different levels of attachment/involvement. The stronger the materialistic tendencies of individuals, the higher their involvement with the product (O'Cass, 2004). Browne & Kaldenberg (1997) reported materialistic individuals to be more interested in apparel, more likely to understand its symbolic value and to view apparel purchase as important. Correspondingly, in this study a relationship between the *need for material resources* and *apparel involvement* is proposed.

H19. *Need for material resources* has a positive effect on *apparel involvement*

Materialists have been found to rely heavily on external cues (Richins & Dawson, 1992), favouring possessions worn or used in public places and seeing them as the most appropriate symbols to use in the process of symbolic self-completion. The purchase of apparel is in an evidence of individual's effort to demonstrate that they possessed certain self-definitions (Dittmar, Beattie, & Friese, 1996). Since mass-customised products fits well desires of self-expression, it is expected that consumers with higher desire for material goods have higher intention to purchase online mass-customised apparel products.

H20. *Need for material resources* has a positive effect *intention to purchase online mass-customised apparel products*

**Need for arousal**

The *need for arousal* is defined as "*The desire for stimulation and excitement*." (Mowen, 2000, p. 29) and is related to individual differences in response to environmental stimulus that will result in feelings of calm or excitement (Mehrabian & Russel, 1974). Individuals with a high *need for arousal* tend to seek more stimulation activities (Guido, Capestro, & Peluso, 2007), are attracted to novel and unique situations, motivated by variety seeking, more curious and have a tendency to seek risk (Mehrabian & Russel, 1974; Steenkamp & Baumgartner, 1992).

The effects of this need can be explained by the optimum stimulation theory, which states that each organism has a preferred level of stimulation, and that individuals try to maintain an optimum level of stimulation, correcting it if it becomes too high or too low. Individuals who are under aroused will look for situations that increase their stimulation levels, and those over aroused the opposite (Zuckerman, 1990). Online mass-customisation can be regarded as an experience with a high level of stimulation, as a result of the process itself, the novelty, and the resulting risk associated with it. Therefore, it is not surprising that previous studies (e.g. Fiore et al., 2004, 2001) have demonstrated that individuals with high arousal needs perceive mass-customisation and co-design as an exciting experience to acquire unique products. So, it

is expected that the *Need for arousal* present a positive direct effect over the intention to purchase online customised apparel products.

H21. *Need for arousal* has a positive effect on *intention to purchase online mass-customised apparel products*

A summary of the hypotheses is presented in Table 4 and the conceptual model in Figure 4.

Table 4 Hypotheses summary

| ***Construct*** | ***Hypotheses*** |
|---|---|
| ***Situational traits: need for touch*** | H1: *Need for touch* has a negative effect on *intention to purchase online mass-customised apparel products* |
| ***Situational traits: desire for unique products*** | H2: *Desire for unique products* has a positive effect on *intention to purchase online mass-customised apparel products* |
| | H2a: *Desire for unique products* moderate the negative effect of n*eed for touch* on *intention to purchase online mass-customised apparel products* |
| ***Situational traits: need for simplicity*** | H3: *Need for simplicity* has a negative effect on *intention to purchase online mass-customised apparel products* |
| ***Situational traits: need for reality*** | H4: *Need for reality* has a negative effect on *intention to purchase online mass-customised apparel products* |
| ***Situational traits: apparel involvement*** | H5: *Apparel involvement* has a positive effect *intention to purchase online mass-customised apparel products* |
| | H5a: *Apparel involvement* moderate the negative effect of n*eed for simplicity* on *intention to purchase online mass-customised apparel products* |
| | H5b: *Apparel involvement* moderate the negative effect of *need for reality* on *intention to purchase online mass-customised apparel products* |
| ***Compound traits: sense of uniqueness*** | H6: *Sense of uniqueness* has a positive effect in the *desire for unique products* |
| | H7: *Sense of uniqueness* has a positive effect in *apparel involvement* |
| ***Compound traits: need to evaluate*** | H8: *Need to evaluate* has a positive effect in n*eed for touch* |
| | H9: *Need to evaluate* has a positive effect in *need for reality* |
| ***Compound traits: need for cognition*** | H10: *Need for cognition* has a negative effect on n*eed for simplicity* |
| | H11: *Need for cognition* has a positive effect on *intention to purchase online mass-customised apparel products* |
| ***Elemental traits: openness to experience*** | H12: *Openness to experience* has a positive effect on *intention to purchase online mass-customised apparel products* |
| | H13: *Openness to experience* has a positive effect on *need for cognition* |
| ***Elemental traits: Extraversion*** | H14: *Extraversion* has a positive effect on *intention to purchase online mass-customised apparel products* |
| | H15: *Extraversion* has a positive effect on *need to evaluate* |
| | H16: *Extraversion* has a positive effect on *sense of uniqueness* |
| ***Elemental traits: Neuroticism*** | H17: *Neuroticism* has a negative effect on *sense of uniqueness* |
| | H18: *Neuroticism* has a negative effect on *intention to purchase online mass-customised apparel products* |

| *Construct* | *Hypotheses* |
|---|---|
| ***Elemental traits:*** | H19: *Need for material resources* has a positive effect on a*pparel involvement* |
| ***Need for material resources*** | H20: *Need for material resources* has a positive effect *intention to purchase online mass-customised apparel products* |
| ***Elemental traits: need for arousal*** | H21: *Need for arousal* has a positive effect on *intention to purchase online mass-customised apparel products* |

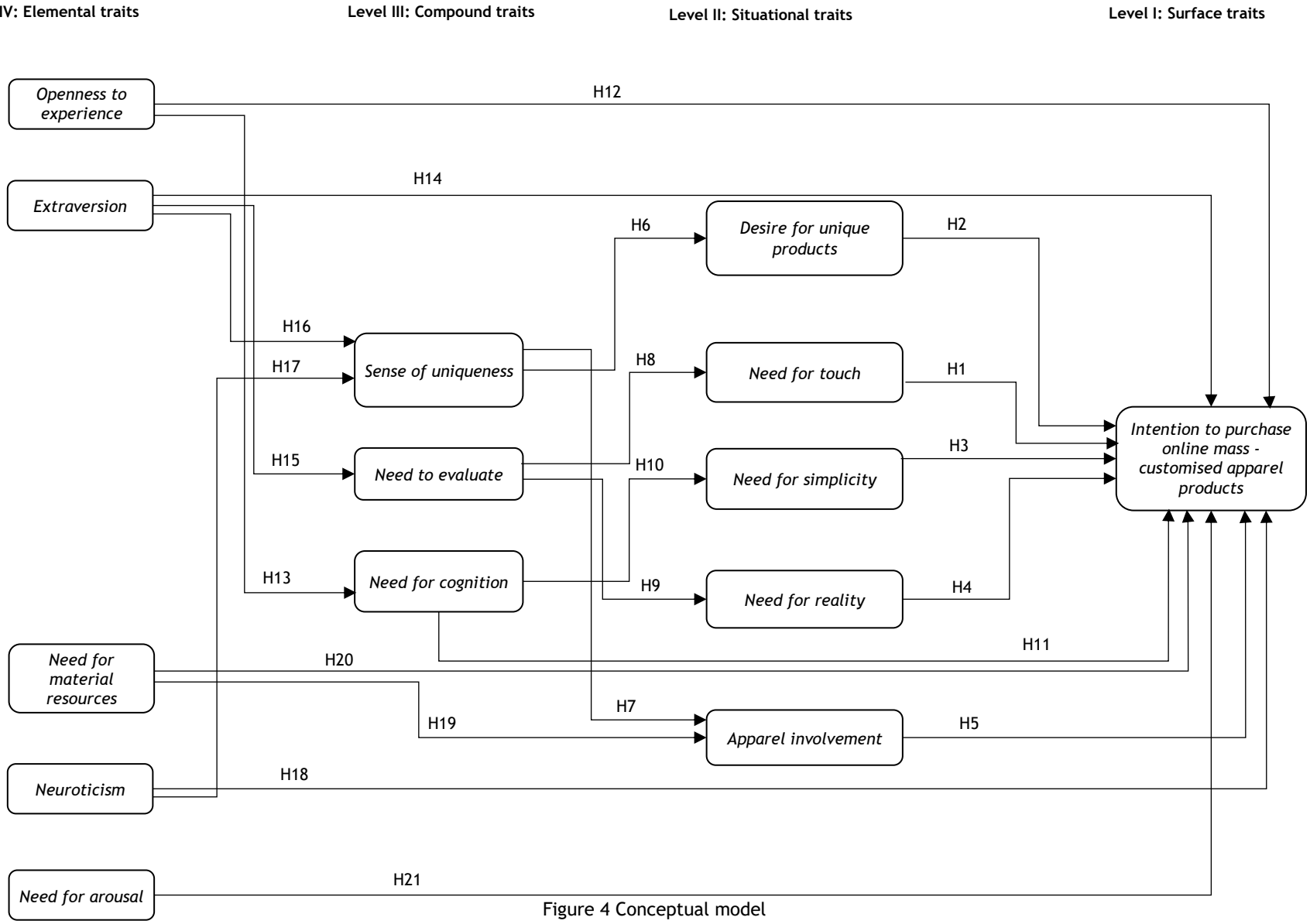


Figure 4 Conceptual model

# Chapter 4 Methodology

## 4.1 Introduction

The main purpose of this chapter is to describe the methodology of the current research. The overall research process will be described, along with the procedures used to design of the questionnaire and to collect the data. Finally, an explanation of the statistical procedures used to analyse data and test the hypotheses is provided.

## 4.2 Research Philosophy and Research Design

Collis and Hussey (2009, p.3) state that a lack of consensus exists in the definition of what a research is, although most authors agree that it is "*(…) a process of enquiry and investigation, systematic and methodical and increases knowledge*."

When conducting a research, it is essential to define the research problem, the approach and a plan with the methodological guidelines. For that the philosophical or epistemological positioning of the researcher and the research design should be defined.

At an epistemological level, the research can be viewed under the light of two major approaches: the positivist and the interpretivist, although others, as the post-positivist or constructivist, have also been referred and adopted by several authors (e.g. Creswell, 2014; Guba & Lincoln, 1994). The positivist is the one with more historical recognition due to its emphasis on the quantification of science by means of mathematics and physics (Guba & Lincoln, 1994), and was the first used for social sciences in the ninety century following Augusto Comte thoughts (Coutinho, 2011). For the positivist, the world remains unchangeable, and the reality is independent of us (Collis & Hussey, 2009), operated under laws of cause and effect, therefore it can be predicted and controlled. According to positivists, to be valid, knowledge must have the faculty to be measured (Krauss, 2005).

Under the positivist approach, the theory is the base, and after its discovery it should be tested and measured using quantitative research methods. Deduction is a characteristic of positivism, for this reason if the theory is not adequate to the facts and to the reality it must be revised and reconstructed (Collis & Hussey, 2009; Coutinho, 2011; Krauss, 2005). This continue to be the dominant perspective in social sciences and tend to be consider the most valid, mainly because information systems research had led to the development of important tools that can diminish human mistakes and by that assure a more accurate measurement of facts (Bharadwaj, 1996).

The other main approach is the interpretivist, and it is based in a notion that the world is subjective and relies on interpretations. Interpretivist portrays that the knowledge about the reality cannot be achieve independently of the social actors, and by that it depends on the observer view. Kuhn (1970, p.113) underlines it by saying that *"What a man sees depends upon both what he looks at (observations) and also upon what his previous visual-conceptual experience has taught him to see"*. This approach is based on induction and allows the understanding of the complexity of social phenomenon, not based on quantitative methods as the positivist, but on qualitative ones.

The present research follows broadly a positivist approach, using quantitative research methods, justified, by the nature of the research, the study objectives and the preference of the author.

In terms of research design it is assumed by several authors (e.g. Joseph F. Hair, Wolfinbarger, Ortinau, & Bush, 2010; Malhotra, 2010; Sue & Ritter, 2012) that three main types exist, exploratory, descriptive and explanatory/causal. Exploratory research is mainly used to clarify concepts and form hypotheses, not to test them. Descriptive research, as the name signals, is used to describe people, products or situations. It is usually guided by research questions but not by hypotheses. Further, explanatory or casual research is characterized by having research hypotheses that express conceivable relationships between variables.

In the present research, the research design is both causal and exploratory, since the literature review made it possible to identify causal relationships between variables, but new constructs and relationships are also being explored.

## 4.3 Operationalization of constructs: measurement scales

The operationalization of constructs is the process of deciding how they are going to be measured, that is, how abstract phenomena are turned into quantitative variables for further analysis. The use of measurement scales is the operationalization method used in this research, being the most common procedure in social sciences (Black, 1999).

Mowen (2000) proposed and developed several scales during the development of the Meta-Theoretic Model of Motivation and Personality. The scales are characterized as being short and allow a successful application of the model. Since more than ten traits will be studied, it is vital to the success of data collection that short scales are employed. Short scales require less time to complete and are less stressful, increasing the response rate and the reliability and validity of the responses (Mowen, 2000). In the development of this research the same procedure was used by selecting unidimensional multi-items short scales ranging from three to eight items (Mowen, 2000). Next, the scales used to measure traits of the four levels of the hierarchical structure are presented. Additionally, an illustrative schema of the scales and indicators is presented in Figure 5.

Level IV: Elemental

***Openness to experience***
1.Frequently feel highly creative
2.Find novel solutions
3.Imaginative

***Extraversion***
1. Bashful when with people
2. Shy
3. Quiet when with people

***Neuroticism***
1. Moody more than others
2. Temperamental
3. Testy more than others
4. Emotions go way up and down

***Need for material resources***
1. Enjoy buying expensive things
2. Enjoy owning luxurious things
3. Acquiring valuable things is important to me
4. Like to own nice things more than most people

***Need for arousal***
1.Drawn to experiences with an element of danger
2. Like the new and different more than the tried and true
3. Seek an adrenaline rush
4. Enjoy taking risks more than other

"How often do you feel/act this way?" 9 point scale anchored by 1 – Never 9- Always Mowen (2000)

Level III: Compound

***Sense of uniqueness***
1. As people get to know me more, they begin to recognize my special features
2. I feel unique
3. I cannot think of many special characteristics that distinguish me from others (R)
4. I think that the characteristics that make me up are different from others'
5. I feel that some of my characteristics are completely unique to me

"Indicate to what extent you agree or disagree with the statement" 5-point Likert scale 1 = strongly disagree
5 = strongly agree Şimşek & Yalınçetin (2010)

***Need to evaluate***
1. I form opinions about everything
2. It is very important to me to hold strong opinions
3. I like to have strong opinions even when I am not personally involved
4. I have many more opinions than the average person
5. I only form strong opinions when I have to (R)

"Indicate to what extent the statement is characteristic of you"
5-point Likert type scale 1 = extremely uncharacteristic
5 = extremely characteristic
Bosnjak et al. (2007)

***Need for cognition***
1. Learning new ways to think doesn't excite me very much
2. I only think as hard as I have to
3. I feel relief rather than satisfaction after completing a task that required a lot of mental effort
4. I don't like the responsibility of handling a situation that requires a lot of thinking
5. Thinking is not my idea of fun
6. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities

"Indicate to what extent the statement is characteristic of you"
5-point Likert type scale 1 = extremely uncharacteristic
5 = extremely characteristic Mowen (2000)

Level II: Situational

***Desire for unique products***
1. I am very attracted to rare apparel
2. I tend to be a fashion leader rather than a fashion follower
3. I am more likely to purchase apparel if it is scarce
4. I would prefer to have apparel custom-made rather than ready-made
5. I enjoy having apparel that others do not
6. I rarely pass up the opportunity to order custom features on the apparel I purchase
7. I like to try new apparel before others do
8. I enjoy shopping at stores that carry apparel that is different and unusual

"Indicate to what extent you agree or disagree with the statement" 5-point Likert scale 1 = strongly disagree 5 = strongly agree
Adapted from Lynn & Harris (1997a)

***Need for touch***
1. I place more trust in apparel that can be touched before purchase
2. I feel more comfortable purchasing apparel after physically examining it
3. If I can't touch an apparel product in the store, I am reluctant to purchase the product
4. I feel more confident making a purchase after touching an apparel product
5. The only way to make sure an apparel product t is worth purchasing is to actually touch it
6. There are many apparel products that I would only purchase if I could handle them before purchase

"Indicate to what extent you agree or disagree with the statement" 7-point Likert scale 1 = strongly disagree and 7 = strongly agree (Peck & Childers, 2003)

***Need for simplicity***
1. I would like to simplify my life as much as I can
2. I like to dress in a simple way
3. In apparel purchase, I prefer have a limit number of choices
4. I feel confused when presented with a large number of apparel products options
5. When choosing apparel, I generally prefer simple or regularly predictable combinations than complex, irregular and whimsical

"Indicate to what extent you agree or disagree with the statement" 7-point Likert scale 1 = strongly disagree and 7 = strongly agree
Adapted from Duff et al. (2014) and developed

***Need for reality***
1. I need to have a clear picture of what a virtual apparel product looks in reality
2. A clear vision of the final fit of an apparel product is important to me
3. Virtual apparel is not the sort of product easy to picture as real
4. Image interactivity technologies (e.g. 2D and 3D images, avatars, zoom) are important to me in order to better visualize the real product
5. I easily form a real representation of a virtual product even with few information (R)
6. I do not mind to make an extra effort to get a more real picture of the virtual product

"Indicate to what extent you agree or disagree with the statement" 7-point Likert scale 1 = strongly disagree and 7 = strongly agree
Adapted from Laroche et al. (2005)

***Apparel involvement***
1.I have strong interest in clothes
2.Clothes are very important to me
3.I am very much involved with apparel
4.I consider apparel to be a central part of my life
5.I am an experienced user of apparel

"Indicate to what extent you agree or disagree with the statement"
5-point Likert scale
1 = strongly disagree 5 = strongly agree

Adapted from Ronald E. Goldsmith (2002) and Jones & Kim (2010)

Level I: Surface

***Intention to purchase online mass-customised apparel***
1.I find interesting purchasing customised apparel products on-line
2.If I have the chance, I will purchase customised apparel products on-line
3.I will try to purchase customised apparel products on-line in the near future
4.I plan to purchase customised apparel products on-line in the near future
"Indicate to what extent you agree or disagree with the statement"
7-point Likert scale 1 = strongly disagree 7 = strongly agree
Adapted from Kang (2008); Kang & Kim (2012) and developed

Figure 5 Measurement Scales

## 4.3.1 Elemental traits measures

For measuring the elemental traits a total of eighteen items developed and proposed by Mowen (2000) were used. Table 5 summarizes the constructs and the number of items.

Table 5 Construct and number of items for Elemental traits

| *Construct* | *Number of items* |
|---|---|
| *Openness to experience* | 3 |
| *Extraversion* | 3 |
| *Neuroticism* | 4 |
| *Need for material resources* | 4 |
| *Need for arousal* | 4 |

The scales have strong psychometric properties, across five studies in the theory development. The means for the Cronbach's alpha coefficient of the constructs were: *extraversion* = 0.86; material needs = 0.86; *need for arousal* = 0.88; emotional instability = 0.91; and *openness to experience* = 0.85. Others studies (Licata et al., 2003; Mowen et al., 2007) have also reported alpha coefficients above 0.80.

Mowen 2000) recommended that elemental traits be measured in 9-point scales anchored by 1 = never and 9 =always. To assess the traits, respondents were presented with short phrases and asked, "*How often do you feel/act this way*?"

## 4.3.2 Compound traits measures

To measure compound traits a total of sixteen items were used. Table 6 summarizes the constructs and the number of items.

Table 6 Construct and number of items for Compound traits

| *Construct* | *Number of items* |
|---|---|
| *Sense of uniqueness* | 5 |
| *Need for cognition* | 6 |
| *Need to evaluate* | 5 |

**Sense of uniqueness**

To measure *Sense of uniqueness*, the Personal *Sense of uniqueness* Scale (PSU) by Şimşek and Yalınçetin (2010) was used. The scale was developed and validated through five studies. It was found to be unidimensional, presenting high validity and reliability with an average Cronbach's Alpha of 0.81. Other studies by Şimşek and Demir (2013) and Demir et al. (2013) corroborated previous findings showing Cronbach's Alpha coefficients of 0.83 and 0.75 /0.77 (two samples) respectively.

The scale is composed by five items measured on a five-point Likert scale anchored in 1 = strongly disagree and 5 = strongly agree.

To assess the trait, respondents were asked "*Indicate to what extent you agree or disagree with the statement*".

**Need for cognition**

*Need for cognition* was measured by a short version of the *Need for cognition* scale with six items, developed by Mowen (2000), from the original *Need for cognition* scale (18 items) of Cacioppo et al. (1984). The scale was found to be unidimensional and the reliability tests indicated a good Cronbach's Alpha coefficient of 0.81. The correlation between the reduced scale and the original scale was r = 0.92. Lately Chen (2011) reapplied it getting a Cronbach's Alpha coefficient of 0.79.

In the original scale the items are scored on a nine-point Likert type scale 1=very strong agreement 2=strong agreement 3=moderate agreement 4= slight agreement 5= neither agreement nor disagreement 6=slight disagreement 7=moderate disagreement 8= strong disagreement 9=very strong disagreement. Considering that the nine-point scale could be stressful for the respondent a five-points scale anchored in 1 = extremely uncharacteristic and 5 = extremely characteristic, was used following the operationalisation by Haugtvedt et al. (1992).

To assess the trait, respondents were asked "*Indicate to what extent the statement is characteristic of you"*

**Need to evaluate**

*Need to evaluate* was measured with the short version of five items from Bosnjak et al. (2007) selected from the original scale by W. B. G. Jarvis and Petty (1996). The scale presented a Cronbach's Alpha coefficient of 0.83. The measurement was made using a five-point scale anchored in 1 = extremely uncharacteristic and 5 = extremely characteristic, according to the original scale.

To assess the trait, respondents were asked "*Indicate to what extent the statement is characteristic of you*"

## 4.3.3 Situational traits measures

The majority of scales used to measure the situational traits were adapted to fit the situational context of apparel online shopping. Two scales: *Need for reality* and *Need for simplicity* were developed specifically to the purposed of this study. To measure situational traits a total of thirty items were used. Table 7 summarizes the constructs and the number of items.

Table 7 Construct and number of items for Situational traits

| *Construct* | *Number of items* |
|---|---|
| *Desire for unique products* | 8 |
| *Need for touch* | 6 |
| *Need for simplicity* | 5 |
| *Need for reality* | 6 |
| *Apparel involvement* | 5 |

**Desire for unique products**

To measure the *Desire for unique products* was used the Desire for Unique Consumer Products Scale (DUCP) from Lynn and Harris (1997b). On the scale development by the authors, two samples reported Cronbach's Alpha coefficients above 0.78.

Other studies in the apparel mass-customisation field have used this scale, for example Kang and Kim (2012) reported a Cronbach's Alpha coefficient of 0.86 and J. Park et al. (2013) the value of 0.81 .

The scale is constituted by eight items measured on a five-point Likert scale anchored in 1 = strongly disagree and 5 = strongly agree.

