MASTER'S DISSERTATION

INFLUENCE OF PACKAGING COLOUR ON CONSUMER BEHAVIOUR – A STUDY ON PACKAGING COLOUR ON BUYING INTENTION AND BRAND RECOGNITION IN THE PORTUGUESE CONTEXT

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ABSTRACT

Packaging is a crucial part of the marketing mix and is extremely important in drawing customers to a product. Most impulse purchases occur as a result of packaging attractiveness. Furthermore, colour is also strongly associated with brand personality, evoking emotional responses that can impact consumer behaviour regarding not only buying intention but also brand recognition.

Even though there is vast literature on the study of colours, there is not much regarding the packaging colour, thus this study aims to research the influence of packaging colour on consumer behaviour having into account different age groups and genders.

In order to conduct the study, a quantitative approach was applied, using a self-administrative online questionnaire.

The research concluded that packaging colours do influence consumer behaviour and that buying intention and brand recognition are dependent on packaging colours.

These study's main findings contribute to marketers and brands functioning in the Portuguese market and provide useful insights on selecting packaging colours in order to survive and grow in the current cutthroat industry.

Keywords: packaging colour, buying intention, brand recognition, consumer behaviour, colour psychology

RESUMO

A embalagem de um produto é uma parte crucial do marketing mix e é extremamente importante para atrair clientes para um produto A maioria das compras por impulso ocorrem como resultado da atratividade da embalagem. Além disso, a cor também está fortemente associada à personalidade da marca e pode impactar o comportamento do consumidor não apenas em relação à intenção de compra, mas também ao reconhecimento da marca.

Apesar de existir uma vasta literatura sobre o estudo das cores, não existe muito sobre a cor da embalagem, pelo que este estudo tem como objetivo investigar a influência da cor da embalagem no comportamento do consumidor tendo em conta diferentes faixas etárias e géneros.

Para a realização do estudo, foi seguida uma abordagem quantitativa, através de um questionário online. A pesquisa concluiu que as cores das embalagens influenciam o comportamento do consumidor e que a intenção de compra e o reconhecimento da marca dependem das cores das embalagens.

As principais conclusões deste estudo contribuem para os profissionais de marketing e marcas que atuam no mercado português e fornecem informações úteis sobre a escolha das cores da embalagem de um produto de modo a sobreviver e prosperar na atual indústria competitiva.

Palavras-chave: cores de embalagem, intenção de compra, reconhecimento de marca, comportamento do consumidor, psicologia das cores.

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INTRODUCTION

Packaging has received a lot of attention in the field of marketing because it serves as one of the most effective tools for spreading the brand's message while also serving as a logistical means of ensuring safe and effective delivery to the consumer (Hellström & Nilsson, 2011). According to (Rundh, 2005), product packaging can affect and influence consumer opinions, catch their attention, and stimulate their perceptions to form their purchase intention about a specific product (Atkin et al., 2006).

Packaging is a crucial part of the marketing mix and is extremely important in drawing customers to a product. It has been noted that packaging colour significantly affects consumers' purchasing decisions. Colours have the power to arouse feelings, shape moods, and deliver messages to consumers. Packaging is an essential tool in the food industry for promoting products and setting them apart from rivals (Ahmad et al., 2012).

A product's packaging can, therefore, provide an opportunity to communicate and directly influence the consumer's behaviour at the point of sale (Atkin et al., 2006). Previous studies have also suggested that most impulse purchases occur as a result of product display and that attractive packaging plays an important part in product display (Kamal & Ghani, 2010). This demonstrates that packaging is a critical component of product development that directly affects sales performance. This is especially true in the FMCG (Fast-moving consumer

goods) market, where the abundance of brands and the high level of market competition have increased the need to "stand out," and where consumer involvement in the purchase process appears to be on the lower end, leading to impulse-driven decisions (Luís, 2021).

Colour is also strongly associated with brand personality, evoking emotional responses that can impact consumer behaviour (Martinez et al., 2021). The role of colour in marketing and branding is a topic of great interest, with many studies exploring the impact of packaging colour on consumer preferences and buying behaviour (Beta, 2020; Floyd, 2011; Kauppinen-Räisänen, 2014).

Therefore, the use of packaging colours is a powerful tool in marketing that can influence consumer behaviour and purchasing decisions. Research has shown that colour is one of the most elementary techniques used in marketing, producing behavioural effects that reflect purchase attitudes (Martinez et al., 2021).

The purpose of this study is to investigate the influence of packaging colours on consumer buying behaviour in the food and beverage industry. This research aims to identify the impact of different packaging colours on consumer perception, attitudes, and purchase decisions.

This study is inspired and adapted from the study of Rathee & Rajain (2019), and is adapted and depended in order to assess packaging colour instead of colours in general.