To assess the trait, respondents were asked "*Indicate to what extent you agree or disagree with the statement*"

**Need for touch**

To measure the *need for touch*, two scales similar scales were considered: the *Need for touch* scale (NFT) from Peck and Childers (2003a) and Need for tactile input (NTI) from Citrin, Stem, Spangenberg and Clark (2003). The two scales have proven to be useful to assess *need for*

*touch*, but show some differences. The NTI scale tries to establish a generic *need for touch* with only one dimension while the NFT was conceptualized has having two dimensions (Jansson-Boyd, 2011). Considering the requisite of unidimensionality of scales to apply the 3M model the NTI scale seemed more appropriate, however the NFT has been largely applied and validated. The NFT scale comprises two dimensions: the autotelic and an instrumental; which can be studied independently. The instrumental dimension is related to the use of touch to acquire information and make a purchase decision, whether the autotelic reflects the need to touch without the specific purpose of purchasing but for the fun that offers (Peck & Childers, 2003a; Peck & Wiggins, 2006).

Considering all the above mentioned it was decided to measure the *Need for touch* using the instrumental dimension of the NFT scale by Peck and Childers (2003a) mainly due to its relationship between haptic exploration with the purchase objective. Is also important to mention that several studies have applied only one of the dimensions successfully, for example the autotelic dimension was successfully used by Peck and Wiggins (2006) and Peck and Johnson (2011) and the instrumental dimension by Jin (2011).

The Need for touch scale was developed across seven studies through which its psychometric properties were assessed. The scale revealed high reliability with an average Cronbach's Alpha coefficient of 0.95. Since its development it has been applied in several studies, for example Workman and Caldwell (2007) with α= 0.92, Cho & Workman (2011) with α=0.96, and Keng et al. (2012) with α= 0.89.

The scale is composed by six items, measured on a seven-point scale anchored in 1 = strongly disagree and 7 = strongly agree.

To assess the trait, respondents were asked "*Indicate to what extent you agree or disagree with the statement*".

**Need for simplicity**

*Need for simplicity* was measured with a developed scale, incorporating two adapted items from a *need for simplicity* scale from Duff, Yoon, Wang, and Anghelcev (2014), and three developed.

The scale is constituted by five items, measured on a seven-point scale anchored in 1 = strongly disagree and 7 = strongly agree.

To assess the trait, respondents were asked "*Indicate to what extent you agree or disagree with the statement*".

**Need for reality**

*Need for reality* was measured by a developed scale, incorporating three items inspired by the concept of mental intangibility by Laroche et al. (2005), and other three developed.

The scale is constituted by six items measured on a seven-point scale anchored in 1 = strongly disagree and 7 = strongly agree.

To assess the trait, respondents were asked "*Indicate to what extent you agree or disagree with the statement*".

**Apparel involvement**

*Apparel involvement* was measured with a five item scale, build using two items from Goldsmith (2002) and three from Jones and Kim (2010). The scale from Jones & Kim (2010) presents a Cronbach's Alpha coefficient of 0.98.

The items are measured on a five-point scale anchored in 1 = strongly disagree and 5 = strongly agree.

To assess the trait, respondents were asked "*Indicate to what extent you agree or disagree with the statement*".

### 4.3.4 Surface traits measures

*Intention to purchase online mass-customised apparel products* was measured by two items adapted and applied by Kang (2008) and Kang and Kim (2012) based on Ajzen (1991) and by two others developed.

The scale is constituted by four items, measured on a seven-point scale anchored in 1 = strongly disagree and 7 = strongly agree.

To assess the trait, respondents were asked about their behavioural intention by "*Indicate to what extent you agree or disagree with the statement*".

## 4.4 Data collection

The success of a quantitative approach relies on the design and administration of the instruments tools selected for data gathering. In the present research data was acquired using an online survey.

In terms of administration, the survey method can be classified into three main categories, person-administered, telephone-administered and self-administered (Joseph F. Hair, Wolfinbarger, et al., 2010). Online Self-administered surveys are nowadays the most used type in marketing research (Joseph F. Hair, Wolfinbarger, et al., 2010), and was also the method selected for this study, since it presented several advantages (Joseph F. Hair, Wolfinbarger, et al., 2010; Sue & Ritter, 2012; Zhou et al., 2007), namely:

- Low cost
- Fast, greater turnaround time
- Ability to survey hard-reach-samples
- Wide geographic reach
- Respondent control
- No-interviewer response bias
- Anonymity in responses
- Possibility to randomize the order of questions
- Missing data can be eliminated (by not providing the possibility to skip questions and move forwards)

The option to develop an online self-administered questionnaire for data collection was considered by the advantages presented above, but also by its relevance to the research topic, online shopping, turning it the ideal medium to be used. By selecting this method, it was not necessary to address the concerns of individuals that do not have access to the Internet, that, supposedly, do not shop customised apparel products online.

Another aspect that affects the method selected for data collection is the population and sampling. Sampling involves the selection of a small number of elements from a larger defined group. Two types of sampling exist, probability and nonprobability. Probability sampling includes simple random, systematic random, stratified random and cluster sampling. The nonprobability sampling type includes convenience, judgement or purposive sampling, quota and snowball sampling (Joseph F. Hair, Wolfinbarger, et al., 2010).

The population for this study comprises Internet users that have already purchase apparel online and those that exhibit propensity to do so. Since, no list of Internet users with these characteristics is available, selecting a random sample directly from the population was impossible.

Considering the characteristics of our population and the research context, a non-probabilistic sampling procedure – convenience sampling was used to collect the data. In this procedure, the sample is selected based on convenience and on the ease with which the researcher can access the potential participants. Convenience sampling is one of the most used in the social sciences because it makes it is easy to obtain a large number of questionnaires quickly and economically, even though it encounter several disadvantages, namely the unlikelihood of obtaining a

representative and unbiased sample (Joseph F. Hair, Wolfinbarger, et al., 2010; Malhotra, 2010).

As pointed out by Amaro (2014), despite the disadvantages of convenience sampling, the majority of studies in online shopping uses convenience student samples (e.g. H. Cho & Wang, 2010, p.; Dellaert & Dabholkar, 2009; Fiore et al., 2001; H.-H. Lee & Chang, 2011), mainly because being an easy group to reach, have internet experience and use it frequently. In the present study, the sample will be extended to other society groups, to reach a large diversity of internet users.

## 4.5 Questionnaire Design

The questionnaire was originally written in English, and translated to Portuguese by a Portuguese native speaker, but proficient in the English language (see Appendix 2). The accuracy of the translation was done by the researcher, supervisors and two field experts. A special concern to scales translation was taken to assure content precision (assure the same meaning in the different languages) while guaranteeing questions clarity by suppressing technical or sophisticated language to avoid ambiguity (Iarossi, 2006). Additionally, the response choices were randomized to control order bias (Iarossi, 2006). A copy of the questionnaire can be found in Appendix 4.

The questionnaire started with an introductory section, devoted to the identification of the researcher and the organization doing the study. It was also provided an overview of the research scope and purpose, a request for participants to be honest and conscious in their answers, a warranty of confidentiality in data collection and finally the time estimate to questionnaire completion. An e-mail contact was also provided for clear eventual doubts.

It was decided that the minimization of cognitive effort was necessary to guarantee a successful data collection, because the majority of respondents are not willing to devote a lot of effort in questionnaire participation (Malhotra, 2010). Therefore, special concern was taken to divide the questionnaire in several sections, specifically five sections, to avoid crowded pages with lots of questions. This strategy assures a better flow in the fulfilling process, as too many questions on the same page can create a sensation of overwhelmed and complexity and consequently the respondent tends to dropped out (Malhotra, 2010).

The first section addressed demographic characteristics and online shopping behaviour. The following sections of the questionnaire focused on the data necessary to test the hypotheses. In these sections, the constructs to be measured were grouped according to the similarity of content due to the length of the questionnaire.

**First section**

The first section was divided into two subsections. The first subsection contained questions regarding respondent's demographic characteristics, gender, age, district of residence, education and employment and job status. These questions were mainly for descriptive purposes.

The second subsection contained questions to assess respondent's online shopping behaviours, namely the online purchase of apparel products and mass-customised apparel products.

In the introduction of this second subsection an explanation of the apparel customisation process was provided. Additionally, in the question regarding on-line shopping of mass-customised apparel products, a sentence with examples of customised apparel products was added for clarification of what should be considered within this category of products: "Example: t-shirt with personalized print; shirts or suits custom-made, with possible selection of fabric, design or measures"

**Second section**

The second section was devoted to gather data to measure the constructs specifically related to apparel and customisation (surface and compound traits) due to its importance and direct link to the topic under study, trying to captivate respondent' attention right from the beginning. According to Iarossi (2006), respondents may feel insecure in the beginning of the study, so the first questions must be pleasant, interesting and help to stimulate the interest.

**Third and fourth section**

The third and fourth sections contained questions indispensable for hypotheses testing. The constructs displayed in these sections measured traits of the second (situational traits) and third (compound traits) levels of the hierarchical model.

**Fifth section**

The final section of the questionnaire, contained questions regarding traits in the fourth level (elemental traits) of the hierarchical model. Personality directed questions were placed at the end, following Malhotra (2010) and Iarossi (2006) suggestions, that more personal or sensitive questions must be placed at the end of the questionnaire, when the respondents are already involved, confident and easily answer them without restrictions.

### 4.5.1 Data Collection Procedures

Before making the questionnaire available to respondents a pre-test was conducted with a convenience sample of individuals with differentiated ages and educational backgrounds from the general public. Malhotra (2010) suggests between 15 and 30 respondents, depending on the population and heterogeneity. For the present pre-test 16 individuals constitute the pre-test sample. The pre-test procedure was employed with the objective of assuring accuracy of the wording, understanding of questions format and content and also to control the time necessary to complete the questionnaire. Individuals were asked to comment on these topics.

Based on the comments from the pre-test, minimal changes were conducted (see Appendix 3).

A final version of the questionnaire was created using the Lime Survey platform at the University of Beira Interior and was available through the link: https://webx.ubi.pt/survey/index.php?sid=18361&lang=pt

The questionnaire was disseminated using several channels and mediums, with a brief presentation of the study and a dissemination request:

- E-mail invitation to personal contacts and colleagues;
- E-mails to Communication and Public Relations offices of several higher education Portuguese institutions;
- Links placed on social media: Facebook and LinkedIn.

The questionnaire was available online between January 7 and February 14 of 2016.

During this period a total of 1,139 complete responses was obtained of which 1,136 were considered valid. A summary of data collection details is presented in Table 8.

Table 8 Data collection summary

| **Population** | **Internet users >= 16 years** |
|---|---|
| Data collection method | Online Self-administered survey |
| Sampling method | Non-probabilistic – convenience |
| Data collection period | January, 7 2016 – February, 14 2016 |
| Number of valid responses | 1136 |

## 4.6 Data Analysis Procedures

Several statistical methods were used for data analyses. Firstly, descriptive statistics were used to analyse demographic variables and information related to online consumer behaviour.

Secondly, structural equation modelling (SEM) was conducted to validate the measures developed and to assess the hypotheses proposed. SEM is a popular statistical technique for multivariate data analysis in social sciences, and is considered a second generation technique, that is, an extension of factor analysis and regression (Iacobucci, 2009). SEM allow not only to examine the relationships between observable and latent variables, but also between latent variables, which is of great relevance for the study of perceptions, attitudes, and intentions (Leguina, 2015).

With a SEM approach is possible to answer research questions in a single and systematic analysis by modelling simultaneously the relationships between several independent and dependent variables (Joseph F. Hair, Black, Babin, & Anderson, 2010).

Researchers considering using SEM have to their disposal two possible approaches: the covariance-based SEM (CB-SEM) (Joreskog, 1978) and a variance-based or partial least-squares SEM (PLS-SEM) (Wold, 1985).

The CB-SEM method is the one with more tradition and still the most widely applied in all kinds of contexts. Basically it determines how a proposed theoretical model can estimate the covariance matrix for the sample data, employing a full information maximum likelihood estimation process (Chin, 2010).

However, PLS-SEM has gained popularity over the past decades (Joe F. Hair, Sarstedt, Ringle, & Mena, 2012). This method focus on explaining the variance in the dependent variables when examining the model, based on soft distributional assumptions. Thus, it avoids the assumptions of observations to follow specific distributional patterns (Chin, 2010). Consequently, PLS-SEM has been declared as being a "soft data analysis method", less rigorous in general. Nevertheless, it should not be seen as inferior when compared to CB-SEM. These methods should be considered complementary rather than competitive. The weakness of one are the strengths of the other (Gefen, Rigdon, & Straub, 2011; Joseph F. Hair, Hult, Ringle, & Sarstedt, 2014; SmartPLS, 2014). Chose CB-SEM or PLS-SEM mainly depends of the research goals. If the goal is theory testing, confirmation, or comparison of alternative theories, and explain covariance of a set of measured items based on underlying latent constructs, a CB-SEM method must be used. Contrary if the goal is to predict or identify the key driver constructs, if the research is mainly exploratory, and the objective is to study complex interrelationships among a set of factors, PLS-SEM method must be selected (Chin, 2010; Joseph F. Hair, Hult, et al., 2014).

To analyse the data obtained for the purpose of this study, the PLS approach was chosen for several reasons. First the PLS-SEM approach is considered more appropriate when the research

objective is to explore and predict theory, and the model proposed in the current study is grounded on an established theory (traits theory), but the theoretical support for the relationships proposed lacks strength (namely the ones concerning elemental and compound traits) and new measures (*need for reality* and *need for simplicity*) are proposed. Second, the PLS-SEM method is better suited for large and complex models[2] (Joe F. Hair et al., 2012; Joseph F. Hair, Hult, et al., 2014). The proposed model has 17 constructs, 82 indicators and 23 inner paths, which makes it a complex model.

Finally, the PLS-SEM method has less restrictive assumptions about the data, which is important when several constructs have few indicators. In our case the majority of elemental traits have only three indicators. Moreover, PLS does not impose any condition about the data distribution, and has been considered robust when applied to highly skewed data (Joe F. Hair et al., 2012; Joseph F. Hair, Hult, et al., 2014).

Structural equation models are composed by two components, the measurement model and the structural model. In the context of PLS the measurement model is referred to as outer model, which represent the relationships between constructs and their specific indicators. The second component is the structural model, named inner model in PLS, which specifies the relationships (paths) between the constructs (Joseph F. Hair, Hult, et al., 2014) (a graphic representation of the outer model and inner is presented in Appendix 6). The relationships between the constructs, as well as the indicators proposed in the current study, derived from previous literature review and measurement scales previously presented in subchapters 3.2 and 4.3.

A final consideration regards the sample size to apply SEM, since it can have repercussions in the achievement of statistical significance. When applying the PLS method large samples (as usually occur in CB-SEM), do not play a relevant role, since the PLS algorithm use OLS regression to estimate the model's partial regression relationships, that is why this method is considered useful to use with small samples. Barclay, Higgins, and Thompson (1995) suggested and it has been considered a popular rule of thumb for robust PLS-SEM estimations, that the sample size should be equal or larger of ten times the largest number of structural paths directed at a particular construct in the structural model.

Although, PLS is stated to achieve goods results with small samples, but like in other methods, smaller sizes usually imply higher sampling error. Moreover, PLS estimates improve and their average absolute error rates decrease as sample sizes increase (Marcoulides & Chin, 2013). In the present study, the sample size clearly met the recommendation made by Barclay et al. (1995).

[2] The mean of variables in CB-SEM studies is of 4.70 (Shah & Goldstein, 2006), compared with a mean of 7.94 in PLS-SEM studies 55 (Joe F. Hair et al., 2012) ; the mean of indicators in CB-SEM is reported by Baumgartner & Homburg (1996) of 12 indicators, while Shah & Goldstein (2006) referred 16.30; these values much lower than in PLS-SEM, 29.55 (Joe F. Hair et al., 2012)

# Chapter 5 Results

## 5.1 Introduction

This chapter presents the data collected results. A descriptive analysis of the respondents' demographic profile and their experience on online apparel shopping is firstly presented. For these steps, IBM SPSS Statistics 23 was used.

Next, the proposed model was estimated trough PLS-SEM with the evaluation of the outer and inner model, using SmartPLS 3.2.4 (Ringle, Wende, & Becker, 2015).

## 5.2 Descriptive Analysis of the data

The data obtained from the online questionnaire was exported from the survey software (Lime Survey) to IBM SPSS Statistics 23 to proceed with the descriptive analysis.

The questionnaire design did not allow the respondents to continue without answering the question, so there were no missing answers. However, from the 1139 completed questionnaires, three were eliminated due to unreliable entries in the "Age" field. Considering the purposes of the study, from the 1136 valid responses, only the respondents who have already bought apparel online and those who have not bought but consider the possibility of buying were considered, resulting in 852 responses to be analysed. Moreover, a detailed data cleaning process was conducted, and another twelve responses were deleted as they present incongruities in the apparel online shopping and customisation apparel online answers and display extreme low values of both *apparel involvement* and *desire for unique products*. Finally, 840 questionnaires were retained for further analyses.

### 5.2.1 Social-Demographic Characteristics

In this study the considered sample of 840 individuals, is composed by 658 females (78.3%) and 182 males (21.7%). The ages ranged from 16 to 70, with a mean age of 27 years (sd=9.524). The majority of the respondents live in the districts of Lisboa (16%), Castelo Branco, (15.5%), Leiria (14.2%), and Aveiro (11.7). Most of the respondents are from urban areas (70.1%). Concerning the education level, the majority has the 12th grade or less (35. 8%) and a college degree (32.4%). Finally, in terms of occupation, more than 50% are students (54. 2%) and the other

second larger category is composed by persons which work for others (33%). More detailed data is presented in Table 9.

Table 9 Descriptive Analysis of social-demographic characteristics

| *Variable* | *Description* | *Frequency* | *Percent %* |
|---|---|---|---|
| ***Gender*** | Female | 658 | 78.3 |
| | Male | 182 | 21.7 |
| | Total | 840 | 100 |
| ***Age*** | 16-21 | 272 | 32.4 |
| | 22-24 | 164 | 19.5 |
| | 25-32 | 204 | 24.3 |
| | 33-70 | 200 | 23.8 |
| ***District*** | Lisboa | 134 | 16 |
| | Castelo Branco | 130 | 15.5 |
| | Leiria | 119 | 14.2 |
| | Aveiro | 98 | 11.7 |
| | R. A. Madeira | 67 | 8 |
| | Coimbra | 48 | 5.7 |
| | Porto | 46 | 5.5 |
| | Santarém | 43 | 5.1 |
| | Viseu | 29 | 3.5 |
| | Braga | 26 | 3.1 |
| | Évora | 19 | 2.3 |
| | Guarda | 19 | 2.3 |
| | Setúbal | 19 | 2.3 |
| | Vila Real | 19 | 2.3 |
| | Bragança | 7 | 0.8 |
| | Portalegre | 6 | 0.7 |
| | Faro | 5 | 0.6 |
| | Viana do Castelo | 3 | 9.4 |
| | R. A. Açores | 2 | 0.2 |
| | Beja | 1 | 0.1 |
| | Total | 840 | 100 |
| ***Urban or Rural*** | Clearly Urban | 367 | 43.7 |
| | Mostly Urban | 222 | 26.4 |
| | Mostly Rural | 170 | 20.2 |
| | Clearly Rural | 74 | 8.8 |
| | I cannot say | 7 | 0.8 |
| | Total | 840 | 100 |
| ***Education level*** | 12th grade or less | 301 | 35.8 |
| | College degree | 271 | 32.4 |
| | Master degree | 165 | 19.6 |
| | Professional degree | 49 | 5.8 |
| | Doctoral degree | 29 | 3.5 |
| | Post-doc | 12 | 1.4 |
| | Other | 12 | 1.4 |
| | Total | 840 | 100 |
| ***Profession*** | Student | 439 | 54.2 |
| | Working for others | 277 | 33.0 |
| | Working for myself | 51 | 6.1 |
| | Unemployed | 38 | 4.5 |
| | Other | 30 | 3.6 |
| | Retired | 5 | 0.6 |
| | Total | 840 | 100 |

## 5.2.2 Online Shopping behaviour

Concerning online behaviour associated to apparel shopping, from the 840 respondents, 632 (75.2%) have already bought apparel products online, and do it mainly once a year (32.6%) or two (27.1%). From these, only 136 (21.5%) have already bought customised apparel, and reported a satisfaction of approximately 95% with the product outcome and the overall experience (see Table 10).

Table 10 Descriptive Analysis Online shopping Behaviour

| *Variable* | *Description* | *Frequency* | *Percentage %* |
|---|---|---|---|
| ***Apparel on-line shopping*** | Yes | 632 | 75.2 |
| | No, but I consider purchasing in the future | 208 | 24.8 |
| | **Total** | **840** | **100** |
| ***Frequency*** **only those who have already bought apparel on-line* | Once a year | 206 | **32.6** |
| | Every Semester | 171 | **27.1** |
| | Every Three months | 126 | **19.9** |
| | Monthly | 46 | **7.3** |
| | More than 1 time a month | 7 | **1.1** |
| | Other | 76 | **12** |
| | **Total** | **632** | **100** |
| ***Customised apparel shopping*** **only those who have already bought apparel on-line* | Yes | 136 | 21.5 |
| | No | 342 | 54.1 |
| | No, but I consider purchasing in the future | 154 | 24.4 |
| | **Total** | **632** | **100** |
| ***Satisfaction with mass-customised product*** **only those who have already bought customised apparel on-line* | Yes | 127 | 93.4 |
| | No | 9 | 6.6 |
| | **Total** | **136** | **100** |
| ***Satisfaction with mass-customised experience*** **only those who have already bought customised apparel on-line* | Yes | 129 | 94.9 |
| | No | 7 | 5.15 |
| | **Total** | **136** | **100** |

## 5.2.3 Measurement Scales

The means and standard deviation of the elemental, compound, situational and surface traits are presented in Table 11, Table 12, Table 13, and Table 14. For the overall descriptive statistics for items making up each of the traits, see Appendix 5.

Except for n*eed for material resources* (m=3.678, sd=1.948), all other elemental traits present mean scores above 4, being the ones with the highest mean scores *openness to experience* (m=6.525, sd=1.402) and *extraversion* (m=5.080, sd=2.011) (see Table 11).

Table 11 Descriptive Analysis of Elemental traits

| *Construct* | *Mean (m)* | *Standard Deviation(sd)* | *N* |
|---|---|---|---|
| ***Openness to experience*** [1] | 6.525 | 1.402 | 840 |
| ***Extraversion***[1] | 5.080 | 2.011 | 840 |
| ***Neuroticism***[1] | 4.107 | 1.812 | 840 |
| ***Need for material resources***[1] | 3.678 | 1.948 | 840 |
| ***Need for arousal***[1] | 4.564 | 1.929 | 840 |

[1] Based on a nine-point scale where respondents indicated how often they feel or act this way, 1 = never and 9 = always

The compound traits, *need for cognition* (m=3.906, sd=0.722) has the highest mean score, meaning that the majority of respondents enjoy activities characterized by effortful cognitive work. S*ense of uniqueness* (m=3.578, sd=0.651) and n*eed to evaluate* (m=3.461, sd=0.649) also present high mean scores, meaning that overall, respondents have a tendency to engage in evaluative behaviours and perceived themselves has having unique characteristics (Table 12).

Table 12 Descriptive Analysis of Compound traits

| *Construct* | *Mean (m)* | *Standard Deviation (sd)* | *N* |
|---|---|---|---|
| ***Need to evaluate*** [1] | 3.461 | 0.649 | 840 |
| ***Sense of uniqueness*** [2] | 3.578 | 0.651 | 840 |
| ***Need for cognition*** [1] | 3.906 | 0.722 | 840 |

[1] Based on a five-point scale, 1 = extremely uncharacteristic 5 = extremely characteristic
[2] Based on a five-point scale, 1 = strongly disagree 5 = strongly agree

The situational traits presenting the highest mean scores are *Need for touch* (m=5.231, sd=1.195) and *need for reality* (m=5.030, sd=0.767), meaning that respondents present a high need to touch apparel products and have difficulties in forming real images of virtual apparel products presented online. Respondents also presented moderated levels of *apparel involvement* (m=3.520, sd=0.821), desire for unique apparel products (m=2.99, sd=0.742) and *need for simplicity* when confronted with the possible variety and choices a mass-customisation platform offer (m=4.520, sd=1.171) (Table 13).

Regarding the surface trait explored, respondents present a moderate level of intentions to buy apparel mass-customised products (m=4.416, sd=1.251) (Table 14)

Table 13 Descriptive Analysis of Situational traits

| *Construct* | *Mean (m)* | *Standard Deviation(sd)* | *N* |
|---|---|---|---|
| ***Apparel involvement*** [1] | 3.520 | 0.821 | 840 |
| ***Desire for unique products*** [1] | 2.985 | 0.742 | 840 |
| ***Need for simplicity*** [2] | 4.520 | 1.171 | 840 |
| ***Need for touch*** [2] | 5.231 | 1.195 | 840 |
| ***Need for reality*** [2] | 5.030 | 0.767 | 840 |

[1] Based on a five-point scale, 1 = strongly disagree 5 = strongly agree
[2] Based on a seven-point scale, 1 = strongly disagree 7 = strongly agree

Table 14 Descriptive Analysis of Surface traits

| *Construct* | *Mean (m)* | *Standard Deviation(sd)* | *N* |
|---|---|---|---|
| ***Intention to purchase online apparel mass-customised products*** [1] | 4.416 | 1.251 | 840 |

[1]Based on a seven-point scale, 1 = strongly disagree 7 = strongly agree

## 5.3 Model assessment

The assessment of the conceptual model proposed in this study was done with SmartPLS3 (Ringle et al., 2015) and the path weighting scheme was selected to estimate the parameters of the outer and inner model. Three structural model weighting schemes (centroid, factor or path) can be selected, but according to Ringle et al. (2015) the results for the alternative weighting schemes have little difference, and the path weighting is the recommended, since it provides the highest R square value for endogenous latent variables and is generally applicable for all kinds of PLS path model specifications and estimations.

The assessment of the quality of models in PLS-SEM is built on nonparametric evaluation criteria based on bootstrapping and blindfolding. PLS is a distribution free multivariate data analysis technique, and so does not rely on distribution assumptions, which means that it does not initially provide t values to evaluate the estimate's significance. With the use of Bootstrapping procedure, a resampling approach that draws random samples, with replacement from the original data and uses these samples to estimate the path model multiple times under slightly changed data constellations (Davison & Hinkley, 1997), is possible to assess bootstrap standard errors, which can be used to approximate *t* values.

Running Bootstrap requires the selection of algorithm options (sign changes) and parameter settings (number of samples). In terms of sign options, which is how the procedure deals with sign changes during the bootstrap iterations, is possible to select between "no sign changes", "construct level changes" and "individual changes". The options "no sign changes" is the most recommended and was selected in the present study, since it results in the most conservative outcome, if the coefficients are significant under the "no sign change" condition, it will also be significant with the other two options (Joseph F. Hair, Ringle, & Sarstedt, 2012).

In terms of the number of subsamples to assure the stability of the results, it is recommended that the number of subsamples should be large, so a total of 5000 bootstrap subsamples were selected (Joe F. Hair et al., 2012; Joseph F. Hair, Hult, et al., 2014; Ringle et al., 2015).

Other configuration parameters can be defined, as the confidence interval method, test type and significance level. The Bias-Corrected and Accelerated (BCa) Bootstrap method was selected since it is considered the most stable method that does not need excessive computing time (Ringle et al., 2015). The creation of bootstrap confidence intervals follows a two-sided significance test of 0.05. A summary of the parameter settings is presented in Table 15.

Table 15 Parameter settings for the bootstrapping procedure

| *Parameter* | *Setting* |
|---|---|
| ***Weighting Scheme*** | Path |
| ***Maximum Iterations*** | 300 |
| ***Stop criterion (10^-X)*** | 7 |
| ***Subsamples*** | 5000 |
| ***Sign Changes*** | No Sign Changes |
| ***Confidence Interval Method*** | Bias-Corrected and Accelerated (BCa) Bootstrap |
| ***Test type*** | Two tailed |
| ***Significance Level*** | 0,05 |

### 5.3.1 Measurement model (Outer model)

The evaluation of the outer model consists in assessing the relationships between each construct and its indicators, the contribution of each indicator in representing its associated construct and how well the combined set of indicators represent the construct.

Before evaluating the outer model, researchers must distinguish between reflective and formative constructs measurement perspectives, since the procedures to evaluate reflective construct are not appropriated for formative (Joe F. Hair et al., 2012; Joseph F. Hair, Hult, et al., 2014).

In reflective constructs, indicators are considered to be functions of the latent construct, and changes in the underlining construct cause changes in the indicators, while in formative constructs, the indicators are assumed to cause the latent construct, and consequently changes in the indicators cause changes in the underlining constructs (C. B. Jarvis, MacKenzie, & Podsakoff, 2003). Based on the guidelines provided by C. B. Jarvis et al. (2003) the constructs in the present study are all considered reflective, and consequently the model to be assessed is a reflective model. Therefore the observed indicators are assumed to be a reflex of the latent variables and graphically the arrow is directed from its latent variable to the observed indicator (Joe F. Hair et al., 2012; Joseph F. Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014).

To evaluate reflective outer models several measures must be determined: indicator reliability (squared standardized outer loadings), internal consistency or reliability (Cronbach's alpha, composite reliability), convergent validity (indicator reliability and average variance extracted, AVE), and discriminant validity (Fornell-Larcker criterion, cross-loadings, Heterotrait-monotrait ratio of correlations (HTMT) )( (Joseph F. Hair, Hult, et al., 2014) (see Table 16).

Table 16 Criteria to assess reliability and validity in reflective models

| | |
|---|---|
| | ***Internal Consistency Reliability*** |
| *Cronbach's alpha* | "(…) estimate of the reliability based on the inter-correlations of the observed indicator variables." (Joseph F. Hair, Hult, et al., 2014). Should be higher than 0.7, although in exploratory studies 0.6 is acceptable |
| *Composite Reliability* | "(…) takes into account the different outer loadings of the indicator variables." (Joseph F. Hair, Hult, et al., 2014) Should preferably be between 0.7 and 0.9, but in exploratory research values between 0.60 to 0.70 are acceptable. |

| | |
|---|---|
| | ***Indicator Reliability*** |
| *Indicator loadings* | The indicator reliability specifies which part of an indicator's variance can be explained by the underlying latent variable (Gotz, Gobbers, & Krafft, 2010). Indicator loadings should be equal or higher than 0.708 (Joseph F. Hair, Hult, et al., 2014) |
| | ***Convergent validity*** |
| *Average Variance extracted* | "(…) the grand mean value of the squared loadings of the indicators associated with the construct." It should be above 0.5, meaning that the construct explains more than half of the variance of its indicators (Joseph F. Hair, Hult, et al., 2014) |
| | ***Discriminant validity*** |
| *Fornell-Larcker* | "It compares the square root of the AVE values with the latent variable correlations." (Joseph F. Hair, Hult, et al., 2014). The AVE of each construct should be higher than the squared correlations with all other constructs (Fornell & Larcker, 1981) |
| *Cross-loadings* | The loading of each indicator is expected to be greater than all of its cross loadings (Joseph F. Hair, Hult, et al., 2014) |
| *Heterotrait-monotrait ratio of correlations (HTMT)* | "The average of the heterotrait-heteromethod correlations (i.e., the correlations of indicators across constructs measuring different phenomena), relative to the average of the monotrait-heteromethod correlations (i.e., the correlations of indicators within the same construct) (Henseler, Ringle, & Sarstedt, 2015). If the HTMT value is below 0.90, discriminant validity has been established between two reflective constructs. |

Reliability measures, Cronbach's alpha, composite reliability and indicator loadings were calculated and are presented in Table 17 which also reports the results of the internal consistency reliability analysis and the convergent validity of the measurement scales.

The results indicate that in general the measures are robust in terms of their reliability. All Cronbach's alphas are higher than 0.7, except for *Need for reality* (0.631), but still above the acceptable threshold of 0.6, indicating that each constructs' indicators have the same meaning. The composite reliabilities, that many researchers consider more suitable for PLS-SEM than Cronbach's alpha (e.g. Joe F. Hair, Ringle, & Sarstedt, 2011; Joseph F. Hair, Hult, et al., 2014; Henseler, Ringle, & Sinkovics, 2009), range from 0.819 to 0.950, with exception of *Need for reality* that present an extreme low value of 0.060.

The indicator loadings from the majority of constructs are higher than 0.7, indicating that each measure is accounting for 50% or more of the variance of the underlying construct. The exceptions are in items DFUP2 (0.663), DFUP4 (0.520) and DFUP7 (0.689) from *desire for unique products*, items N4C1 (0.684) and N4C3 (0.647) from *need for cognition*, items N4S1 (0.594) and N4S2 (0.689) from *need for simplicity*, items N2E3 (0.657) and N2E5 (0.497) from *need to*

*evaluate*, items SOU1 (0.672) and SOU3 (0.532) from *sense of uniqueness*, and items N4R4 (-0.595) and N4R5 (0.677) from *need for reality* with values bellow 0.7, but still above 0.5. Joseph F. Hair, Hult, et al. (2014) suggest items with values between 0.4 and 0.7 should be considered and only be removed if the deletion improve an increase of composite reliability and AVE. Also indicators bellow 0.40 should not in any case be considered, that is the case of three items from *need for reality*, N4R1, N4R3 and N4R6 which present values of -0.004, 0,119 and -0.364.

Additionally, all indicator loadings with exception of those from the construct *need for reality*, are significant at the 0.05 level, as shown by the t-values obtained through bootstrapping.

Along with assessing the constructs reliability, it is necessary to check for construct validity. Construct validity is usually assessed by both convergent validity, and discriminant validity.

Convergent validity is assessed through the Average Variance Extracted (AVE) suggested by Fornell and Larcker (1981), which detects if the indicators for a construct are more correlated with one another than with indicators of another construct.

In the present study, the majority of the constructs present AVE values above 0.50, ranging from 0.510 to 0.864, with exception of *need for reality* and *need to evaluate*, with values of 0.243 and 0.481 respectively (Table 17).

Table 17 Measures of reliability and Validity

| *Construct* | *Indicators* | *Indicator loading* | *t-Statistic* | *P value* | *Cronbach's alfa* | *Composite reliability* | *Average Variance extracted* |
|---|---|---|---|---|---|---|---|
| ***Extraversion*** | EXTR1 | 0.925 | 89.609 | 0.000 | 0.922 | 0.950 | 0.864 |
| | EXTR2 | 0.940 | 120.613 | 0.000 | | | |
| | EXTR3 | 0.923 | 79.903 | 0.000 | | | |
| ***Openness*** | OPEN1 | 0.910 | 104,829 | 0.000 | 0.867 | 0.918 | 0.789 |
| | OPEN2 | 0.882 | 68,080 | 0.000 | | | |
| | OPEN3 | 0.873 | 48,066 | 0.000 | | | |
| ***Apparel involvement*** | INVO1 | 0.847 | 76,340 | 0.000 | 0.895 | 0.922 | 0.704 |
| | INVO2 | 0.858 | 83,223 | 0.000 | | | |
| | INVO3 | 0.875 | 90,964 | 0.000 | | | |
| | INVO4 | 0.812 | 52,875 | 0.000 | | | |
| | INVO5 | 0.802 | 52,731 | 0.000 | | | |
| ***Desire for unique products*** | DFUP1 | 0.777 | 46,580 | 0.000 | 0.860 | 0.891 | 0.510 |
| | DFUP2 | 0.663 | 27,685 | 0.000 | | | |
| | DFUP3 | 0.748 | 44,155 | 0.000 | | | |
| | DFUP4 | 0.520 | 14,830 | 0.000 | | | |
| | DFUP5 | 0.767 | 44,162 | 0.000 | | | |
| | DFUP6 | 0.737 | 37,964 | 0.000 | | | |
| | DFUP7 | 0.689 | 28,610 | 0.000 | | | |
| | DFUP8 | 0.775 | 44,720 | 0.000 | | | |
| ***Intention to purchase*** | IPCA1 | 0.798 | 44,595 | 0.000 | 0.914 | 0.940 | 0.798 |
| | IPCA2 | 0.925 | 125,838 | 0.000 | | | |
| | IPCA3 | 0.924 | 110,874 | 0.000 | | | |
| | IPCA4 | 0.921 | 129,806 | 0.000 | | | |

| *Construct* | *Indicators* | *Indicator loading* | *t-Statistic* | *P value* | *Cronbach's alfa* | *Composite reliability* | *Average Variance extracted* |
|---|---|---|---|---|---|---|---|
| ***Need for arousal*** | N4A1 | 0.887 | 59,080 | 0.000 | 0.899 | 0.929 | 0.766 |
| | N4A2 | 0.827 | 37,275 | 0.000 | | | |
| | N4A3 | 0.891 | 61,411 | 0.000 | | | |
| | N4A4 | 0.893 | 72,665 | 0.000 | | | |
| ***Need for cognition*** | N4C1 | 0.684 | 23,390 | 0.000 | 0.822 | 0.871 | 0.531 |
| | N4C2 | 0.740 | 30.211 | 0.000 | | | |
| | N4C3 | 0.647 | 22,867 | 0.000 | | | |
| | N4C4 | 0.779 | 41.076 | 0.000 | | | |
| | N4C5 | 0.740 | 31,544 | 0.000 | | | |
| | N4C6 | 0.773 | 37,977 | 0.000 | | | |
| ***Need for material resources*** | N4MR1 | 0.908 | 106,080 | 0.000 | 0.907 | 0.934 | 0.781 |
| | N4MR2 | 0.896 | 87,475 | 0.000 | | | |
| | N4MR3 | 0.881 | 70,646 | 0.000 | | | |
| | N4MR4 | 0.849 | 54,352 | 0.000 | | | |
| ***Need for reality*** | N4R1 | -0.004 | 0,026 | 0.979 | 0.631 | 0.060 | 0.243 |
| | N4R2 | 0.705 | 1,333 | 0.183 | | | |
| | N4R3 | 0.119 | 0,931 | 0.352 | | | |
| | N4R4 | -0.595 | 1,194 | 0.233 | | | |
| | N4R5 | 0.677 | 1,333 | 0.183 | | | |
| | N4R6 | -0.364 | 1,052 | 0.293 | | | |
| ***Need for simplicity*** | N4S1 | 0.594 | 11,657 | 0.000 | 0.768 | 0.837 | 0.508 |
| | N4S2 | 0.689 | 14,043 | 0.000 | | | |
| | N4S3 | 0.729 | 20,255 | 0.000 | | | |
| | N4S4 | 0.760 | 21,739 | 0.000 | | | |
| | N4S5 | 0.711 | 21,629 | 0.000 | | | |
| ***Need for touch*** | N4T1 | 0.876 | 9,127 | 0.000 | 0.900 | 0.922 | 0.667 |
| | N4T2 | 0.839 | 8,953 | 0.000 | | | |
| | N4T3 | 0.741 | 7,119 | 0.000 | | | |
| | N4T4 | 0.868 | 9,031 | 0.000 | | | |
| | N4T5 | 0.769 | 7,349 | 0.000 | | | |
| | N4T6 | 0.788 | 7,751 | 0.000 | | | |
| ***Need to evaluate*** | N2E1 | 0.762 | 8.199 | 0.000 | 0.727 | 0.819 | 0.481 |
| | N2E2 | 0.767 | 8.531 | 0.000 | | | |
| | N2E3 | 0.657 | 5.451 | 0.000 | | | |
| | N2E4 | 0.747 | 7.970 | 0.000 | | | |
| | N2E5 | 0.497 | 3.314 | 0.001 | | | |
| ***Neuroticism*** | NEUR1 | 0.824 | 8.728 | 0.000 | 0.879 | 0.914 | 0.727 |
| | NEUR2 | 0.880 | 8.561 | 0.000 | | | |
| | NEUR3 | 0.844 | 8.161 | 0.000 | | | |
| | NEUR4 | 0.861 | 9.498 | 0.000 | | | |
| ***Sense of uniqueness*** | SOU1 | 0.672 | 20.020 | 0.000 | 0.761 | 0.838 | 0.513 |
| | SOU2 | 0.792 | 40.558 | 0.000 | | | |
| | SOU3 | 0.532 | 10.123 | 0.000 | | | |
| | SOU4 | 0.773 | 35.049 | 0.000 | | | |
| | SOU5 | 0.779 | 30.084 | 0.000 | | | |

To measure discriminant validity two methods are usually used, the Fornell-Larcker criterion and the cross loadings (Henseler et al., 2009). Recently Henseler, Ringle, & Sarstedt (2015) propose an alternative approach, based on the multitrait-multimethod matrix, the Heterotrait-monotrait ratio of correlations (HTMT), to assess discriminant validity.

Discriminant validity determines if a construct is truly distinct from other constructs both in terms of how much it correlates with other constructs and how distinctly indicators represent only this single construct (Joseph F. Hair, Wolfinbarger, et al., 2010).Following the Fornell-Larcker criterion the correlations between constructs were examined using a matrix where the diagonal elements are the square roots of the AVEs. In Table 18 is possible to see the square root of each construct's AVE was found to be larger than its correlations with any other construct. Therefore, discriminant validity of the scales is supported.

Analysing Table 19, is possible to conclude that all HTMT values are below 0.90, which indicate discriminant validity has been firmly established between constructs.

Cross-loadings were also analysed and the results are presented in Table 20. The results also show that all indicators loaded on their respective construct more highly than on any other, confirming that the constructs are distinct.

Table 18 Discriminant validity

| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***1-Extraversion*** | **0,929** | | | | | | | | | | | | | |
| ***2-Openness*** | 0,166 | **0,888** | | | | | | | | | | | | |
| ***3-Apparel involvement*** | 0,056 | 0,200 | **0,839** | | | | | | | | | | | |
| ***4-Desire for unique products*** | 0,114 | 0,319 | 0,386 | **0,714** | | | | | | | | | | |
| ***5-Intention to purchase*** | 0,053 | 0,152 | 0,238 | 0,404 | **0,893** | | | | | | | | | |
| ***6-Need for arousal*** | 0,179 | 0,307 | 0,086 | 0,305 | 0,209 | **0,875** | | | | | | | | |
| ***7-Need for cognition*** | 0,163 | 0,293 | -0,053 | 0,000 | -0,026 | -0,004 | **0,729** | | | | | | | |
| ***8-Need for material resources*** | 0,028 | 0,137 | 0,331 | 0,350 | 0,087 | 0,248 | -0,069 | **0,884** | | | | | | |
| ***9-Need for reality*** | 0,036 | 0,213 | 0,212 | 0,252 | 0,332 | 0,191 | -0,084 | 0,059 | **0,493** | | | | | |
| ***10-Need for simplicity*** | -0,156 | -0,231 | -0,290 | -0,266 | -0,075 | -0,046 | -0,252 | -0,154 | -0,091 | **0,713** | | | | |
| ***11-Need for touch*** | -0,083 | 0,053 | 0,091 | 0,046 | -0,101 | -0,018 | -0,072 | 0,107 | -0,089 | 0,115 | **0,815** | | | |
| ***12-Need to evaluate*** | 0,204 | 0,239 | 0,160 | 0,250 | 0,113 | 0,178 | 0,189 | 0,125 | 0,095 | -0,150 | -0,005 | **0,694** | | |
| ***13-Neuroticism*** | -0,186 | -0,049 | 0,098 | 0,131 | 0,066 | 0,106 | -0,152 | 0,167 | -0,048 | 0,000 | 0,119 | 0,140 | **0,852** | |
| ***14-Sense of uniqueness*** | 0,089 | 0,266 | 0,198 | 0,348 | 0,155 | 0,218 | 0,019 | 0,147 | 0,159 | -0,132 | 0,024 | 0,261 | 0,068 | **0,716** |

Table 19 Heterotrait-monotrait ratio of correlations (HTMT)

| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***1-Extraversion*** | | | | | | | | | | | | | | |
| ***2-Openness*** | 0.183 | | | | | | | | | | | | | |
| ***3-Apparel involvement*** | 0.065 | 0,226 | | | | | | | | | | | | |
| ***4-Desire for unique products*** | 0.126 | 0,373 | 0,432 | | | | | | | | | | | |
| ***5-Intention to purchase*** | 0,058 | 0,175 | 0,261 | 0,455 | | | | | | | | | | |
| ***6-Need for arousal*** | 0,196 | 0,336 | 0,090 | 0,330 | 0,223 | | | | | | | | | |
| ***7-Need for cognition*** | 0,185 | 0,338 | 0,090 | 0,105 | 0,051 | 0,066 | | | | | | | | |
| ***8-Need for material resources*** | 0,041 | 0,156 | 0,364 | 0,397 | 0,092 | 0,270 | 0,080 | | | | | | | |
| ***9-Need for reality*** | 0,137 | 0,216 | 0,234 | 0,249 | 0,293 | 0,163 | 0,144 | 0,079 | | | | | | |
| ***10-Need for simplicity*** | 0,181 | 0,266 | 0,365 | 0,343 | 0,088 | 0.105 | 0,291 | 0,196 | 0,196 | | | | | |
| ***11-Need for touch*** | 0,087 | 0,069 | 0,102 | 0,076 | 0,106 | 0,038 | 0,090 | 0,119 | 0,629 | 0,115 | | | | |
| ***12-Need to evaluate*** | 0,230 | 0,283 | 0,222 | 0,317 | 0,139 | 0,210 | 0,242 | 0,175 | 0,183 | 0,206 | 0,091 | | | |
| ***13-Neuroticism*** | 0,212 | 0,080 | 0,105 | 0,147 | 0,077 | 0,115 | 0,178 | 0,188 | 0,105 | 0,049 | 0,126 | 0,194 | | |
| ***14-Sense of uniqueness*** | 0,118 | 0,333 | 0,230 | 0,410 | 0,179 | 0,252 | 0,119 | 0,169 | 0,211 | 0,219 | 0,062 | 0.332 | 0,074 | |

Table 20 Factor loadings and cross loadings

| | EXTR | OPEN | INVOL | DFUP | IPCA | N4A | N4C | N4M | N4R | N4S | N4T | N2E | NEUR | SOU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXTR1 | **0,93** | 0,15 | 0,00 | 0,07 | 0,04 | 0,16 | 0,16 | 0,01 | 0,02 | -0,12 | -0,09 | 0,16 | -0,20 | 0,09 |
| EXTR2 | **0,94** | 0,15 | 0,07 | 0,12 | 0,07 | 0,18 | 0,13 | 0,04 | 0,02 | -0,14 | -0,07 | 0,19 | -0,15 | 0,07 |
| EXTR3 | **0,92** | 0,16 | 0,08 | 0,12 | 0,04 | 0,16 | 0,16 | 0,02 | 0,06 | -0,17 | -0,07 | 0,21 | -0,17 | 0,09 |
| OPEN1 | 0,17 | **0,91** | 0,22 | 0,35 | 0,17 | 0,29 | 0,23 | 0,13 | 0,20 | -0,22 | 0,07 | 0,24 | -0,05 | 0,24 |
| OPEN2 | 0,17 | **0,88** | 0,15 | 0,23 | 0,08 | 0,28 | 0,32 | 0,12 | 0,17 | -0,20 | 0,03 | 0,23 | -0,05 | 0,24 |
| OPEN3 | 0,11 | **0,87** | 0,17 | 0,27 | 0,16 | 0,25 | 0,22 | 0,11 | 0,21 | -0,20 | 0,05 | 0,16 | -0,03 | 0,23 |
| INVO1 | 0,05 | 0,15 | **0,85** | 0,32 | 0,17 | 0,06 | -0,08 | 0,28 | 0,14 | -0,27 | 0,11 | 0,10 | 0,12 | 0,15 |
| INVO2 | 0,03 | 0,12 | **0,86** | 0,28 | 0,20 | 0,04 | -0,05 | 0,32 | 0,20 | -0,19 | 0,09 | 0,13 | 0,07 | 0,15 |
| INVO3 | 0,06 | 0,18 | **0,87** | 0,34 | 0,22 | 0,09 | -0,05 | 0,25 | 0,19 | -0,29 | 0,06 | 0,15 | 0,08 | 0,20 |
| INVO4 | 0,01 | 0,11 | **0,81** | 0,29 | 0,19 | 0,08 | -0,10 | 0,27 | 0,12 | -0,16 | 0,07 | 0,09 | 0,08 | 0,12 |
| INVO5 | 0,07 | 0,27 | **0,80** | 0,38 | 0,22 | 0,09 | -0,04 | 0,27 | 0,22 | -0,31 | 0,05 | 0,19 | 0,07 | 0,21 |
| DFUP1 | 0,12 | 0,31 | 0,24 | **0,78** | 0,29 | 0,22 | 0,10 | 0,15 | 0,21 | -0,32 | 0,00 | 0,20 | 0,10 | 0,27 |
| DFUP2 | 0,10 | 0,26 | 0,37 | **0,66** | 0,22 | 0,22 | -0,01 | 0,29 | 0,16 | -0,23 | 0,03 | 0,21 | 0,06 | 0,32 |
| DFUP3 | 0,09 | 0,17 | 0,28 | **0,75** | 0,34 | 0,23 | -0,06 | 0,33 | 0,17 | -0,11 | 0,01 | 0,19 | 0,11 | 0,21 |
| DFUP4 | 0,05 | 0,19 | 0,09 | **0,52** | 0,23 | 0,12 | 0,08 | 0,14 | 0,18 | -0,10 | 0,09 | 0,13 | 0,03 | 0,12 |
| DFUP5 | 0,07 | 0,22 | 0,30 | **0,77** | 0,30 | 0,24 | -0,03 | 0,30 | 0,20 | -0,19 | 0,07 | 0,20 | 0,13 | 0,31 |
| DFUP6 | 0,04 | 0,26 | 0,32 | **0,74** | 0,34 | 0,23 | -0,03 | 0,24 | 0,19 | -0,16 | 0,05 | 0,15 | 0,10 | 0,25 |
| DFUP7 | 0,05 | 0,13 | 0,36 | **0,69** | 0,29 | 0,23 | -0,10 | 0,36 | 0,15 | -0,17 | 0,05 | 0,16 | 0,14 | 0,22 |
| DFUP8 | 0,13 | 0,27 | 0,20 | **0,78** | 0,29 | 0,23 | 0,07 | 0,19 | 0,17 | -0,23 | -0,02 | 0,18 | 0,06 | 0,25 |
| IPCA1 | 0,07 | 0,14 | 0,17 | 0,29 | **0,80** | 0,19 | 0,03 | 0,05 | 0,37 | -0,11 | -0,11 | 0,09 | 0,00 | 0,15 |
| IPCA2 | 0,05 | 0,15 | 0,20 | 0,37 | **0,92** | 0,18 | -0,00 | 0,07 | 0,29 | -0,06 | -0,09 | 0,09 | 0,03 | 0,14 |
| IPCA3 | 0,04 | 0,13 | 0,23 | 0,40 | **0,92** | 0,20 | -0,06 | 0,10 | 0,26 | -0,06 | -0,08 | 0,11 | 0,09 | 0,15 |
| IPCA4 | 0,03 | 0,12 | 0,24 | 0,37 | **0,92** | 0,18 | -0,06 | 0,09 | 0,27 | -0,05 | -0,09 | 0,12 | 0,10 | 0,12 |
| N4A1 | 0,13 | 0,22 | 0,03 | 0,20 | 0,17 | **0,89** | -0,05 | 0,20 | 0,13 | -0,01 | -0,03 | 0,14 | 0,09 | 0,15 |
| N4A2 | 0,16 | 0,33 | 0,16 | 0,36 | 0,22 | **0,83** | 0,07 | 0,25 | 0,26 | -0,11 | -0,02 | 0,18 | 0,09 | 0,24 |
| N4A3 | 0,17 | 0,24 | 0,06 | 0,22 | 0,14 | **0,89** | -0,04 | 0,19 | 0,12 | -0,03 | 0,03 | 0,13 | 0,11 | 0,18 |
| N4A4 | 0,17 | 0,24 | 0,02 | 0,25 | 0,18 | **0,89** | -0,02 | 0,21 | 0,12 | 0,01 | -0,03 | 0,16 | 0,09 | 0,17 |
| N4C1 | -0,12 | -0,21 | 0,03 | -0,01 | 0,01 | -0,01 | **0,68** | 0,04 | -0,07 | 0,18 | 0,04 | -0,13 | 0,09 | -0,04 |
| N4C2 | -0,11 | -0,17 | 0,02 | -0,01 | 0,03 | 0,01 | **0,74** | 0,02 | -0,02 | 0,20 | 0,06 | -0,13 | 0,11 | 0,00 |
| N4C3 | -0,10 | -0,17 | 0,08 | 0,01 | 0,01 | 0,05 | **0,65** | 0,10 | -0,07 | 0,18 | 0,09 | -0,07 | 0,12 | 0,02 |
| N4C4 | -0,18 | -0,26 | 0,04 | 0,02 | 0,02 | -0,02 | **0,78** | 0,05 | -0,04 | 0,20 | 0,09 | -0,14 | 0,16 | -0,02 |
| N4C5 | -0,12 | -0,21 | 0,04 | 0,01 | 0,02 | 0,01 | **0,74** | 0,03 | -0,10 | 0,17 | 0,04 | -0,19 | 0,10 | 0,00 |
| N4C6 | -0,08 | -0,25 | 0,02 | -0,03 | 0,02 | 0,00 | **0,77** | 0,06 | -0,07 | 0,17 | 0,00 | -0,16 | 0,08 | -0,04 |
| N4MR1 | 0,01 | 0,10 | 0,33 | 0,31 | 0,09 | 0,24 | -0,08 | **0,91** | 0,03 | -0,14 | 0,07 | 0,10 | 0,17 | 0,13 |
| N4MR2 | 0,05 | 0,12 | 0,27 | 0,29 | 0,09 | 0,24 | -0,07 | **0,90** | 0,07 | -0,14 | 0,07 | 0,11 | 0,13 | 0,14 |
| N4MR3 | -0,00 | 0,12 | 0,30 | 0,31 | 0,09 | 0,16 | -0,04 | **0,88** | 0,06 | -0,13 | 0,11 | 0,09 | 0,14 | 0,11 |
| N4MR4 | 0,05 | 0,14 | 0,26 | 0,34 | 0,03 | 0,24 | -0,04 | **0,85** | 0,04 | -0,13 | 0,12 | 0,15 | 0,15 | 0,15 |
| N4R1 | -0,11 | 0,04 | 0,06 | -0,01 | -0,07 | -0,03 | -0,04 | 0,03 | **0,00** | 0,06 | 0,48 | 0,02 | 0,02 | 0,02 |
| N4R2 | -0,01 | 0,15 | 0,14 | 0,16 | 0,25 | 0,11 | 0,05 | 0,04 | **0,71** | 0,00 | 0,16 | 0,09 | -0,01 | 0,15 |
| N4R3 | -0,10 | 0,05 | 0,09 | 0,07 | 0,00 | -0,02 | -0,01 | 0,00 | **0,12** | 0,06 | 0,45 | 0,00 | 0,07 | 0,13 |
| N4R4 | -0,01 | -0,17 | -0,17 | -0,21 | -0,19 | -0,15 | 0,03 | -0,03 | **-0,59** | 0,07 | 0,17 | -0,04 | 0,02 | -0,08 |
| N4R5 | -0,01 | 0,12 | 0,17 | 0,15 | 0,20 | 0,13 | 0,03 | 0,07 | **0,68** | -0,03 | 0,12 | 0,06 | -0,03 | 0,09 |
| N4R6 | -0,12 | -0,08 | 0,00 | -0,06 | -0,11 | -0,04 | -0,19 | 0,01 | **-0,36** | 0,18 | 0,41 | -0,04 | 0,09 | -0,04 |
| N4S1 | -0,05 | -0,03 | -0,14 | -0,13 | -0,01 | 0,00 | -0,13 | -0,06 | -0,01 | **0,59** | 0,04 | -0,04 | 0,03 | -0,06 |
| N4S2 | -0,14 | -0,18 | -0,33 | -0,32 | -0,05 | -0,11 | -0,10 | -0,23 | -0,08 | **0,69** | 0,02 | -0,15 | -0,05 | -0,19 |
| N4S3 | -0,12 | -0,14 | -0,18 | -0,09 | -0,03 | 0,03 | -0,18 | -0,06 | 0,00 | **0,73** | 0,07 | -0,09 | -0,01 | -0,06 |
| N4S4 | -0,12 | -0,20 | -0,15 | -0,12 | -0,05 | 0,00 | -0,26 | -0,09 | -0,08 | **0,76** | 0,15 | -0,09 | 0,01 | -0,04 |
| N4S5 | -0,12 | -0,22 | -0,30 | -0,36 | -0,12 | -0,12 | -0,17 | -0,16 | -0,14 | **0,78** | 0,07 | -0,16 | 0,00 | -0,18 |
| N4T1 | -0,08 | 0,05 | 0,07 | 0,03 | -0,10 | -0,02 | -0,01 | 0,10 | -0,07 | 0,06 | **0,88** | -0,02 | 0,11 | 0,02 |
| N4T2 | -0,06 | 0,05 | 0,11 | 0,01 | -0,09 | -0,01 | -0,06 | 0,08 | -0,08 | 0,10 | **0,84** | -0,01 | 0,09 | 0,04 |
| N4T3 | -0,06 | 0,06 | 0,06 | 0,07 | -0,06 | -0,03 | -0,06 | 0,05 | -0,06 | 0,09 | **0,74** | 0,03 | 0,07 | 0,03 |
| N4T4 | -0,06 | 0,06 | 0,08 | 0,04 | -0,08 | 0,01 | -0,01 | 0,14 | -0,03 | 0,09 | **0,87** | 0,01 | 0,11 | 0,03 |
| N4T5 | -0,09 | 0,00 | 0,04 | 0,04 | -0,10 | -0,04 | -0,16 | 0,06 | -0,13 | 0,14 | **0,77** | -0,02 | 0,10 | -0,01 |
| N4T6 | -0,04 | 0,05 | 0,07 | 0,06 | -0,05 | 0,02 | -0,02 | 0,08 | -0,03 | 0,06 | **0,79** | 0,03 | 0,10 | 0,04 |
| N2E1 | 0,15 | 0,11 | 0,15 | 0,21 | 0,08 | 0,13 | 0,06 | 0,12 | 0,06 | -0,08 | 0,02 | **0,76** | 0,16 | 0,19 |
| N2E2 | 0,14 | 0,20 | 0,17 | 0,20 | 0,13 | 0,12 | 0,12 | 0,05 | 0,09 | -0,05 | 0,04 | **0,77** | 0,08 | 0,21 |
| N2E3 | 0,05 | 0,10 | 0,13 | 0,18 | 0,09 | 0,11 | 0,02 | 0,12 | 0,08 | 0,00 | 0,06 | **0,66** | 0,15 | 0,12 |
| N2E4 | 0,14 | 0,24 | 0,13 | 0,22 | 0,09 | 0,18 | 0,09 | 0,17 | 0,12 | -0,10 | -0,02 | **0,75** | 0,12 | 0,26 |
| N2E5 | 0,18 | 0,14 | -0,03 | 0,05 | 0,01 | 0,05 | 0,32 | -0,02 | -0,02 | -0,24 | -0,09 | **0,50** | -0,01 | 0,08 |
| NEUR1 | -0,23 | -0,10 | 0,06 | 0,10 | 0,05 | 0,06 | -0,13 | 0,12 | -0,08 | -0,01 | 0,08 | 0,07 | **0,82** | 0,04 |
| NEUR2 | -0,11 | -0,01 | 0,11 | 0,11 | 0,05 | 0,09 | -0,13 | 0,15 | -0,05 | 0,00 | 0,11 | 0,14 | **0,88** | 0,09 |
| NEUR3 | -0,13 | -0,11 | 0,07 | 0,11 | 0,06 | 0,08 | -0,13 | 0,16 | -0,06 | -0,04 | 0,07 | 0,15 | **0,84** | 0,01 |
| NEUR4 | -0,19 | 0,00 | 0,08 | 0,12 | 0,06 | 0,12 | -0,13 | 0,15 | 0,00 | 0,03 | 0,13 | 0,12 | **0,86** | 0,06 |
| SOU1 | 0,06 | 0,19 | 0,15 | 0,20 | 0,10 | 0,13 | -0,00 | 0,08 | 0,12 | -0,07 | 0,00 | 0,18 | 0,03 | **0,67** |
| SOU2 | 0,10 | 0,21 | 0,18 | 0,31 | 0,12 | 0,17 | -0,01 | 0,14 | 0,13 | -0,11 | 0,06 | 0,21 | 0,05 | **0,79** |
| SOU3 | 0,14 | 0,20 | 0,04 | 0,14 | 0,03 | 0,11 | 0,22 | 0,04 | 0,01 | -0,25 | -0,05 | 0,15 | 0,01 | **0,53** |
| SOU4 | 0,03 | 0,19 | 0,13 | 0,29 | 0,14 | 0,21 | -0,03 | 0,10 | 0,15 | -0,06 | 0,02 | 0,20 | 0,08 | **0,77** |
| SOU5 | 0,03 | 0,18 | 0,18 | 0,26 | 0,14 | 0,14 | -0,01 | 0,13 | 0,12 | -0,06 | 0,02 | 0,20 | 0,05 | **0,78** |

EXTR- *Extraversion*; OPEN-Openness; INVOL-Involvement; DFUP- *Desire for unique products*; IPCA-Intention to purchase customised apparel; N4A- *Need for arousal*; N4C- *Need for cognition*; N4M- *Need for material resources*; N4R- *Need for reality*; N4S- *Need for simplicity*; N4T- *Need for touch*; N2E- *Need to evaluate*; NEUR- *Neuroticism*; SOU- *Sense of uniqueness*

Considering the results of the reliability and validity analyses of constructs, *need for reality* and its indicators were removed from the model, since the overall results indicate values much below the threshold values, along with *p* values indicating lack of statistical significance.

As suggested by Joseph F. Hair et al. (2014) the indicators with loadings bellow 0.70 were removed from the model to find if their elimination contributes to the increase of composite reliabilities and AVE. In the case of the indicators from *desire for unique product*s, *need for cognition*, *need for simplicity* and s*ense of uniqueness*, the elimination of indicators bellow 0.70 does not contribute significantly to improve composite reliability and AVE. In fact, all these constructs already present acceptable values. The exception happens in the case of indicator N2E5 from *need to evaluate*, which by being eliminated, the AVE value increases (which was below the suggested threshold value), from 0.481 to 0.591. The final values of internal consistency reliability and convergent validity are presented in Table 21.

Table 21 Final measures of reliability and validity

| | *Cronbach's Alpha* | *Composite Reliability* | *Average Variance Extracted (AVE)* |
|---|---|---|---|
| ***Extraversion*** | 0.922 | 0,950 | 0,864 |
| ***Openness*** | 0.867 | 0,918 | 0,789 |
| ***Apparel involvement*** | 0.895 | 0,922 | 0,704 |
| ***Desire for unique products*** | 0.860 | 0,891 | 0,510 |
| ***Intention to purchase*** | 0.914 | 0,940 | 0,798 |
| ***Need for arousal*** | 0.899 | 0,929 | 0,766 |
| ***Need for cognition*** | 0.822 | 0,871 | 0,531 |
| ***Need for material resources*** | 0.907 | 0,934 | 0,781 |
| ***Need for simplicity*** | 0.768 | 0,837 | 0,508 |
| ***Need for touch*** | 0.900 | 0,923 | 0,667 |
| ***Need to evaluate*** | 0.779 | 0,852 | 0,591 |
| ***Neuroticism*** | 0.879 | 0,914 | 0,727 |
| ***Sense of uniqueness*** | 0.761 | 0,838 | 0,513 |

## 5.3.2 Structural model (Inner model)

After the assessment of the measurement model it is possible to proceed to the assessment of the structural model (also called inner model in PLS-SEM), which involves examining the model's predictive capabilities and the relationships between the constructs (Joseph F. Hair, Hult, et al., 2014). A summary of the criteria for the analyses of the inner model is presented in Table 22.

Table 22 Criteria for Assessing Inner Models (PLS)

| | |
|---|---|
| | ***Assessment of effects*** |
| ***Path Coefficients*** | Represent the hypothesised relationships among constructs. Path coefficients closer to 1 (-1 and +1) indicate strong relationships between constructs (Joseph F. Hair, Hult, et al., 2014; Henseler et al., 2009) |
| | ***Predictive Relevance*** |
| ***$R^2$*** | This coefficient gives the amount of explained variance of each endogenous latent variable. $R^2$ range from 0 to 1, higher levels indicate higher levels of predictive accuracy (Henseler, Ringle, & Sarstedt, 2012) |
| ***Effect size $f^2$*** | Calculates changes in the $R^2$ value when a specific exogenous construct is omitted from the model. Values of 0.02, 0.15 and 0.35 can be viewed as a gauge of whether a predictor latent variables has a small, medium or large effect at the structural level (J. Cohen, 1988; Joseph F. Hair, Hult, et al., 2014) |
| ***Predictive Relevance $Q^2$*** | Represents a measure of how well observed values are reconstructed by the model and its parameter estimates. The proposed threshold value $Q^2 > 0$ (Chin, 2010; Henseler et al., 2009) |
| ***Relative Predictive Relevance $q^2$*** | Measures the predictive relevance's ($Q^2$) relative impact. Values of 0.02, 0.15 and 0.35 reveal a small, medium or large predictive relevance (Joseph F. Hair, Hult, et al., 2014) |

Before starting to assess the structural model results, an analysis of collinearity among the structural model latent variables must be performed. Collinearity analysis is recommended because the estimation of path coefficients in the structural model is based on ordinary least squares (OLS) regressions of each endogenous latent variable on its corresponding predecessor constructs. The path coefficients might be biased in OSL regressions if the estimation involves significant levels of collinearity (Joseph F. Hair, Hult, et al., 2014).

The variance inflation factor (VIF) is the metric used to assess collinearity and values above 5 are considered indicators of collinearity (Joe F. Hair et al., 2011).

Table 23 presents the VIF values, which are all lower than 5, revealing that there are no collinearity problems among constructs.

Table 23 Collinearity Assessment (VIF)

| | *Intention to purchase* | *Apparel involvement* | *Desire for unique products* | *Need for simplicity* | *Need for touch* | *Need for cognition* | *Need to evaluate* | *Sense of uniqueness* |
|---|---|---|---|---|---|---|---|---|
| ***Extraversion*** | 1.126 | | | | | | 1.000 | 1.036 |
| ***Openness*** | 1.357 | | | | | 1.000 | | |
| ***Apparel involvement*** | 1.334 | | | | | | | |
| ***Desire for unique products*** | 1.440 | | | | | | | |
| ***Intention to purchase*** | | | | | | | | |
| ***Need for arousal*** | 1.262 | | | | | | | |
| ***Need for cognition*** | 1.226 | | | 1.000 | | | | |
| ***Need for material resources*** | 1.268 | 1.022 | | | | | | |
| ***Need for simplicity*** | 1.271 | | | | | | | |
| ***Need for touch*** | 1.063 | | | | | | | |
| ***Need to evaluate*** | | | | | 1.000 | | | |
| ***Neuroticism*** | 1.118 | | | | | | | 1.036 |
| ***Sense of uniqueness*** | | 1.022 | 1.000 | | | | | |

In PLS-SEM the criteria to assess the structural model differ from the classic approach of CB-SEM, so standard procedures are not applied. The first step is to assess the effects, through the path coefficients which represent the hypothesised relationships among constructs. By examining path coefficients values and their statistic significant is possible to conclude if an underlying hypothesised relationship is supported or not by the data. Path coefficients closer to 1 (-1 and +1) indicate strong relationships (Joseph F. Hair, Hult, et al., 2014). In this study paths coefficients with higher values are the ones connecting Desire for unique product to Intention to purchase and *Sense of uniqueness* to *Desire for unique products*. Table 24 shows all the 21 hypotheses proposed in this study, highlighting the 14 hypotheses that are supported. For a different view, Figure 6 presents the structural model results, with path coefficients and the hypotheses supported in a visual diagram. These results will be discussed in chapter 6.

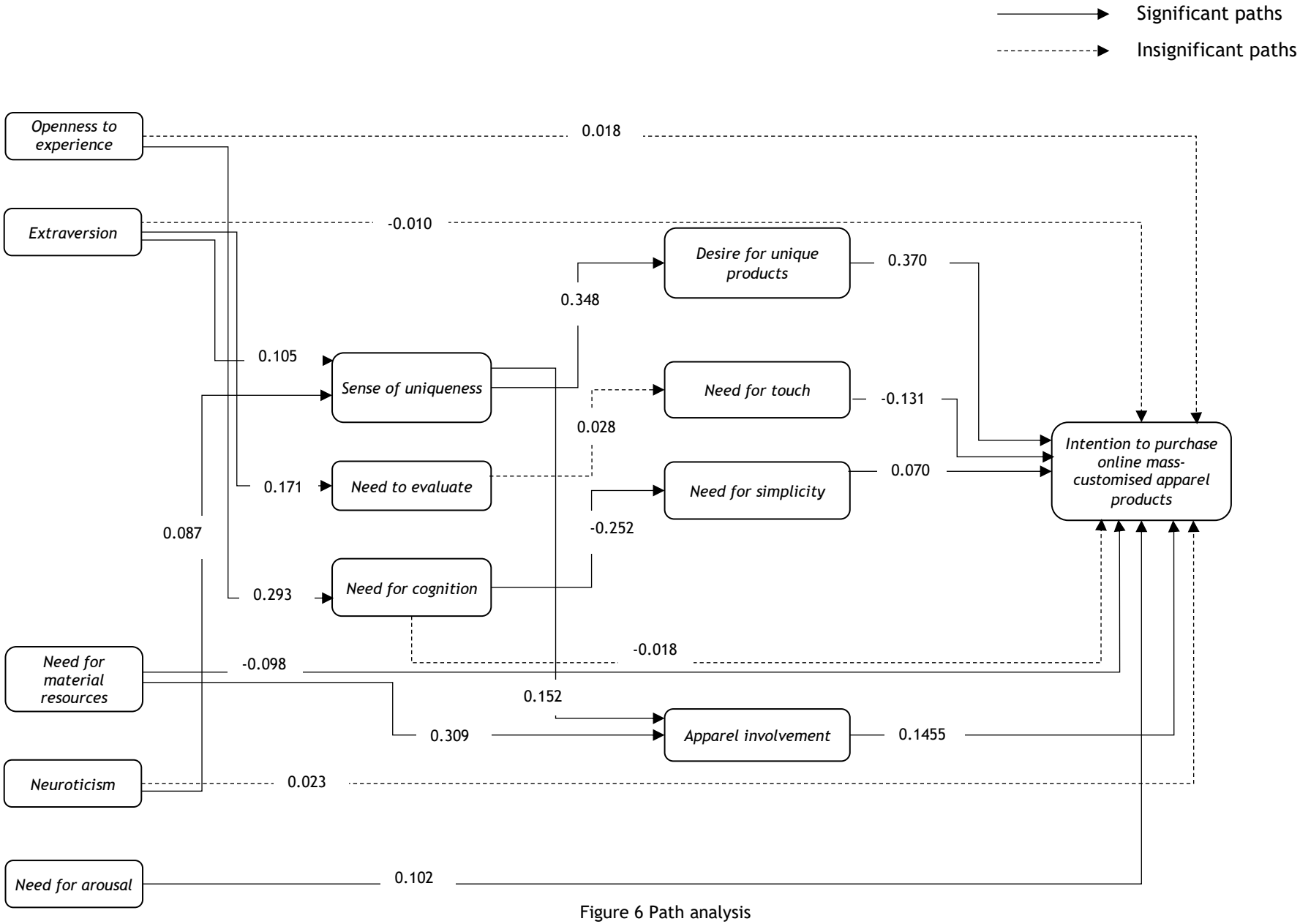


Figure 6 Path analysis

Table 24 Hypotheses Tests Results

| *Hypotheses* | *Path Coefficient* | *95% Confidence Intervals* | *t-value* | *ρ value** | *Support of Hypothesis* |
|---|---|---|---|---|---|
| *H1: Need for touch has a negative effect on intention to purchase online mass-customised apparel products* | -0.131 | [-0.198; -0.060] | 3.578 | 0.000 | Supported |
| *H2: Desire for unique products has a positive effect on intention to purchase online mass-customised apparel products* | 0.370 | [0.296; 0.446] | 9.678 | 0.000 | Supported |
| *H3:Need for simplicity has a negative effect on intention to purchase online mass-customised apparel products* | 0.070 | [0.002; 0.137] | 2.018 | 0.044 | Supported |
| *H4: Need for reality has a negative effect on intention to purchase online mass-customised apparel products* | - | - | - | - | - |
| *H5: Apparel involvement has a positive effect intention to purchase online mass-customised apparel products* | 0.145 | [0.069; 0.219] | 3.818 | 0.000 | Supported |
| *H6: Sense of uniqueness has a positive effect in the desire for unique products* | 0.348 | [0.285; 0.414] | 10.675 | 0.000 | Supported |
| *H7: Sense of uniqueness has a positive effect in apparel involvement* | 0.152 | [0.085; 0.222] | 4.354 | 0.000 | Supported |
| *H8:Need to evaluate has a positive effect in need for touch* | 0.028 | [-0.074; 0.129] | 0.531 | 0.595 | Not supported |
| *H9: Need to evaluate has a positive effect in need for reality* | - | - | - | - | |
| *H10: Need for cognition has a negative effect on need for simplicity* | -0.252 | [-0.317; -0.197] | 8.220 | 0.000 | Supported |
| *H11: Need for cognition has a positive effect on intention to purchase online mass-customised apparel products* | -0.018 | [-0.087; 0.052] | 0.521 | 0.602 | Not Supported |
| *H12: Openness to experience has a positive effect on intention to purchase online mass-customised apparel products* | 0.018 | [-0.055; 0.092] | 0.475 | 0.635 | Not Supported |
| *H13: Openness to experience has a positive effect on need for cognition* | 0.293 | [-0.360; 0.230] | 8.802 | 0.000 | Supported |
| *H14: Extraversion has a positive effect on intention to purchase online mass-customised apparel products* | -0.010 | [-0.078; 0.057] | 0.273 | 0.785 | Not Supported |
| *H15: Extraversion has a positive effect on need to evaluate* | 0.171 | [0.101; 0.247] | 4.697 | 0.000 | Supported |

| *Hypotheses* | *Path Coefficient* | *95% Confidence Intervals* | *t-value* | *ρ value** | *Support of Hypothesis* |
|---|---|---|---|---|---|
| *H16: Extraversion has a positive effect on sense of uniqueness* | 0.105 | [0.037; 0.179] | 2.880 | 0.004 | Supported |
| *H17: Neuroticism has a negative effect on sense of uniqueness* | 0.087 | [-0.019; 0.163] | 1.982 | 0.047 | Supported |
| *H18: Neuroticism has a negative effect on intention to purchase online mass-customised apparel products* | 0.023 | [-0.045; 0.092] | 0.641 | 0.522 | Not Supported |
| *H19: Need for material resources has a positive effect on apparel involvement* | 0.309 | [0.250; 0.367] | 10.231 | 0.000 | Supported |
| *H20: Need for material resources has a positive effect intention to purchase online mass-customised apparel products* | -0.098 | [-0.167; -0.028] | 2.759 | 0.006 | Supported |
| *H21: Need for arousal has a positive effect on intention to purchase online mass-customised apparel products* | 0.102 | [0.032;0.174] | 2.871 | 0.004 | Supported |

*The current study considers the value of *p*=0.05 the limit in judging whether the relationship is considered to be significant or not; based on 5000 bootstrap samples

The indirect, direct, and total effects of the independent constructs on the dependent ones were also examined, since they allow to explore the differential impact of different driver constructs on a criterion one.

Table 25 shows the direct, indirect and total effects of the predictors in the main dependent variable, *intention to purchase online mass-customised apparel products*.

Table 25 Direct. Indirect and Total Effects on Intentions to Purchase

| *Construct* | *Direct* | *t-value* | *Indirect* | *t-value* | *Total* | *t-value* |
|---|---|---|---|---|---|---|
| ***Extraversion*** | **-0.010** | 0.280ns | **0.015** | 2.439* | **0.006** | 0.164ns |
| ***Openness*** | **0.018** | 0.475ns | **-0.010** | 0.974ns | **0.007** | 0.202ns |
| ***Neuroticism*** | **0.023** | 0.641ns | **0.013** | 1.845ns | **0.036** | 1.031ns |
| ***Need for material resources*** | **-0.098** | 2.759** | **0.045** | 3.455** | **-0.053** | 1.505ns |
| ***Need for arousal*** | **0.102** | 2.871** | **-** | - | **0.102** | 2.871** |
| ***Sense of uniqueness*** | **-** | - | **0.151** | 7.725** | **0.151** | 7.725** |
| ***Need to evaluate*** | **-** | - | **-0.004** | 0.533ns | **-0.004** | 0.533ns |
| ***Need for cognition*** | **-0.018** | 0.521ns | **-0.018** | 1.872ns | **-0.036** | 1.018ns |
| ***Apparel involvement*** | **0.145** | 3.818** | - | - | **0.145** | 3.818** |
| ***Desire for unique products*** | **0.370** | 9.678** | - | - | **0.370** | 9.678** |
| ***Need for touch*** | **-0131** | 3.578** | - | - | **-0.131** | 3.578** |
| ***Need for simplicity*** | **0.070** | 2.018* | - | - | **0.070** | 2.018* |

*Significant at the 0.05 level; ** Significant at the 0.001 level; ns - non-significant

Along with the analyse of path coefficients, itis also important to analyse the coefficient of determination, R square ($R^2$). This coefficient is a measure of the model's predictive accuracy and gives the amount of explained variance for each endogenous latent variable. $R^2$ range from 0 to 1 and higher levels indicate higher levels of predictive accuracy, although no rule of thumb can be established of what is an acceptable $R^2$ value, since it depends of the field and complexity of the study (Joseph F. Hair, Hult, et al., 2014).

As shown in Table 26, R square values range from 0.001 to 0.209. In the consumer behaviour discipline, Henseler et al. (2012) consider $R^2$ values of 0.25 high. The main dependent variable in the current model is consumers' intentions to purchase online customised apparel products with a $R^2$ value of 0.209, indicating that the theoretical model explained a moderate amount of variance of that construct.

Table 26 Explained Variance of the Endogenous Constructs

| *Endogenous Constructs* | *$R^2$* |
|---|---|
| *Intention to purchase* | **0.209** |
| *Apparel involvement* | 0.132 |
| *Desire for unique products* | 0.121 |
| *Need for simplicity* | 0.063 |
| *Need for touch* | 0.001 |
| *Need for cognition* | 0.086 |
| *Need to evaluate* | 0.029 |
| *Sense of uniqueness* | 0.015 |

The analyse of path coefficients and of the coefficient of determination have been the two analyses most employed to assess model quality when conducting PLS-SEM analysis, as reported by Joe F. Hair et al. (2012) in their review on PLS studies. However, several authors (e.g. Joseph F. Hair, Hult, et al., 2014; Henseler et al., 2009; Marcoulides & Chin, 2013) recommend the use of additional metric to assess the structural model quality and its predictive validity, namely the $f^2$ effect size, the predictive relevance ($Q^2$) and the relative predicted relevance ($q^2$).

The $f^2$ effect size is a measure that calculates changes in the $R^2$ value when a specific exogenous construct is omitted from the model. With this measure, it is possible to evaluate whether the omitted construct has a substantive impact on the endogenous construct. Guidelines to interpret the effect size results are provided by J. Cohen (1988), where 0.02, 0.15 and 0.35 represent small, medium and large effects of the exogenous latent variable.

Table 27 presents the effects size in relation to the endogenous constructs, expressing only small effects ranging from 0.02 to 0.138. Furthermore, the results show that dropping the

majority of constructs would not have a major impact in reducing the variance explained in the target endogenous construct, with exception for *desire for unique products* (0.120) and *sense of uniqueness* (0.138) which present values closer to 0.15.

Table 27 Relative Explanatory Power Effect Size

| | $f^2$ *in relation to* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ***Sense of uniqueness*** | ***Need to evaluate*** | ***Need for cognition*** | ***Apparel involvement*** | ***Desire for unique products*** | ***Need for touch*** | ***Need for simplicity*** | **Intention to purchase** |
| ***Extraversion*** | 0.011 | **0.030** | - | - | - | - | - | 0.000 |
| ***Openness*** | - | - | **0.094** | - | - | - | - | 0.000 |
| ***Neuroticism*** | 0.007 | - | - | - | - | - | - | 0.001 |
| ***Need for material*** | - | - | - | **0.108** | - | - | - | 0.010 |
| ***Need for arousal*** | - | - | - | - | - | - | - | 0.010 |
| ***Sense of uniqueness*** | - | - | - | **0.026** | ***0.138*** | - | - | - |
| ***Need to evaluate*** | - | - | - | - | - | 0.001 | - | - |
| ***Need for cognition*** | - | - | - | - | - | - | **0.068** | 0.000 |
| ***Apparel involvement*** | - | - | - | - | - | - | - | **0.020** |
| ***Desire for unique products*** | - | - | - | - | - | - | - | ***0.120*** |
| ***Need for touch*** | - | - | - | - | - | - | - | **0.020** |
| ***Need for simplicity*** | - | - | - | - | - | - | - | 0.005 |

In addition, to assess predictive accuracy, researchers must examine the model's predictive relevance by means of the Stone-Geisser's $Q^2$ (Geisser, 1974; Stone, 1974). This is a predictive sample reuse technique that uses the blindfolding procedure. With blindfolding part of the data is omitted for a particular block of indicators during parameter estimations and then attempts to estimate the omitted part using the estimated parameters (Chin, 2010). $Q^2$ values indicate the extent to which the prediction is successful. If $Q^2 > 0$, the model has predictive relevance and if $Q^2 < 0$ there is a lack of predictive relevance (Chin, 2010; Henseler et al., 2009). Furthermore, $Q^2$ can be calculated using the cross-validated redundancy or the cross-validated communality approach. The cross-validated redundancy is the approach recommend by Joseph F. Hair, Hult, et al. (2014) since it builds on the path model estimates of both the structural

model and the measurement model of data prediction, while the cross-validated redundancy uses only the construct scores estimated for the target endogenous construct.

Table 28 presents the predictive relevance of the endogenous constructs, obtained through the blindfolding procedure[3]. With exception to *need for touch* ($Q^2$=-0.000), all the other endogenous construct present values >0, which are indicators of predictive relevance.

Table 28 Predictive Relevance

| *Endogenous Constructs* | $Q^2$ |
|---|---|
| ***Apparel involvement*** | 0.089 |
| ***Desire for unique products*** | 0.060 |
| ***Intention to purchase*** | 0.160 |
| ***Need for cognition*** | 0.043 |
| ***Need for simplicity*** | 0.026 |
| ***Need for touch*** | -0.000 |
| ***Need to evaluate*** | 0.013 |
| ***Sense of uniqueness*** | 0.006 |

Similar to $f^2$, the $Q^2$ can assess an individual construct's predictive relevance for the model by omitting selected inner model relationships and computing changes in the criterion's estimates ($q^2$). The $q^2$ effect size assess the relative predictive relevance, and values of 0.02, 0.15 and 0.35 indicate that an exogenous construct has a small, medium or large predictive relevance for a certain endogenous construct (Joseph F. Hair, Hult, et al., 2014).

In Table 29 it is possible to see that d*esire for unique products* has the largest effect size on *intention to purchase* ($q^2$=0.119), while *need for material resources* is the dependent variable with the most significant predictive relevance of *apparel involvement* ($q^2$=0.070).

[3] To apply the blindfolding procedure the omission distance (necessary to compute $Q^2$ ) should be between 5 and 10 and the number of valid observations divided by the omission distance should not be an integer (Chin, 2010; Ringle et al., 2015). The omission distance used was 9.

Table 29 Relative Predictive Relevance

| | $q^2$ *in relation to** | |
|---|---|---|
| | **Intention to Purchase** | ***Apparel involvement*** |
| ***Apparel involvement*** | 0.013 | - |
| ***Desire for unique product*** | **0.119** | - |
| ***Need for touch*** | 0.014 | - |
| ***Need for simplicity*** | 0.002 | - |
| ***Sense of uniqueness*** | - | 0.015 |
| ***Need for material resources*** | - | **0.070** |

*predictive relevance is only calculated to endogenous construct which have more than one predictor, in this case only Intention to purchase and *Apparel involvement*

The present study also proposes the existence of moderation effects. A moderation effect is when a moderator variable is expected to affect the strength of one specific relationship between two latent variables or even change the direction of relationships (Joseph F. Hair, Hult, et al., 2014).

Based on the literature three moderation effects were initially proposed: one from *desire for unique products* on the relationship between *Need for touch* and *intention to purchase online mass-customised apparel products* (H2a)(Figure 7) and from a*pparel involvement* on the relationships between n*eed for simplicity* (H5a)(Figure 8) and *need for reality* with *intention to purchase online mass-customised apparel products* (H5b). However, only two moderation effects were analysed, since *need for reality* was dropped from the model.

In Table 30 it is possible to observe that the hypotheses concerning moderation effect were not supported. Although comparing the path coefficients from n*eed for touch to intention to purchase online mass-customised apparel products (*Table 31), a small reduction of the negative effect exist, which goes in line with what was hypothesised.

In the case of the relationship between *need for simplicity* and *intention to purchase mass-customised apparel products*, a small reduction of the effect happens with the moderation effect from *apparel involvement*, but the hypothesised negative relation is not statistically supported (Table 31).

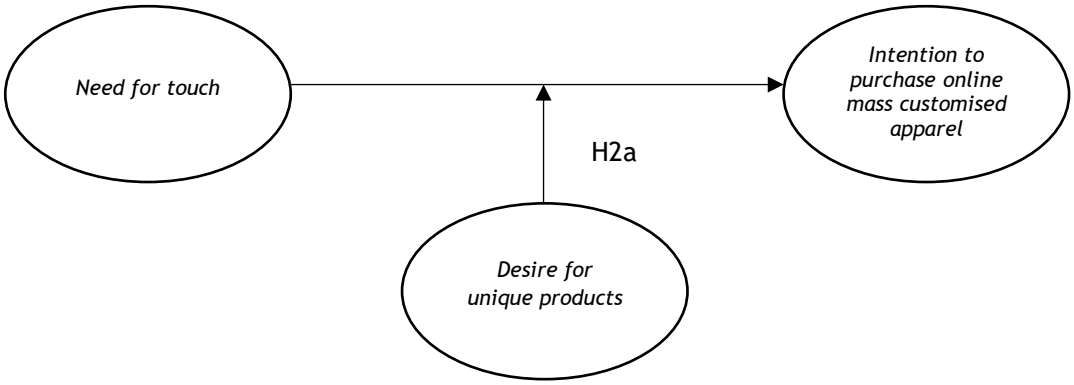


Figure 7 Moderation effect from *desire for unique products*

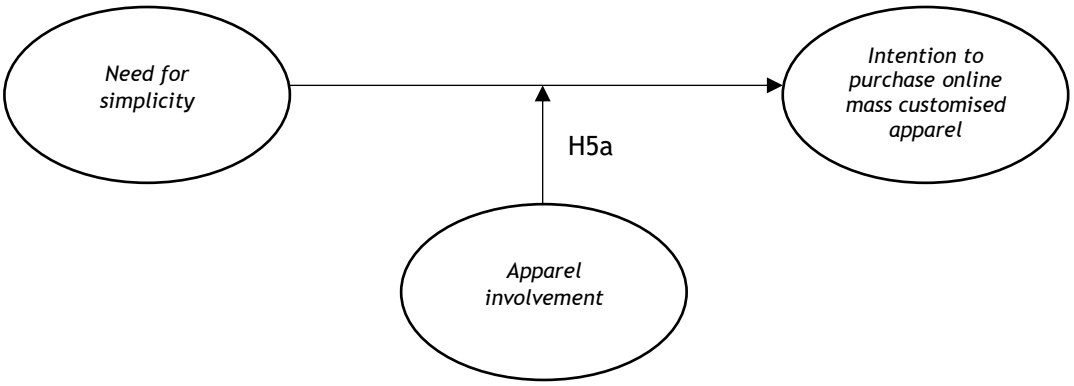


Figure 8 Moderation effect from *apparel involvement*

Table 30 Moderation effects

| ***Hypotheses*** | ***Path Coefficient*** | ***Percentile 95% Confidence Intervals*** | ***t-value*** | ***ρ value**** | ***Support of Hypothesis*** |
|---|---|---|---|---|---|
| *H2a: Desire for unique products will moderate the negative direct effect of need for touch on intention to purchase online mass-customised apparel products* | -0.048 | [-0.124; 0.028] | 1.250 | 0.211 | Not Supported |
| *H5a: Apparel involvement will moderate the negative effect of need for simplicity on intention to purchase online mass-customised apparel products* | 0.043 | [-0.031; 0.112] | 1.193 | 0.233 | Not Supported |

*The current study considers the value of *p*=0.05 the limit in judging whether the relationship is considered to be significant or not; based on 5000 bootstrap samples

Table 31 Path coefficient comparison

| *Hypotheses* | *Path Coefficient* | *Percentile 95% Confidence Intervals* | *t-value* | *ρ value** | *Support of Hypothesis* |
|---|---|---|---|---|---|
| *H1: Need for touch has a negative effect on intention to purchase online mass-customised apparel products* | -0.131 | [-0.198;-0.060] | 3.578 | 0.000 | Supported |
| *H1: Need for touch has a negative effect on intention to purchase online mass-customised apparel products*<br>**with moderation effect* | -0.125 | [-0.195; -0.054] | 3.512 | 0.000 | Supported |
| *H3: Need for simplicity has a negative effect on intention to purchase online mass-customised apparel products* | 0.070 | [0.002; 0.137] | 2.018 | 0.044 | Not supported |
| *H3: Need for simplicity has a negative effect on intention to purchase online mass-customised apparel products*<br>**with moderation effect* | 0.060 | [-0.011; 0.128] | 1.702 | 0.089 | Not Supported |

*The current study considers the value of *p*=0.05 the limit in judging whether the relationship is considered to be significant or not; based on 5000 bootstrap samples

One of the objectives of the present research was to investigate how the several hierarchical levels of traits contribute to explain intention to purchase mass customised apparel products. For that purpose, a hierarchical regression was also conducted using SPSS.

With the PLS-SEM structural equation model analysis it was possible to examine the relationships that exist among the variables in the model, while with the hierarchical regression was possible to analyse the incremental influence of the several levels of traits on the target variable, *intention to purchase online mass-customised products*. The same procedure was employed by several studies on the 3M model (e.g. Bone & Mowen, 2006; Carlson, Mowen, & Fang, 2009; Schneider & Vogt, 2012). The five elemental traits (openness, *extraversion*, *neuroticism*, *need for material resources* and *need for arousal*) were entered in Model 1, the compound traits (*sense of uniqueness*, *need for cognition* and *need to evaluate*) were entered in Model 2 and the situational traits (*desire for unique products*, *need for touch*, *need for simplicity* and *apparel involvement*) were entered in Model 3. Table 32 presents the results of the hierarchical regression. In Model 1 *openness to experience* (ß=0.112, p=0.002) and n*eed for arousal* (ß=0.154, p=0.000) are the statistically significant predictors of *intention to purchase online mass-customised products*. In Model 2 with the introduction of compound traits, elemental traits Openness and *need for arousal* remain relevant predictors, along with *sense of uniqueness* (ß=0.076, p=0.034). With the introduction of situational traits in Model 3, the elemental traits *openness to experience* (ß=0.025, p=0.493) and the compound *sense of uniqueness* (ß=-0.004, p=0.907) are no longer statistically significant predictors. *Need for*

*arousal* remains relevant (ß=0.101, p=0.004) as well as the four situational traits, d*esire for unique products* (ß=0.373, p=0.000), n*eed for touch* (ß=-0.131, p=0.000), n*eed for simplicity* (ß=0.076, p=0.029) and a*pparel involvement* (ß=0.148, p=0.000).

The variance explained by the Model 1 is only 5,5%, increasing to 6,6% in Model 2 and reaching 20.9% in Model 3.

Model 3 with all the hierarchical levels is the one that explained more variance in the target construct intention to purchase. Results show that the situational traits, added in Model 3 are the ones who most significantly contribute to explain *intention to purchase mass-customised apparel products.*

Table 32 Hierarchical regression for *Intention to purchase online mass-customised products*

| | *Model 1* | | | *Model 2* | | | *Model 3* | | |
|---|---|---|---|---|---|---|---|---|---|
| | ß | t-value | ρ value | ß | t-value | ρ value | ß | t-value | ρ value |
| ***Elemental traits*** | | | | | | | | | |
| *Openness to experience* | **0.112** | 3.140 | 0.002 | **0.102** | 2.687 | 0.007 | **0.025** | 0.687 | 0.493 |
| *Extraversion* | **0.017** | 0.494 | 0.622 | **0.011** | 0.322 | 0.748 | **-0.007** | -0.202 | 0.840 |
| *Neuroticism* | **0.056** | 1.580 | 0.114 | **0.036** | 1.019 | 0.309 | **0.023** | 0.693 | 0.489 |
| *Need for material resources* | **0.021** | 0.594 | 0.552 | **0.007** | 0.193 | 0.847 | **-0.101** | -2.900 | 0.004 |
| *Need for arousal* | **0.154** | 4.200 | 0.000 | **0.137** | 3.713 | 0.000 | **0.101** | 2.908 | 0.004 |
| ***Compound traits*** | | | | | | | | | |
| *Sense of uniqueness* | - | - | - | **0.076** | 2.123 | 0.034 | **-0.004** | -0.116 | 0.907 |
| *Need for cognition* | - | - | - | **-0.054** | -1.500 | 0.134 | **-0.016** | -0.462 | 0.644 |
| *Need to evaluate* | - | - | - | **0.054** | 1.506 | 0.132 | **0.002** | 0.045 | 0.964 |
| ***Situational traits*** | | | | | | | | | |
| *Desire for unique products* | - | - | - | - | - | - | **0.373** | 9.827 | 0.000 |
| *Need for touch* | - | - | - | - | - | - | **-0.131** | -4.108 | 0.000 |
| *Need for simplicity* | - | - | - | - | - | - | **0.076** | 2.189 | 0.029 |
| *Apparel involvement* | - | - | - | - | - | - | **0.148** | 4.144 | 0.000 |
| ***Explained variance $R^2$*** | **0.055** | | | **0.066** | | | **0.209** | | |
| ***R-Square Change*** | 0.055 | | 0.000 | 0.011 | | 0.018 | 0.143 | | 0.000 |

# Chapter 6 Discussion, Contributions, and Future Research

## 6.1 Introduction

This chapter presents the discussion of the findings arising from the empirical study, namely by discussing the hypotheses proposed. Furthermore, it presents the theoretical contributions and practical implications of the findings. Finally, the limitations of the study are identified and suggestions for future research are provided.

## 6.2 Discussion of Results

The main research objective of this study was to determine the effect of individual behavioural differences of *desire for unique products, need for touch, need for simplicity, need for reality* and *apparel involvement* on *intention to purchase online mass-customised apparel products*. Other research objectives concern: the assessment of two new constructs (n*eed for simplicity* and n*eed for reality)*, to evaluate the relationship between *desire for unique products* and n*eed for touch* in the apparel mass-customisation context, and empirically test the application of the hierarchy structure of traits from the Meta-theoretical Model of Motivation and Personality (3M) (Mowen, 2000).

Prior to the test of the hypothesised relationships, a descriptive analysis regarding online shopping behaviour and the measured traits was conducted, which revealed interesting insights, namely:

- From the total sample of 840 individuals, 632 (75.2%) have already bought apparel online. This result goes in line with recent data on the growing of online commerce of apparel products (eMarketer, 2015);
- A significant percentage (21.5%) of the consumers who had bought apparel online, have also bought customised apparel. In 2013, a survey conducted by Bain & Company, Inc. in a sample of 1000 online shoppers (Spaulding & Perry, 2013) found that 10% have already tried apparel customisation options, and between 25% to 30% were interested in doing it. Although the values of the present study represent a small percentage of consumers, comparing to Bain & Company, Inc. survey the results seem to reveal that consumers are becoming more aware and prone to the possibility to customise apparel products online;

- The *openness to experience* trait is the most relevant characteristic of online apparel consumers. Although online shopping is nowadays more common, it still represents a different shopping experience compared to brick and mortar stores, so it was expected to validate that online apparel shoppers have a higher disposition to try and experience new approaches, namely in customised apparel shopping (Bosnjak, Galesic, et al., 2007; Tsao & Chang, 2010);
- Other individual's relevant traits are the tendency to engage in evaluative behaviours and the perception of themselves as having unique characteristics. Regarding evaluative behaviours, customised apparel shoppers online scored high in the *need for touch*, which is somehow surprising since previous studies (e.g. Peck & Childers, 2003a; Peck & Wiggins, 2006) found that individuals with higher levels of need for touch have an overall tendency to shop through traditional channels where they can have physical contact with the product. A possible explanation to this result is that these consumers although usually avoid online shopping, may have been compelled to do it due to the impossibility to find the customised product in brick and mortar stores or because the purchase was not for themselves.

The descriptive analysis was followed by the assessment of the outer model, in which the validity and reliability of the majority of the scales were confirmed, with the exception for *need for reality*. This construct was dropped from the model due to validity and reliability issues and consequently the hypotheses proposed involving this construct were not considered for further analyses. Although this represented a drawback to the investigation outcome since this is one of the new constructs proposed, it represents also an opportunity for further research as we still believe that this dimension deserves additional investigation. However, its measurement needs a clear improvement, namely by applying a consistent method of development.

In the final step the structural relationships in the inner model (the proposed hypotheses) were evaluated. The initial five hypotheses proposed addressed the relationship among the situational traits: *need for touch*, *desire for unique products*, *need for simplicity*, *need for reality* and *apparel involvement*; and the surface trait i*ntention to purchase online mass-customised apparel products*. As referred previously, the *need for reality* trait was dropped out the model, so H4 and H9 were not tested.

The first hypothesis proposes a negative effect of *need for touch* on *intention to purchase mass-customised apparel products*, based on the evidences suggested by J. Cho, (2004), Levin et al., (2003) and Zhou et al., (2007). To the best of our knowledge the negative effect of *need for touch* was only studied in regular online apparel shopping (e.g. Almousa, 2011; Lim, 2003) but not in the context of mass-customised products. The existence of the negative relationship was

supported (ß=-0.131, ρ=0.000) confirming that consumer with higher *need for touch* have lower *intention to purchase online mass-customised apparel products*.

The second hypothesis predicted a positive effect of *desire for unique product*s on *intention to purchase online mass-customised apparel products*. Mass-customised products allow the expression of the consumer's need for uniqueness (Franke & Schreier, 2008; Schreier, 2006), so it seems reasonable to admit that these consumers strive to purchase unique product, such as customised apparel products, to fulfil their uniqueness need. The validation of this hypothesis (ß=0.370, ρ=0.000) follows previous findings on the context of mass-customisation, for example, J. Park et al. (2013), Kang and Kim (2012) and Latter et al. (2010) found that consumers with higher need for uniqueness expressed by the desire to acquire unique products and display higher purchase intentions toward mass-customised apparel. It is also relevant to highlight that *desire for unique products* was the construct with the most significant impact on intention to purchase, with a substantial size effect ($f^2$=0.120), which demonstrates its explanatory power.

Another hypothesis (H2a) proposed a possible moderation effect of d*esire for unique product*s on the relationship between n*eed for touch and intention to purchase online mass-customised apparel products* (H1). This hypothesis is related with one of the specific research objectives of the thesis by considering d*esire for unique products* and *need for touch* together in the same study since, to the best of our knowledge, *desire for unique products* has only been studied in mass-customisation research, and *need for touch* in studies concerning online apparel shopping. The moderation effect assumed that consumer's intention to purchase online mass-customised apparel products would be less negatively affected by *need for touch* if the *desire for unique products* is higher. The effect was not statistically supported (ß=-0.048, ρ=0.211), although it showed a very small negative effect the relationship between *need for touch* on intention from ß=-0.131 to ß=-0.125. With these results is not possible to conclude, that even consumers with high levels of *need for touch*, would be willing to purchase online mass-customised apparel because of the possibility to acquire unique products.

*Intention to purchase online mass-customised apparel products* was also proposed to be affected negatively by *need for simplicity* (H3). This hypothesis was found to be statistically supported (ß=0.070, ρ=0.044), although the direction of the relationship is inverse to what was initially proposed. The construct of *need for simplicity* was conceptualised as the individual's difference in the preference for simplicity versus complexity in multi choice environments. Since the process of developing a customised apparel product involves the selection of several elements and attributes through a number of steps (which can vary from site to site or from product to product), and in general is regarded as being a more complex process that regular shopping (Dellaert & Stremersch, 2005; Kang & Kim, 2012), it was hypothesised that consumers with higher levels on *need for simplicity* would avoid online mass-customisation, thus having lower *intention to purchase online mass-customised apparel products*. Though several studies on mass-customisation corroborate the negative relationship hypothesised (e.g. Matzler et al.,

2011; Moon et al., 2013; Piller et al., 2005), some explanations for the result found can be reasoned. Comparing the process of shopping in brick and mortar stores with online shopping in mass-customised platforms, consumers may find the process to be simpler, since in a regular store they have to search for the desired product, while in a mass-customised platform they can actually and automatically choose the characteristics of the desire product from a richly set of choices, making it easy to build the desired apparel product. Also, despite the fact that consumers with high *need for simplicity*, would commonly prefer simpler processes and less options, maybe these consumers have a different behaviour pattern in what respects to the specific context of online customised apparel shopping. This contradictory finding inspires future research opportunities.

It was also hypothesised that *apparel involvement* could moderate the negative effect of *need for simplicity* on *intentions to purchase online mass-customised apparel products* (the relationship discussed above). Previous research (e.g. H. Cho, 2007; Huffman & Kahn, 1998; Matzler et al., 2011; Moon et al., 2013) found that higher *apparel involvement*, expressed in more knowledge and interest for apparel products, lead consumers to perceive the process of mass-customisation as less complex, since they are more conscientious of their preferences and more easily defined them. However, despite previous indications, no statistically support was found to the hypothesis (H5a) (ß=0.043, ρ=0.233). Even so, it draws our attention to the fact that the relationship, which it was supposed to moderate, was found to be positive and not negative, as expected. The result of this moderation effect suggested another possible explanation for the inverse direction of H3. The respondents who present higher levels of *need for simplicity* may also be involved with apparel, thus having the knowledge and the capacity to better define their apparel preferences, and consequently having higher intention to purchase online mass-customised apparel products.

The fifth hypothesis (H5) proposed a positive effect of *apparel involvement* on *intention to purchase online mass-customised apparel products*. Consistent with existent literature (e.g. Halepete et al., 2009; O'Cass, 2000), the relationship was found be supported (ß=0.145, ρ=0.000). Individuals that consider apparel as meaningful and a central product in their life, seek for new and different styles provided by online mass-customisation.

The next hypotheses considered the effects between compound and situational traits, and also some direct effect on the surface trait, *intention to purchase online mass-customised apparel products*.

The sixth and seventh hypotheses (H6, H7) predicted, respectively, a positive effect of *sense of uniqueness* on the desire to have unique products and on *apparel involvement*. Both effects were supported (H6: ß=0.348, ρ=0.000 and H7: ß=0.152, ρ=0.000), with *sense of uniqueness* having a substantial effect size on *desire for unique products* ($f^2$=0.138). These results worth some attention since they provide support to hypotheses which were not previously empirically tested since they derived from the conceptual reflexion of the researcher based on existent literature readings. As initially anticipated, the current results suggest that consumers with a

high *sense of uniqueness*, meaning that they feel being unique or having distinctive characteristics from others, have a high desire for unique or customised apparel products, since it allows them to express their individuality. Furthermore, consumer with a high *sense of uniqueness* were found to be more involved with apparel products, probably because they have more interest in public display goods that show to others their unique and distinctive characteristics.

Hypothesis eight (H8) proposed a positive effect of *need to evaluate* on *need for touch*, based on previous research from Vieira (2012) which found *need to evaluate* to be positively associated with the instrumental dimension of *need for touch*. Current finding (ß=0.028, ρ=0.595) contradicts earlier literature, since no statistical support was found for the relationship. Although Vieira's ( 2012) findings, the present result is not totally unexpected since the literature on *need to evaluate* show that some individuals are compelled to make evaluations about all sort of objects or situations, even if they are not exposed to them frequently or do not possess extensively knowledge (W. B. G. Jarvis & Petty, 1996). So, maybe these consumers rely on the sense of touch exclusively for information acquisition and decision making, and do not have a tendency to engage in evaluative behaviours about everything.

The tenth (H10) and eleventh (H11) hypotheses are related with the compound trait *need for cognition*, and its effect on *need for simplicity* and *intention to purchase online mass-customised apparel products*, respectively. Only the effect on *need for simplicity* was supported (ß=-0.252, ρ=0.000). As expected, consumers more devoted to cognitive efforts and that enjoy complex tasks are the ones expressing less preference for simplicity. It was also proposed that *need for cognition* would had a positive effect on *intention to purchase online mass-customised apparel products*. This hypothesis (H11) advocated that consumer who prefer to engage in cognitive tasks have high intention to purchase mass-customised apparel products. The eleventh hypothesis (H11) was not statistically supported (ß=-0.018, ρ=0.605) and also the effect turns to be negative rather than positive.

Hypotheses on elemental traits (H13, H15, H16, H17, H19) proposed them as predictors of compound traits, but also of *intention to purchase online mass-customised apparel products* (H12, H14, H18, H20, H21).

*Openness to experience* was expected to be a major trait of individuals with high *need for cognition*. The effect was found to be positive and significant (ß=0.293, ρ=0.000). This result reinforces the findings from Cacioppo et al. (1996), Dollinger (2003), Mowen (2000) and Tuten and Bosnjak (2001b). Openness individuals are recognised by preferring new and intellectually stimulation environments, and consequently enjoy engaging in demanding cognitive activities.

*Extraversion* (H16) and n*euroticism* (H17) were proposed to have a positive and negative effect, respectively, on *sense of uniqueness*. Both hypotheses, were supported (H16: ß=0.105, ρ=0.004 and H17: ß=0.087, ρ=0.047). Considering these results is possible to conclude that individuals who feel they are unique and have special individual characteristics express a high willingness

to be involved with the social environment, but are more emotional instable and temperamental. It was expected that *neuroticism* produced a negative effect on the *sense of uniqueness* and not a positive one as was found in the current investigation, since previous studies identified *neuroticism* to be correlated to low self-esteem (Chamorro-Premuzic et al., 2011). Usually low self- esteem individuals to not believe in themselves and do not trust in their unique characteristics.

The fifth hypothesis (H15) proposes a positive effect of *extraversion* on *need to evaluate*, which was found to be statically supported (ß=0.171, ρ=0.000). Following Tuten and Bosnjak (2001a) findings, the result of this hypothesis reinforce the perception that extroverted, social and talkative individuals tend to engage in evaluative behaviours by the opportunity of social interaction and self-expression.

Regarding *need for material resources*, the nineteenth hypothesis (H19) proposes a positive relationship between *need for material resources* and *apparel involvement*. The effect was supported (ß=0.309, ρ=0.000) corroborating early literature (e.g. Browne & Kaldenberg, 1997; O'Cass, 2004). Is possible to conclude that individuals conveying high importance to material possessions, namely apparel, also present high levels of involvement with the product.

Hypotheses H12, H14, H18, H20 and H21 propose elemental traits o*penness to experience*, *extraversion*, *neuroticism*, *need for material resources* and *need for arousal* to have an effect on the surface trait *intention to purchase online mass-customised apparel products*. Only hypotheses H20 involving *need for material resources* (ß=-0.098, ρ=0.006) and H21 regarding *need for arousal* (ß=0.102, ρ=0.004) were found to be achieve statistical support. However, the supported effect of *need for material resources* was found to be negative. The findings may suggest that the consumers with higher *need for material resources* (materialistic) have also higher intention to purchase apparel products, however only from well established brands with recognised designs and not to purchase apparel products conceived or designed by themselves. In the case of *need for arousal*, the findings reflect individuals' tendency to seek for stimulating activities, that Fiore et al. (2004, 2001) had already linked to the individuals' perception of mass-customisation as an exciting experience to acquire products, and consequently express higher intention to purchase online mass-customised apparel products.

The effects of the other elemental traits, *openness to experience* (H12: ß=0.018, ρ=0.635), *extraversion* (H14: ß=0.010, ρ=0.785) and *neuroticism* (H18: ß=0.023, ρ=0.522) on *intention to purchase online mass-customised apparel products* were not supported statistically. The non-existence of effect from *openness to experience* on intention to engage in online social shopping was previously reported by Kang and Johnson (2015) in a different context. However the results contradict Bosnjak, Galesic, et al. (2007) that found small but significant effects of *openness to experience* on willingness to buy online. Probably, nowadays many respondents do not consider the online purchase of mass-customised products a new and different experience. Regarding the effects of *extraversion*, it seems natural to expect that more extravert individuals would prefer shop in brick and mortar stores and avoid online shopping, where the

degree of social interaction is clearly distinct. Although, the hypothesis was proposed based on previous findings from McElroy et al. (2007) which report that extraverts tend to avoid the use of internet for social purposed, but not to other activities like shopping. One possible explanation to the results found is that extraverts may have intention to shop online other types of products, but not apparel. The purchase of apparel is for many consumers still a social activity, which they like to share with their peers (Cyr, Hassanein, Head, & Ivanov, 2007; Hassanein & Head, 2007; H. Li et al., 1999).

In an overview of the results, from the twenty-four hypotheses, fourteen were statistically supported, but some end to be in the inverse direction of what was initially anticipated.

Additionally, to the SEM PLS-Path approach, a hierarchical regression was performed to address not only the relationships among the variables in the model but the incremental influence of the several traits in the intention to purchase, since the conceptual framework for the investigation is based on the existence of a hierarchical structure. The results of the hierarchal regression, show that including all the three levels of traits (Model 3) the model explains 20,9% of the variance in *intention to purchase online mass-customised apparel products*, with different level of contribution for each hierarchical level: elemental traits contribute to explain 5,5% of the variance, the compound with 1,1% and the situational 14,3%. These results indicate that only the situational traits, *desire for unique products*, *need for touch*, *need for simplicity* and *apparel involvement* have a significant impact on intention to purchase. Is not totally an unexpected result since the situational traits are narrow traits considered predispositions to behave within a specific context closer to the related behaviour. A somehow surprising result was the low explained variance attributed to the compound traits, *sense of uniqueness*, *need for cognition* and *need to evaluate*, because according to the hierarchy structure principles, they should have explained more variance than elemental traits. However, the introduction of these compound traits in the hierarchy was only supported by their relationship with situational traits, which was found to be significant (see hypotheses discussion), but without previous strong empirical supported of their relationship with the surface trait, *intention to purchase online mass-customised apparel products*. These exploratory results end by revealing the lack of capability of these traits to predict additional variance in *intention to purchase online mass-customised apparel products*.

Analysing the pattern of relationships between elemental traits, compound traits, situational traits to surface traits, the following general conclusions can be draw:

- *Intention to purchase online mass-customised apparel products* (surface trait) is primarily predicted positively by the *desire for unique products*, but also by *apparel involvement*, *need for simplicity* and *need for arousal*. Therefore, consumers with higher purchase intentions for online customised products are those expressing a high desire to acquire unique products, are more involved with apparel products, have a preference for simplicity in multi-choice environments and a have higher desire for stimulating and exciting experiences.

- *Intention to purchase online mass-customised apparel products* was also negatively affected by *need for touch*. The lack of possibility to have physical contact with apparel products continue to be perceived as a negative aspect of online shopping, despite the possibility offered by mass-customisation to acquire unique and differentiated products
- Broader traits (elemental and compound) have a small contribution to predict intention to purchase online customised products, but worth to be considered by the relationships between them and each of the situational traits
- The level of explained variance in intention to purchase by consumer behavioural characteristics, was 20,9% ($R^2$= 0.209), what constitutes an acceptable value in this context, since the literature points a vast number of other factors (e.g. risk and trust beliefs, social factors and product and experience perceptions) which influence consumer behaviour in online apparel mass-customisation.

## 6.3 Research Contributions and implications

The results of this research have both theoretically and managerial contributions. From a theoretical perspective, this study has made some significant contributions. First the meta-theoretical model of motivation and personality (3M) that guided the study, was found to be a useful structuring framework, and was never used in this specific context. The model offers the advantage of a hierarchical approach to personality, that considers the basic elemental and compound traits that account for situational traits and surface level traits. As stated before, the present research was the first to apply this methodological framework to study online consumer behaviour in apparel mass-customisation.

Two new constructs concerning personal characteristics were proposed, *need for simplicity* and *need for reality*, constituting a first step on the evaluation of the potential use of these situational traits in the context of online apparel mass-customisation.

In terms of managerial contributions and implications, this study enlightens consumer personal characteristics (broad and narrow personality traits) as antecedents of intentions to purchase online apparel mass-customised products. Individuals' personality differences are crucial to develop and implement marketing strategies, as market segmentation. Segmentation based on motivations, attitudes, perceptions and personality has become more relevant, and provide an alternative to the traditional demographic-based segmentation (Carson et al., 2013). The findings provide new insights to the industry on what characteristics they must look for and address, and what factors they should concentrate on stimulate in order to improve the intention to purchase online mass-customised apparel.

Personal consumer characteristics in the form of personal behavioural traits play a relevant role in the apparel mass-customisation context, especially the *desire for unique products*, the

level of *apparel involvement* and the desire for stimulation and excitement, which can be helpful to direct companies pursuing a mass-customisation strategy in the apparel sector to improve results.

## 6.4 Limitations and Future Research

As any research project, this study contains some limitations. The limitations will be presented along with future research directions, since some of the proposed future research lines were drawn upon the acknowledgment of the limitations.

The first limitation arises from the fact that the present research follows exclusively a quantitative approach to the study of personal characteristics concerning intention to purchase online apparel mass-customised products. It is considered that an additional qualitative component to the research may have been useful to find new or mutated traits currently absent in the literature and to better understand the most relevant consumer's characteristics identified in the literature. However, despite the interest, this was not done due to the difficulties in finding a suitable sample willing to participate in the qualitative research.

The data used for the study was based on a convenience sample of the Portuguese population, it constitutes the second major limitation, since it constrains the conclusions and inhibits the generalisation of the results, that should not be made without extreme caution.

Another limitation can be drawn from the data collection process. In the survey, only brief descriptions about online apparel mass-customisation were provided, and for those online consumers not familiarised with customisation it may be hard to understand the experience and the outcome product. Future research should consider the use of a stimulus (e.g. images or a website), similar to those used in previous studies about online shopping (e.g. Childers, Carr, Peck, & Carson, 2001; H. Kim & Lennon, 2010; H.-H. Lee & Chang, 2011; Ulrich et al., 2003) since it provides the respondent with the opportunity to fell a real mass customisation experience, which could generate distinct, and possibly more reliable results, since direct experience generators of self-focused attention are better predictors of behaviours (Millar & Millar, 1996).

In the present study, only online apparel shoppers were considered. A direction for future research would be a comparison of online shoppers and non-shoppers. Non-shopper's characteristics and traits may differ from shoppers, with the consequent impact on intention to purchase online mass-customised apparel products.

Issues relating to the measurement of some scales may also drive additional discussion and a note for attention. In the present study two new constructs were proposed, specifically the *need for simplicity* and the *need for reality*. Since no valid instruments existed to measure the new constructs, several items were adapted from other scales and others developed. This

constitutes one major limitation of the study, since they were not developed using the procedures suggested by Churchill (1979). As it is understandable, this was not done out of ignorance, but due to the limited time available to complete the thesis research. The items emerged from the conceptualisation of the constructs and were inspired by other items, to some extent, from related constructs. Perhaps, as a consequence of the "soft" approach to the scale development, *need for reality* ended by not fulfilling the validity and reliability criteria necessary to be included in the structural model.

It is a fact that topics on interactivity, image stimulus, avatars and the use of virtual simulation in apparel online retail, are in the forefront of current research (e.g. Alves & Soares, 2013; D.-E. Kim & LaBat, 2012, 2013; McCormick & Livett, 2012; Mull, Wyss, Moon, & Lee, 2015), so it appears of major importance for future research to proceed with the study of consumer personal characteristics, namely *need for reality* toward technological features.

The present findings involving *need for simplicity* suggest that consumers driven by simplicity in their life's and in decision making, consider online apparel mass-customised to be simple, contradicting early literature. Further studies should be conducted to validate the novelty of the current findings.

Another aspect that must be further investigated concerns the relationship between *need for touch* and the *desire for unique products*. The present study proposed, to the best of our knowledge, a never approached relationship between the two constructs. It was projected that the possibility to acquire unique products would lead consumers to overlook the impossibility to touch them, although the hypothesis was not supported.

In this study only the hierarchically approach of traits from the Meta-theoretical Model of Motivation and Personality (3M) Mowen (2000) was used. However, the full model considers the existent of a comparator (e.g. previous purchasing) and an outcome (e.g. actual behaviour) assessed trough measures of a direct response to the stimulus. Future research may assess the complete model considering previous behaviour and actual online purchase behaviour as the final outcome variable.

## 6.5 Final Remarks

This thesis contributes to online mass customisation literature by suggesting a conceptual framework based on a hierarchy of traits of Meta-theoretical Model of Motivation and Personality (3M) from Mowen (2000), to study intention to purchase online mass-customised apparel products.

Overall the research objectives of this study were achieved. The main traits proposed to affect intention, *desire for unique products*, *need for touch*, *need for simplicity*, *need for reality* and

*apparel involvement*, were found to be relevant predictors, with exception for the *need for reality*.

The attempt to introduce two new traits, *need for simplicity* and *need for reality*, revealed interesting insights about their importance for future online mass-customisation research, despite their small relevance on predicting intention to purchase.

The full hierarchical model of traits was useful to explain 20% of the variance of intention to purchase online mass-customised apparel products. This can be considered a good result in this field of study, bearing in mind that exists a plenty of other factors, consumer and not consumer related, which affect consumer behaviour.

It is believed that this thesis provides a valuable contribution to better understand the role of individual behavioural differences on consumer's intention to purchase online mass-customised apparel products, and to highlight the need for further research on this field.

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# Appendices

# Appendix 1 Adapted scales

Table 33 Adapted scales

| *Nº* | *Original Scale* | *Adapted Scale* | *Source* |
|---|---|---|---|
| | **Desire for Consumer Unique Products** | | |
| ***1*** | I am very attracted to rare objects | I am very attracted to rare apparel | Adapted from (Lynn & Harris, 1997a) |
| ***2*** | I tend to be a fashion leader rather than a fashion follower | I tend to be a fashion leader rather than a fashion follower | |
| ***3*** | I am more likely to buy a product if it is scarce | I am more likely to buy apparel if it is scarce | |
| ***4*** | I would prefer to have products custom-made rather than ready-made | I would prefer to have apparel custom-made rather than ready-made | |
| ***5*** | I enjoy having things that others do not | I enjoy having apparel that others do not | |
| ***6*** | I rarely pass up the opportunity to order custom features on the products I buy | I rarely pass up the opportunity to order custom features on the apparel I buy | |
| ***7*** | I like to try new products and services before others do | I like to try new apparel before others do | |
| ***8*** | I enjoy shopping at stores that carry merchandise that is different and unusual | I enjoy shopping at stores that carry apparel that is different and unusual | |
| | ***Need for touch*** | | |
| ***1*** | I place more trust in products that can be touched before purchase | I place more trust in apparel that can be touched before purchase | Adapted from *Need for touch*: instrumental dimension (Peck & Childers, 2003) |
| ***2*** | I feel more comfortable purchasing a product after physically examining it | I feel more comfortable purchasing apparel after physically examining it | |
| ***3*** | If I can't touch a product in the store, I am reluctant to purchase the product | If I can't touch an apparel product in the store, I am reluctant to purchase the product | |
| ***4*** | I feel more confident making a purchase after touching a product | I feel more confident making a purchase after touching an apparel product | |
| ***5*** | The only way to make sure a product is worth buying is to actually touch it | The only way to make sure an apparel product t is worth buying is to actually touch it | |
| ***6*** | There are many products that I would only buy if I could handle them before purchase | There are many apparel products that I would only buy if I could handle them before purchase | |
| | ***Need for simplicity*** | | |
| ***1*** | I would like to simplify my life as much as I can | I would like to simplify my life as much as I can | Adapted from *Need for simplicity* Liu et al. (2012) |
| ***2*** | I would like to keep things simple | I like to dress in a simple way | |

| *Nº* | *Original Scale* | *Adapted Scale* | *Source* |
|---|---|---|---|
| ***3*** | I prefer have a limit number of choices | In apparel purchase I prefer have a limit number of choices | Developed |
| ***4*** | I feel confused when presented with a large number of options | I feel confused when presented with a large number of apparel products options | |
| ***5*** | I generally prefer things that are simple or regularly predictable to things that are complex, irregular and whimsical | When choosing apparel I generally prefer simple or regularly predictable combinations than complex, irregular and whimsical | |
| | ***Need for reality*** | | |
| ***1*** | I need more information about this item to get a clear idea (image) of what it is | I need to have a clear picture of what a virtual apparel product look in reality | Adapted from Mental Intangibility (Laroche, Yang, McDougall, & Bergeron, 2005) |
| ***2*** | I have a clear picture of this item | A clear vision of the final fit of an apparel product is important to me | |
| ***3*** | This is not the sort of item that is easy to picture | Virtual apparel is not the sort of product easy to picture as real | |
| | ***Fashion involvement*** | | |
| ***3*** | I am very much involved with fashion clothing | I am very much involved with apparel | Adapted from (Jones & Kim, 2010) |
| ***4*** | I consider fashion clothing to be a central part of my life | I consider apparel to be a central part of my life | |
| ***5*** | I am an experienced user of fashion clothing | I am an experienced user of apparel | |

# Appendix 2 Translated scales

Table 34 Translated scales: Elemental traits

| *Nº* | *English Scale* | *Portuguese Scale* | *Source* |
|---|---|---|---|
| | ***Openness to experience*** | | |
| ***1*** | Frequently feel highly creative | Sinto-me frequentemente altamente criativo (a) | (Mowen, 2000) |
| ***2*** | Find novel solutions | Sou capaz de encontrar novas soluções | |
| ***3*** | Imaginative | Imaginativo(a) | |
| | ***Extraversion*** | | |
| ***1*** | Bashful when with people | Envergonhado (a) na presença de outras pessoas | (Mowen, 2000) |
| ***2*** | Shy | Tímido (a) | |
| ***3*** | Quiet when with people | Calado (a) na presença de outras pessoas | |
| | ***Neuroticism*/Emotional instability** | | |
| ***1*** | Moody more than others | Mais mal-humorado (a) do que os outros | (Mowen, 2000) |
| ***2*** | Temperamental | Temperamental | |
| ***3*** | Testy more than others | Mais irritável do que os outros | |
| ***4*** | Emotions go way up and down | Tenho variações emocionais bruscas | |
| | ***Need for material resources*** | | |
| ***1*** | Enjoy buying expensive things | Gosto de comprar coisas caras | (Mowen, 2000) |
| ***2*** | Enjoy owning luxurious things | Gosto de ter coisas luxuosas | |
| ***3*** | Acquiring valuable things is important to me | Adquirir coisas valiosas é importante para mim | |
| ***4*** | Like to own nice things more than most people | Gosto de ter coisas boas mais do que a maioria das pessoas | |
| | ***Need for arousal*** | | |
| ***1*** | Drawn to experiences with an element of danger | Atraído (a) por experiências com elementos de perigo | (Mowen, 2000) |
| ***2*** | Like the new and different more than the tried and true | Prefiro o novo e diferente ao já experimentado e conhecido | |
| ***3*** | Seek an adrenaline rush | Procuro a sensação de adrenalina | |
| ***4*** | Enjoy taking risks more than others | Gosto de correr riscos mais que os outros | |

Table 35 Translated scales: Compound traits

| *Nº* | *Original Scale* | *Translated Scale* | *Source* |
|---|---|---|---|
| | ***Sense of uniqueness*** | | |
| ***1*** | As people get to know me more, they begin to recognize my special features | À medida que as pessoas me conhecem apercebem-se das minhas características especiais | (Şimşek & Yalınçetin, 2010) |
| ***2*** | I feel unique | Sinto-me único (a) | |
| ***3*** | I cannot think of many special characteristics that distinguish me from others (R) | Não consigo pensar em muitas características especiais que me distingam dos outros | |
| ***4*** | I think that the characteristics that make me up are different from others' | Penso que as características que me definem são diferentes dos outros | |
| ***5*** | I feel that some of my characteristics are completely unique to me | Sinto que algumas das minhas características são unicamente minhas | |
| | ***Need for cognition*** | | |
| ***1*** | Learning new ways to think doesn't excite me very much | Aprender novas formas de pensar não me estimula muito | (Mowen, 2000) |
| ***2*** | I only think as hard as I have to | Esforço-me a pensar apenas o mínimo exigido | |
| ***3*** | I feel relief rather than satisfaction after completing a task that required a lot of mental effort | Sinto-me mais aliviado (a) do que satisfeito (a) depois de completar uma tarefa que exigiu muito esforço mental | |
| ***4*** | I don't like the responsibility of handling a situation that requires a lot of thinking | Não gosto da responsabilidade de ter de lidar com uma situação que exija pensar muito | |
| ***5*** | Thinking is not my idea of fun | Pensar não é a minha ideia de divertimento | |
| ***6*** | I would rather do something that requires little thought than something that is sure to challenge my thinking abilities | Prefiro fazer algo que requere pouco esforço mental do que algo que desafie as minhas capacidades cognitivas | |
| | ***Need to evaluate*** | | |
| ***1*** | I form opinions about everything | Sinto necessidade de formar opiniões sobre tudo | (Bosnjak, Galesic, et al., 2007) |
| ***2*** | It is very important to me to hold strong opinions | Ter opiniões firmes é muito importante para mim | |
| ***3*** | I like to have strong opinions even when I am not personally involved | Gosto de ter opiniões firmes mesmo não estando pessoalmente envolvido (a) | |
| ***4*** | I have many more opinions than the average person | Tenho muito mais opiniões do que uma pessoa comum | |
| ***5*** | I only form strong opinions when I have to (R) | Apenas formo opiniões firmes quando a isso sou obrigado | |

Table 36 Translate scales: situational traits

| *Nº* | *Original Scale* | *Translated Scale* | *Source* |
|---|---|---|---|
| | **Desire for Consumer Unique Products** | | |
| *1* | I am very attracted to rare apparel | Sou muito atraído (a) por vestuário fora do vulgar | Adapted from (Lynn & Harris, 1997a) |
| *2* | I tend to be a fashion leader rather than a fashion follower | Normalmente sou mais uma pessoa lidera os outros no estilo de vestuário, do que uma pessoa que segue a o estilo definido por outros | |
| *3* | I am more likely to buy apparel if it is scarce | É mais provável comprar vestuário se for de uma edição limitada | |
| *4* | I would prefer to have apparel custom-made rather than ready-made | Eu iria preferir vestuário confecionado de acordo com os meus desejos, do que vestuário já confecionado | |
| *5* | I enjoy having apparel that others do not | Gosto de ter vestuário que os outros não têm | |
| *6* | I rarely pass up the opportunity to order custom features on the apparel I buy | Raramente deixo passar a oportunidade de ter características personalizadas no vestuário que compro | |
| *7* | I like to try new apparel before others do | Gosto de experimentar vestuário novo antes dos outros | |
| *8* | I enjoy shopping at stores that carry apparel that is different and unusual | Gosto de comprar em lojas que têm vestuário diferente e pouco comum | |
| | ***Need for touch*** | | |
| *1* | I place more trust in apparel that can be touched before purchase | Tenho mais confiança em vestuário que pode ser tocado antes da compra | Adapted (Peck & Childers, 2003) |
| *2* | I feel more comfortable purchasing apparel after physically examining it | Sinto-me mais confortável a comprar vestuário se o puder examinar fisicamente antes | |
| *3* | If I can't touch an apparel product in the store, I am reluctant to purchase the product | Se em loja não puder tocar numa peça de vestuário, sinto-me inseguro (a) em comprá-la | |
| *4* | I feel more confident making a purchase after touching an apparel product | Sinto-me mais confiante a comprar vestuário depois de o tocar | |
| *5* | The only way to make sure an apparel product t is worth buying is to actually touch it | A única forma de garantir que vale a pena comprar uma peça de vestuário é tocar-lhe | |
| *6* | There are many apparel products that I would only buy if I could handle them before purchase | Há muitas peças de vestuário que compraria se pudesse tocar-lhes antes da compra | |
| | ***Need for simplicity*** | | |
| *1* | I would like to simplify my life as much as I can | Eu procuro simplificar a minha vida o mais possível | Adapted from Liu et al. (2012) |
| *2* | I like to dress in a simple way | Gosto de vestir-me de forma simples | |

| *Nº* | *Original Scale* | *Translated Scale* | *Source* |
|---|---|---|---|
| *3* | In apparel purchase I prefer have a limit number of choices | Na compra de vestuário prefiro ter um número limitado de escolhas | Developed |
| *4* | I feel confused when presented with a large number of apparel products options | Sinto-me confuso(a) quando confrontado (a com um grande número de opções de peças de vestuário | |
| *5* | When choosing apparel I generally prefer simple or regularly predictable combinations than complex, irregular and whimsical | Geralmente na escolha de vestuário prefiro combinações simples e previsíveis, do que complexas, e imprevisíveis | |
| | | ***Need for reality*** | |
| *1* | I need to have a clear picture of what a virtual apparel product look in reality | Preciso de ter uma visão clara de como é que uma peça de vestuário virtual é na realidade | Adapted from (Laroche et al., 2005) |
| *2* | A clear vision of the final fit of an apparel product is important to me | É importante para mim ter uma visão clara de como uma peça de vestuário desenvolvida *on-line* assenta no meu corpo | |
| *3* | Virtual apparel is not the sort of product easy to picture as real | O vestuário apresentado de forma virtual não é o tipo de produto que me seja fácil de visualizar como real | |
| *4* | Image interactivity technologies (e.g. 2D and 3D images, avatars, zoom) are important to me in order to better visualize the real product | Para mim as tecnologias de interação de imagem (ex: imagens em 2D e 3D, avatars, zoom) são importantes para conseguir visualizar o produto real | |
| *5* | I easily form a real representation of a virtual product even with few information (R) | Eu concebo facilmente uma representação virtual de um produto mesmo com pouca informação | Developed |
| *6* | I do not mind to make an extra effort to get a more real picture of the virtual product | Não me importo de fazer um esforço extra para obter uma imagem mais real de um produto virtual | |
| | | ***Apparel involvement*** | |
| *1* | I have strong interest in clothes | Tenho um grande interesse em vestuário | (Goldsmith, 2002) |
| *2* | Clothes are very important to me | O vestuário é muito importante para mim | |
| *3* | I am very much involved with apparel | Eu estou muito envolvido (a) com o vestuário | |
| *4* | I consider apparel to be a central part of my life | Considero o vestuário como uma parte central da minha vida | (Jones & Kim, 2010) |
| *5* | I am an experienced user of apparel | Sou um utilizador (a) de vestuário experiente | |

Table 37 Translated Scales: Surface traits

| *Nº* | *Original Scale* | *Translated Scale* | *Source* |
|---|---|---|---|
| | **Intention to buy online mass customised apparel products** | | |
| *1* | I find interesting purchasing customised apparel products on-line | Acho interessante a compra de produtos de vestuário customizado *on-line* | Developed |
| *2* | If I have the chance, I will purchase customised apparel products on-line | Se tiver oportunidade, vou comprar produtos de vestuário customizado *on-line* | |
| *3* | I will try to purchase customised apparel products on-line in the near future | Vou tentar comprar produtos de vestuário customizado *on-line*, no futuro próximo | (Kang, 2008)<br>(Kang & Kim, 2012) |
| *4* | I plan to purchase customised apparel products on-line in the near future | Planeio comprar produtos de vestuário customizado *on-line*, no futuro próximo | |

# Appendix 3 Pre-test changes

Table 38 Scales changes after pre-test

| *Nº* | *Original Items* | *After pre-test* |
|---|---|---|
| | ***Openness to experience*** | |
| *1* | Sinto-me frequentemente altamente criativo (a) | Sinto-me com frequência muito criativo (a) |
| | ***Need to evaluate*** | |
| *2* | Ter opiniões firmes é muito importante para mim | Ter opiniões sólidas é muito importante para mim |
| *3* | Gosto de ter opiniões firmes mesmo não estando pessoalmente envolvido (a) | Gosto de ter opiniões sólidas mesmo não estando pessoalmente envolvido (a) |
| *5* | Apenas formo opiniões firmes quando a isso sou obrigado | Apenas formo opiniões sólidas quando a isso sou obrigado |
| | ***Desire for unique products*** | |
| *2* | Normalmente sou mais uma pessoa lidera os outros no estilo de vestuário, do que uma pessoa que segue a o estilo definido por outros | Como consumidor costumo ser mais um(a) líder de moda, do que um (a) seguidor(a) de moda |
| *3* | I am more likely to buy a product if it is scarce | Tenho mais tendência a comprar vestuário se este for de edição limitada |
| *4* | Eu iria preferir vestuário confecionado de acordo com os meus desejos, do que vestuário já confecionado | Preferiria ter vestuário feito à medida do que confecionado em série |
| *7* | Gosto de experimentar vestuário novo antes dos outros | Gosto de experimentar vestuário novo antes dos outros |
| *8* | Gosto de comprar em lojas que têm vestuário diferente e pouco comum | Gosto de comprar em lojas que têm vestuário diferente e pouco comum |
| | ***Need for touch*** | |
| *1* | Tenho mais confiança em vestuário que pode ser tocado antes da compra | Tenho mais confiança em vestuário que possa ser tocado antes da compra |
| *2* | Sinto-me mais confortável a comprar vestuário se o puder examinar fisicamente antes | Sinto-me mais confortável a comprar vestuário depois de o examinar fisicamente |
| *3* | Se em loja não puder tocar numa peça de vestuário, sinto-me inseguro (a) em comprá-la | Se não puder tocar uma peça de vestuário na loja, fico relutante em comprá-la |
| *5* | A única forma de garantir que vale a pena comprar uma peça de vestuário é tocar-lhe | A única maneira de me certificar se vale a pena comprar uma peça de vestuário é tocar-lhe |
| *6* | Há muitas peças de vestuário que compraria se pudesse tocar-lhes antes da compra | Há muitas peças de vestuário que só compraria se pudesse tocar-lhes antes da compra |
| | ***Need for simplicity*** | |
| *1* | Eu procuro simplificar a minha vida o mais possível | Procuro simplificar a minha vida o mais possível |
| *2* | Gosto de vestir-me de forma simples | Gosto de me vestir de forma simples |

| *Nº* | *Original Items* | *After pre-test* |
|---|---|---|
| *3* | Na compra de vestuário prefiro ter um número limitado de escolhas | Na compra de vestuário prefiro ter um número limitado de opções |
| *5* | Geralmente na escolha de vestuário prefiro combinações simples e previsíveis, do que complexas, e imprevisíveis | Na escolha de vestuário prefiro geralmente combinações simples e previsíveis, do que complexas e imprevisíveis |
| | ***Need for reality*** | |
| *2* | É importante para mim ter uma visão clara de como uma peça de vestuário desenvolvida *on-line* assenta no meu corpo | É importante para mim ter uma visão clara de como uma peça de vestuário virtual assenta no meu corpo |
| *3* | O vestuário apresentado de forma virtual não é o tipo de produto que me seja fácil de visualizar como real | O vestuário apresentado de forma virtual não é o tipo de produto que me seja fácil de visualizar como real |
| *4* | Para mim as tecnologias de interação de imagem (ex: imagens em 2D e 3D, avatars, zoom) são importantes para conseguir visualizar o produto real | Para mim as tecnologias de interação de imagem (ex: imagens em 2D e 3D, avatars, zoom) são importantes para conseguir visualizar melhor o produto real |
| *5* | Eu concebo facilmente uma representação virtual de um produto mesmo com pouca informação | Concebo facilmente uma representação real de uma peça de vestuário virtual mesmo com pouca informação |
| *6* | Não me importo de fazer um esforço extra para obter uma imagem mais real de um produto virtual | Não me importo de fazer um esforço extra para obter uma imagem mais real de uma peça de vestuário virtual |
| | Add note: "Entenda-se por peça de vestuário virtual, uma peça que não existe fisicamente, sendo apresentada através de imagens exemplificativas ou desenhos" | |
| | ***Intention to buy online customised apparel products*** | |
| *1* | Acho interessante a compra de produtos de vestuário customizado *on-line* | Acho interessante a compra de vestuário customizado *on-line* |
| *2* | Se tiver oportunidade, vou comprar produtos de vestuário customizado *on-line* | Se tiver oportunidade, vou comprar vestuário customizado *on-line* |
| *3* | Vou tentar comprar produtos de vestuário customizado *on-line*, no futuro próximo | Vou tentar comprar vestuário customizado *on-line*, no futuro próximo |
| *4* | Planeio comprar produtos de vestuário customizado *on-line*, no futuro próximo | Planeio comprar vestuário customizado *on-line*, no futuro próximo |

## Appendix 4 Questionnaire

# Comportamento do consumidor online de produtos de vestuário customizado

O meu nome é Liliana Ribeiro e sou aluna de doutoramento em Marketing e Estratégia, consórcio Universidade Beira Interior, Universidade de Aveiro e Universidade do Minho.

Neste questionário, pretende-se conhecer melhor as intenções de uso de uma plataforma on-line de customização de vestuário, através de características individuais do consumidor e da sua relação com a personalidade.A customização torna possível a participação do consumidor no desenvolvimento de uma peça de vestuário, através da escolha do modelo, cores, estampagens, componentes específicos como o tipo de mangas, decote, bolsos, ou mesmo a criação de uma peça por medida

Não existem respostas certas ou erradas.

O preenchimento não irá demorar mais de 10 minutos. A informação fornecida é anónima e confidencial. Seja sincero(a) nas suas respostas.

Nota: Caso necessite de algum esclarecimento adicional relativamente ao preenchimento do questionário, poderá fazê-lo através do e-mail: liliana.ribeiro@ubi.pt

Obrigada pela sua colaboração,

Existem 31 perguntas neste inquérito

## B1-Informação Sócio-Demográfica

**1 Indique o seu género ***

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Feminino
- ○ Masculino

**2 Indique a sua idade ***

Por favor, escreva aqui a sua resposta:

**3 Em que distrito reside habitualmente? ***

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Aveiro
- ○ Beja
- ○ Braga
- ○ Bragança
- ○ Castelo Branco
- ○ Coimbra
- ○ Évora
- ○ Faro
- ○ Guarda
- ○ Leiria
- ○ Lisboa
- ○ Portalegre
- ○ Porto
- ○ Santarém
- ○ Setúbal
- ○ Viana do Castelo
- ○ Vila Real
- ○ Viseu
- ○ R. A. Açores
- ○ R. A. Madeira

**4 ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Claramente urbano | Mais urbano que rural | Mais rural que urbano | Claramente rural | Não consigo classificar com clareza |
|---|---|---|---|---|---|
| O local onde vive é sobretudo urbano ou rural? | ○ | ○ | ○ | ○ | ○ |

**5 Indique a habilitação escolar mais elevada que concluiu ***

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ 1° Ciclo do ensino básico (Antiga 4ª classe)
- ○ 2° Ciclo do ensino básico (Antigo 6° ano)
- ○ 3° Ciclo do ensino básico (Antigo 9° ano)
- ○ Ensino secundário (Antigo 12° ano)
- ○ Curso profissional
- ○ Bacharelato
- ○ Licenciatura
- ○ Mestrado
- ○ Doutoramento
- ○ Pós- Doutoramento
- ○ Outro [ ]

**6 Indique a sua situação profissional ***

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Desempregado(a)
- ○ Trabalhador por conta de outrem
- ○ Trabalhador por conta de própria
- ○ Reformado(a) ou pré-reformado(a)
- ○ Estudante
- ○ Outra Situação. Por favor especifique: [ ]

**7 Por favor indique o nome da instituição em que estuda. ***

**Responda a esta pergunta apenas se as seguintes condições são verdadeiras:**
° ((B1_Profissao.NAOK == "5"))

Por favor, escreva aqui a sua resposta:

[ ]

**8 Por favor indique o nome e ciclo do curso que frequenta. ***

**Responda a esta pergunta apenas se as seguintes condições são verdadeiras:**
° ((B1_Profissao.NAOK == "5"))

Por favor, escreva aqui a sua resposta:

[ ]

Exemplo: 1° ciclo em design de moda

**9 Já fez compras de vestuário *on-line*? ***

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Sim
- ○ Não
- ○ Não, mas considero a possibilidade de comprar no futuro

**10 Com que frequência compra vestuário on-line? ***

**Responda a esta pergunta apenas se as seguintes condições são verdadeiras:**
° ((B1A_Comprasonline.NAOK == "1"))

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Uma vez por ano
- ○ Semestralmente
- ○ Trimestralmente
- ○ Mensalmente
- ○ Mais de uma vez por mês
- ○ Outra: [ ]

**11 Já comprou vestuário customizado on-line? ***

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Sim
- ○ Não
- ○ Não, mas considero a possibilidade de comprar no futuro

Por exemplo: t-shirts com estampagem personalizada; camisas ou fatos em que é possível selecionar tecidos, pormenores de design e confecção e/ou medidas

**12 Ficou satisfeito com o produto customizado? ***

**Responda a esta pergunta apenas se as seguintes condições são verdadeiras:**
° ((B1A.NAOK == "1"))

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Sim
- ○ Não

**13 Ficou satisfeito com a experiência *on-line*? ***

**Responda a esta pergunta apenas se as seguintes condições são verdadeiras:**
° ((B1A.NAOK == "1"))

Por favor, seleccione **apenas uma** das seguintes opções:

- ○ Sim
- ○ Não

**14 Por favor classifique o seu nível de concordância (ou discordância) com as seguintes afirmações: ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Discordo totalmente | Discordo | Indiferente | Concordo | Concordo totalmente |
|---|---|---|---|---|---|
| Tenho um grande interesse em vestuário | ○ | ○ | ○ | ○ | ○ |
| O vestuário é muito importante para mim | ○ | ○ | ○ | ○ | ○ |
| Eu estou muito envolvido (a) com o vestuário | ○ | ○ | ○ | ○ | ○ |
| Considero o vestuário como uma parte central da minha vida | ○ | ○ | ○ | ○ | ○ |
| Sou um utilizador(a) de vestuário experiente | ○ | ○ | ○ | ○ | ○ |

**15 Por favor classifique o seu nível de concordância (ou discordância) com as seguintes afirmações: ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Discordo totalmente | Discordo | Indiferente | Concordo | Concordo totalmente |
|---|---|---|---|---|---|
| À medida que as pessoas me conhecem apercebem-se das minhas características especiais | ○ | ○ | ○ | ○ | ○ |
| Sinto-me único (a) | ○ | ○ | ○ | ○ | ○ |
| Não consigo pensar em muitas características especiais que me distingam dos outros | ○ | ○ | ○ | ○ | ○ |
| Penso que as características que me definem são diferentes dos outros | ○ | ○ | ○ | ○ | ○ |
| Sinto que algumas das minhas características são unicamente minhas | ○ | ○ | ○ | ○ | ○ |

**16 Por favor classifique o seu nível de concordância (ou discordância) com as seguintes afirmações: ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Discordo totalmente | Discordo | Não concordo nem discordo | Concordo | Concordo totalmente |
|---|---|---|---|---|---|
| Sou muito atraído (a) por vestuário fora do vulgar | ○ | ○ | ○ | ○ | ○ |
| Como consumidor costumo ser mais um(a) líder de moda, do que um(a) seguidor(a) de moda | ○ | ○ | ○ | ○ | ○ |
| Tendo mais tendência a comprar vestuário se for de edição limitada | ○ | ○ | ○ | ○ | ○ |
| Preferiria ter vestuário feito à medida do que confecionado em série | ○ | ○ | ○ | ○ | ○ |
| Gosto de ter vestuário que os outros não têm | ○ | ○ | ○ | ○ | ○ |
| Raramente deixo passar a oportunidade de ter características personalizadas no vestuário que compro | ○ | ○ | ○ | ○ | ○ |
| Gosto de experimentar vestuário novo antes dos outros | ○ | ○ | ○ | ○ | ○ |
| Gosto de comprar em lojas que têm vestuário diferente e pouco comum | ○ | ○ | ○ | ○ | ○ |

**17 Por favor classifique o seu nível de concordância (ou discordância) com as seguintes afirmações: ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Discordo totalmente | Discordo | Discordo um pouco | Não concordo nem discordo | Concordo um pouco | Concordo | Concordo totalmente |
|---|---|---|---|---|---|---|---|
| Acho interessante a compra de vestuário customizado *on-line* | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Se tiver oportunidade, vou comprar vestuário customizado *on-line* num futuro próximo | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Vou tentar comprar vestuário customizado online, num futuro próximo | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Planeio comprar vestuário customizado online, num futuro próximo | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**18 Por favor indique de que forma as afirmações seguintes representam características suas ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Extremamente incaracterístico | Incaracterístico | Não tenho consciência | Característico | Extremamente característico |
|---|---|---|---|---|---|
| Aprender novas formas de pensar não me estimula muito | ○ | ○ | ○ | ○ | ○ |
| Esforço-me a pensar apenas o mínimo exigido | ○ | ○ | ○ | ○ | ○ |
| Sinto-me mais aliviado (a) do que satisfeito (a) depois de completar uma tarefa que exigiu muito esforço mental | ○ | ○ | ○ | ○ | ○ |
| Não gosto da responsabilidade de ter de lidar com uma situação que exija pensar muito | ○ | ○ | ○ | ○ | ○ |
| Pensar não é a minha ideia de divertimento | ○ | ○ | ○ | ○ | ○ |
| Prefiro fazer algo que requere pouco esforço mental do que algo que desafie as minhas capacidades cognitivas | ○ | ○ | ○ | ○ | ○ |

**19 Por favor indique de que forma as afirmações seguintes representam características suas ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Extremamente incaracterístico | Incaracterístico | Não tenho consciência | Característico | Extremamente característico |
|---|---|---|---|---|---|
| Gosto de aprender coisas novas mais que os outros | ○ | ○ | ○ | ○ | ○ |
| Gosto de trabalhar em novas ideias | ○ | ○ | ○ | ○ | ○ |
| A informação é o meu recurso mais importante | ○ | ○ | ○ | ○ | ○ |

**20 Por favor classifique o seu nível de concordância (ou discordância) com as seguintes afirmações: ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Discordo totalmente | Discordo | Discordo um pouco | Não concordo nem discordo | Concordo um pouco | Concordo | Concordo totalmente |
|---|---|---|---|---|---|---|---|
| Procuro simplificar a minha vida o mais possível | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Gosto de me vestir de forma simples | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Na escolha de vestuário prefiro ter um número limitado de opções | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sinto-me confuso(a) quando confrontado(a) com um grande número de opções de peças de vestuário | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Na escolha de vestuário prefiro geralmente combinações simples e previsíveis, do que complexas e imprevisíveis | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**21 Por favor indique de que forma as afirmações seguintes representam características suas ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Extremamente incaracterístico | Incaracterístico | Não tenho consciência | Característico | Extremamente característico |
|---|---|---|---|---|---|
| Sinto necessidade de formar opiniões sobre tudo | ○ | ○ | ○ | ○ | ○ |
| Ter opiniões firmes é muito importante para mim | ○ | ○ | ○ | ○ | ○ |
| Gosto de ter opiniões firmes mesmo não estando pessoalmente envolvido (a) | ○ | ○ | ○ | ○ | ○ |
| Tenho muito mais opiniões do que uma pessoa comum | ○ | ○ | ○ | ○ | ○ |
| Apenas formo opiniões firmes quando a isso sou obrigado | ○ | ○ | ○ | ○ | ○ |

**22 Por favor classifique o seu nível de concordância (ou discordância) com as seguintes afirmações: ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Discordo totalmente | Discordo | Discordo um pouco | Não concordo nem discordo | Concordo um pouco | Concordo | Concordo totalmente |
|---|---|---|---|---|---|---|---|
| Tenho mais confiança em vestuário que possa ser tocado antes da compra | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sinto-me mais confortável a comprar vestuário depois de o examinar fisicamente | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Se não puder tocar uma peça de vestuário na loja, fico relutante em comprá-la | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sinto-me mais confiante a comprar vestuário depois de o tocar | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| A única maneira de me certificar se vale a pena comprar uma peça de vestuário é tocar-lhe | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Há muitas peças de vestuário que só compraria se pudesse tocar-lhes antes da compra | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**23 Por favor classifique o seu nível de concordância (ou discordância) com as seguintes afirmações: ***

Por favor, seleccione uma resposta apropriada para cada item:

| | Discordo totalmente | Discordo | Discordo um pouco | Não concordo nem discordo | Concordo um pouco | Concordo | Concordo totalmente |
|---|---|---|---|---|---|---|---|
| Preciso de ter uma visão clara de como é que uma peça de vestuário virtual é na realidade | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Para mim as tecnologias de interatividade de imagem (ex: imagens em 2D e 3D, avatars, zoom) são importantes para conseguir visualizar melhor o produto real | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| É importante para mim ter uma visão clara de como uma peça de vestuário virtual assenta no meu corpo | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Concebo facilmente uma representação real de uma peça de vestuário virtual, mesmo com pouca informação | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Não me importo de fazer um esforço extra para obter uma imagem mais real de uma peça de vestuário virtual | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| O vestuário apresentado de forma virtual não é o tipo de produto que me seja fácil de visualizar como real | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

"Entenda-se por peça de vestuário virtual, uma peça que não existe fisicamente, sendo apresentada através de imagens exemplificativas ou desenhos"

**24**
*

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Sinto-me com frequência muito criativo (a) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sou capaz de encontrar novas soluções | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Imaginativo(a) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**25** *

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Ordeiro(a) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Minucioso(a) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Organizado(a) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Eficiente | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**26** *

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Envergonhado(a) na presença de outras pessoas | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tímido(a) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Calado(a) na presença de outras pessoas | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**27** *

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Amável para com os outros | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Generoso(a) para com os outros | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Compreensivo(a) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**28** *

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Mais mal-humorado(a) do que os outros | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Temperamental | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mais irritável do que os outros | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tenho variações emocionais bruscas | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**29 ***

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Gosto de comprar coisas caras | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Gosto de ter coisas luxuosas | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adquirir coisas valiosas é importante para mim | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Gosto de ter coisas boas mais do que a maioria das pessoas | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**30 ***

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Focado(a) no meu corpo e no seu estado | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Dedico tempo todos os dias a melhorar o meu corpo | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sinto que tornar o meu corpo mais atraente é importante | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Trabalho arduamente para manter o meu corpo saudável | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**31 ***

Por favor, seleccione uma resposta apropriada para cada item:

| | 1 - Nunca | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 - Sempre |
|---|---|---|---|---|---|---|---|---|---|
| Atraído(a) por experiências com elementos de perigo | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prefiro o novo e diferente ao já experimentado e conhecido | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Procuro a sensação de adrenalina | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Gosto de correr riscos mais que os outros | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

# Appendix 5 Complete descriptive analysis

Table 39 Complete Descriptive Analysis of Elemental traits

| *Construct* | *Indicator* | *Mean* | *Standard Deviation* | *Analysis N* | *Skew* | *Kurt* |
|---|---|---|---|---|---|---|
| ***Openness to experience*** [1] | | 6.525 | 1.402 | 840 | -0.528 | 0.169 |
| OPEN1 | Frequently feel highly creative | 6.108 | 1.683 | 840 | -0.290 | -0.402 |
| OPEN2 | Find novel solutions | 6.724 | 1.391 | 840 | -0.555 | 0.281 |
| OPEN3 | Imaginative | 6.744 | 1.648 | 840 | -0.650 | 0.061 |
| ***Extraversion*** | | 5.080 | 2.011 | 840 | 0.036 | -0.840 |
| EXTR1 | Bashful when with people | 5.187 | 2.188 | 840 | 0.005 | -1.029 |
| EXTR2 | Shy | 5.007 | 2.171 | 840 | 0.040 | -0.904 |
| EXTR3 | Quiet when with people | 5.048 | 2.126 | 840 | 0.127 | -0.914 |
| ***Neuroticism*** | | 4.107 | 1.812 | 840 | 0.452 | -0.421 |
| NEUR1 | Moody more than others | 3.636 | 1.986 | 840 | 0.760 | -0.132 |
| NEUR2 | Temperamental | 4.669 | 2.170 | 840 | 0.122 | -0.932 |
| NEUR3 | Testy more than others | 4.113 | 2.080 | 840 | 0.438 | -0.667 |
| NEUR4 | Emotions go way up and down | 4.012 | 2.228 | 840 | 0.490 | -0.786 |
| ***Need for material resources*** | | 3.678 | 1.948 | 840 | 0.656 | -0.392 |
| N4MR1 | Enjoy purchasing expensive things | 3.554 | 2.164 | 840 | 0.688 | -0.533 |
| N4MR2 | Enjoy owning luxurious things | 3.714 | 2.255 | 840 | 0.614 | -0.674 |
| N4MR3 | Acquiring valuable things is important to me | 3.496 | 2.191 | 840 | 0.756 | -0.355 |
| N4MR4 | Like to own nice things more than most people | 3.948 | 2.207 | 840 | 0.512 | -0.648 |
| ***Need for arousal*** | | 4.564 | 1.929 | 840 | 0.187 | 0.084 |
| N4A1 | Drawn to experiences with an element of danger | 4.087 | 2.305 | 840 | 0.369 | -0.910 |
| N4A12 | Like the new and different more than the tried and true | 5.331 | 2.067 | 840 | -0.087 | -0.778 |
| N4A13 | Seek an adrenaline rush | 4.663 | 2.258 | 840 | 0.131 | -0.983 |
| N4A14 | Enjoy taking risks more than others | 4.176 | 2.157 | 840 | 0.279 | -0.912 |

Based on a nine-point scale where respondents indicated how often they feel or act this way, 1 = never and 9 = always

Table 40 Complete Descriptive Analysis of Compound traits

| *Construct* | *Indicator* | *Mean* | *Standard Deviation* | *Analysis N* | *Skew* | Kurt |
|---|---|---|---|---|---|---|
| ***Need to evaluate*** [1] | | 3.461 | 0.649 | 840 | -0.250 | 0.097 |
| N2E1 | I form opinions about everything | 3.276 | 1.043 | 840 | -0.305 | -0.782 |
| N2E2 | It is very important to me to hold strong opinions | 3.831 | 0.844 | 840 | -0.923 | 0.961 |
| N2E3 | I like to have strong opinions even when I am not personally involved | 3.456 | 0.952 | 840 | -0.580 | -0.301 |
| N2E4 | I have many more opinions than the average person | 3.158 | 0.903 | 840 | -0.073 | 0.100 |
| N2E5 | I only form strong opinions when I have to (R) | 3.585 | 0.967 | 840 | -0.677 | -0.094 |
| ***Sense of uniqueness*** [2] | | 3.578 | 0.651 | 840 | -0.570 | 0.816 |
| SOU1 | As people get to know me more. they begin to recognize my special features | 3.794 | 0.806 | 840 | -0.745 | 0.920 |
| SOU2 | I feel unique | 3.379 | 1.032 | 840 | -0.468 | -0.327 |
| OU3 | I cannot think of many special characteristics that distinguish me from others (R) | 3.436 | 0.933 | 840 | -0.359 | -0.488 |
| SOU4 | I think that the characteristics that make me up are different from others’ | 3.561 | 0.859 | 840 | -0.517 | 0.182 |
| SOU5 | I feel that some of my characteristics are completely unique to me | 3.724 | 0.921 | 840 | -0.857 | 0.541 |
| ***Need for cognition*** [1] | | 3.906 | 0.722 | 840 | -0.504 | 0.018 |
| N4C1 | Learning new ways to think doesn't excite me very much | 4.079 | 0.992 | 840 | -1.206 | 1.048 |
| N4C2 | I only think as hard as I have to | 4.127 | 0.877 | 840 | -1.047 | 0.879 |
| N4C3 | I feel relief rather than satisfaction after completing a task that required a lot of mental effort | 3.276 | 1.239 | 840 | -0.317 | -1.074 |
| N4C4 | I don't like the responsibility of handling a situation that requires a lot of thinking | 3.964 | .954 | 840 | -0.950 | 0.440 |
| N4C5 | Thinking is not my idea of fun | 4.001 | .935 | 840 | -0.973 | 0.603 |
| N4C6 | I would rather do something that requires little thought than | 3.990 | .970 | 840 | -0.930 | 0.346 |

| *Construct* | *Indicator* | *Mean* | *Standard Deviation* | *Analysis N* | *Skew* | Kurt |
|---|---|---|---|---|---|---|
| | something that is sure to challenge my thinking abilities | | | | | |

[1] Based on a five-point scale where respondents indicated to what extent the statement is characteristic of them 1 = extremely uncharacteristic 5 = extremely characteristic

[2] Based on a five-point scale where respondents indicated to what extent agree or disagree with the statement, 1 = strongly disagree 5 = strongly agree

Table 41 Complete Descriptive Analysis of Situational traits

| *Construct* | *Indicator* | *Mean* | *Standard Deviation* | *Analysis N* | *skew* | *Kurt* |
|---|---|---|---|---|---|---|
| ***Apparel involvement*** [1] | | 3.520 | 0.821 | 840 | -0.217 | -0.295 |
| INVO1 | I have strong interest in clothes | 3.836 | 0.913 | 840 | -0.659 | 0.238 |
| INVO2 | Clothes are very important to me | 3.762 | 0.895 | 840 | -0.763 | 0.518 |
| INVO3 | I am very much involved with apparel | 3.354 | 1.031 | 840 | -0.146 | -0.639 |
| INVO4 | I consider apparel to be a central part of my life | 3.254 | 1.062 | 840 | -0.286 | -0.682 |
| INVO5 | I am an experienced user of apparel | 3.396 | 0.993 | 840 | -0.206 | -0.512 |
| ***Desire for unique products*** [1] | | 2.985 | 0.742 | 840 | -0.236 | -0.193 |
| DFUP1 | I am very attracted to rare apparel | 2.989 | 1.090 | 840 | -0.117 | -0.791 |
| DFUP2 | I tend to be a fashion leader rather than a fashion follower | 2.658 | 1.005 | 840 | 0.229 | -0.317 |
| DFUP3 | I am more likely to purchase apparel if it is scarce | 2.561 | 1.043 | 840 | 0.208 | -0.653 |
| DFUP4 | I would prefer to have apparel custom-made rather than ready-made | 3.405 | 1.031 | 840 | -0.354 | -0.340 |
| DFUP5 | I enjoy having apparel that others do not | 3.544 | 1.051 | 840 | -0.614 | -0.224 |
| DFUP6 | I rarely pass up the opportunity to order custom features on the apparel I purchase | 2.707 | 1.015 | 840 | 0.096 | -0.625 |

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|---|---|---|---|---|---|---|
| DFUP7 | I like to try new apparel before others do | 2.886 | 1.045 | 840 | 0.010 | -0.591 |
| DFUP8 | I enjoy shopping at stores that carry apparel that is different and unusual | 3.130 | 1.061 | 840 | -0.177 | -0.676 |
| ***Need for simplicity*** [2] | | 4.520 | 1.171 | 840 | -0.534 | 0.136 |
| N4S1 | I would like to simplify my life as much as I can | 5.112 | 1.497 | 840 | -0.919 | 0.233 |
| N4S2 | I like to dress in a simple way | 5.051 | 1.506 | 840 | -0.828 | -0.037 |
| N4S3 | In apparel purchase prefer have a limit number of choices | 3.738 | 1.726 | 840 | 0.050 | -1.118 |
| N4S4 | I feel confused when presented with a large number of apparel products options | 4.088 | 1.783 | 840 | -1.999 | -1.124 |
| N4S5 | When choosing apparel, I generally prefer simple or regularly predictable combinations than complex. irregular and whimsical | 4.613 | 1.631 | 840 | -0.531 | -0.611 |
| ***Need for touch*** [2] | | 5.231 | 1.195 | 840 | -0.958 | 0.931 |
| N4T1 | I place more trust in apparel that can be touched before purchase | 5.448 | 1.396 | 840 | -1.143 | 1.045 |
| N4T2 | I feel more comfortable purchasing apparel after physically examining it | 5.669 | 1.336 | 840 | -1.374 | 1.874 |
| N4T3 | If I can’t touch an apparel product in the store. I am reluctant to purchase the product | 4.945 | 1.516 | 840 | -0.705 | -0.073 |
| N4T4 | I feel more confident making a purchase after touching an apparel product | 5.443 | 1.405 | 840 | -1.155 | 1.069 |
| N4T5 | The only way to make sure an apparel product t is worth purchasing is to actually touch it | 4.506 | 1.581 | 840 | -0.342 | -0.731 |
| N4T6 | There are many apparel products that I would only purchase if I could handle them before purchase | 5.380 | 1.565 | 840 | -1.028 | 0.345 |

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|---|---|---|---|---|---|---|
| ***Need for reality*** [2] | | 5.030 | 0.767 | 840 | -0.529 | 0.790 |
| N4R1 | I need to have a clear picture of what a virtual apparel product look in reality | 5.494 | 1.241 | 840 | -0.990 | 0.978 |
| N4R2 | Image interactivity technologies (e.g. 2D and 3D images. avatars. zoom) are important to me in order to better visualize the real product | 5.607 | 1.227 | 840 | -1.113 | 1.404 |
| N4R3 | A clear vision of the final fit of an apparel product is important to me | 5.765 | 1.197 | 840 | -1.077 | 1.109 |
| N4R4 | I easily form a real representation of a virtual product even with few information (R) | 3.933 | 1.394 | 840 | -0.101 | -0.635 |
| N4R5 | I do not mind to make an extra effort to get a more real picture of the virtual product | 4.930 | 1.280 | 840 | -0.514 | -0.031 |
| N4R6 | Virtual apparel is not the sort of product easy to picture as real | 4.452 | 1.493 | 840 | -0.279 | -0.650 |

[1] Based on a five-point scale where respondents indicated to what extent agree or disagree with the statement, 1 = strongly disagree 5 = strongly agree

[2] Based on a seven-point scale where respondents indicated to what extent agree or disagree with the statement, 1 = strongly disagree 7 = strongly agree

Table 42 Complete Descriptive Analysis of Surface traits

| ***Construct*** | ***Indicator*** | ***Mean*** | ***Std. Deviation*** | ***Analysis N*** | ***Skew*** | ***Kurt*** |
|---|---|---|---|---|---|---|
| **Intention to buy apparel mass-customised products** [1] | | 4.416 | 1.251 | 840 | -0.563 | 0.294 |
| IPCA1 | I find interesting purchasing customised apparel products on-line | 4.919 | 1.358 | 840 | -0.890 | 0.788 |
| IPCA2 | If I have the chance. I will purchase customised apparel products on-line | 4.464 | 1.440 | 840 | -0.614 | 0.094 |
| IPCA3 | I will try to purchase customised apparel | 4.169 | 1.422 | 840 | -0.410 | -0.181 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | products on-line in the near future | | | | | |
| IPCA4 | I plan to purchase customised apparel products on-line in the near future | 4.111 | 1.388 | 840 | -0.416 | -0.081 |

[1] Based on a seven-point scale where respondents indicated to what extent agree or disagree with the statement, 1 = strongly disagree 7 = strongly agree

# Appendix 5 Inner model