The importance of studying this topic is the lack of concrete information about the influence of colour independent from other packaging elements in consumers decisions. Previous studies have shown that there where limitations in isolating colour as the only influential element since package design also includes the material, typeface, branding, written descriptions, and other graphic elements. (Gabbas et al., 2021)

This research is beneficial for the marketing and branding community since the capacity of colour to change consumers' intentions to buy can be useful for branding tactics everywhere, in order to improve sales and costumer´s brand recognition (Grimes & Doole, 1998).

The findings of this study will contribute to the existing body of knowledge on the influence of packaging colours on consumer behaviour. The results of this research will be useful to food and beverages companies and marketers in developing effective packaging strategies that align with consumer preferences and improve sales. The study also has implications for further research in the areas of packaging and consumer behaviour.

1. LITERATURE REVIEW

Next, a Literature Review is assembled to further contextualize this study. It starts with the “Colour Psychology” section, where the reader can understand more about the psychological aspects of colour and colour perception. The second section, "Packaging Design”, allows the reader to get more acquainted with packaging functionalities, packaging design and colour effect on packaging. Finally, the third section "Consumer Buying Intention" where knowledge about buying intention and packaging colour influence in it is presented.

1.1. COLOUR PSYCHOLOGY

Ott (1974) claimed that colour causes immediate physical reactions in the body that show up as observable behaviour. Some other theorists have given comments centred on learnt connections with colour and their potential impact on affective, cognitive, and behavioural responses.

Much of the writing on colour and psychological functioning done before the turn of the century concentrated on practical issues (e.g., Does the colour of an office wall affect employee productivity? What hues are most in style right now?), without much or any interest in or dependence on theoretical concerns (e.g., What colours improve the flavour of food?) (Elliot & Maier, 2014).

Today's intense consumer competitiveness and globalization drive the quest for innovative customer impact strategies and force companies to actively employ marketing strategies that establish brand awareness, exclusivity, and connections with consumers (Sliburyte & Skeryte, 2014). In the realm of marketing, persuasion is key, and one of the most intriguing, unproven, and contentious components of it is employing colours as psychological tools (Farabi, 2021).

Consumers are known to be influenced by a wide range of things, but aesthetics like colour tend to be the most prevalent (Rodriguez, 2022). Sight is the most powerful sense that the human species possesses, and the marketing industry not only recognises, but also makes every effort to use it (Farabi, 2021)

Colour psychology examines how people respond differently to various hues and how colour influences their perception of certain characteristics of an object (Chinoperekweyi, 2019). In this sense, in order to forge strong connections with their clients, many companies have learnt how to use colour psychology (Rodriguez, 2022) since colours can subconsciously alter an individual's attitude towards a product, which is why studying colours can be a valuable asset for brands seeking to elicit positive feelings and attitudes from consumers (Shi, 2013) By prioritizing colour, brands can establish a unique identity and differentiate themselves from competitors (Gabbas et al., 2021).

The relationship between colours and neuromarketing and how they affect consumer preferences is based on the ability of the mind to correlate colours by storing

them as memories (Changuán & Simbaña Jorge, 2022). This way, the use of colour can evoke strong emotions in people, which can differentiate products, give businesses a competitive edge, increase customer loyalty, lengthen customer stays in stores, foster positive relationships with customers, encourage impulsive purchases, and boost the number of people who plan to return to stores (Chinoperekweyi, 2019; Sliburyte & Skeryte, 2014).

People utilize their sense of sight the most frequently out of the five senses of touching, taste, smelling, hearing, and seeing and according to market studies, more than 80% of visual information is tied to colour (Mofarah et al., 2013). A product's perception, when influenced by colour, can also affect consumers´ mood or attitude towards it (Shi, 2013). In average, consumers decide whether to buy a product or not within 90 seconds (DR. SAJID REHMAN KHATTAK et al., 2021; Singh, 2006) and usually, 60% to 85% of them ultimately decide to buy a product based only on colour (Hunjet & Vuk, 2017; Rodriguez, 2022).

It is crucial to use the appropriate colours when engaging with customers. Designers should carefully select colours when introducing new products to convey to customers a certain message about the product. Furthermore, to packaging design, colour selection is crucial and must be appealing (Hunjet & Vuk, 2017) since it works as a tool to create product uniqueness (Sliburyte & Skeryte, 2014).

Colour is one of the key elements of a marketing strategy and marketing professionals are now highly familiar with the psychological significance of colours and

how they affect consumer behaviour. Through precise colour choice in communication, product design, and advertising, a message based on the right colour choice reaches "awareness" and generates the desire to buy a specific product. This results in persuasion, which ultimately results in the consumer's desired behaviour (Hunjet & Vuk, 2017).

1.1.1. Colour Perception

Our subconscious is immediately influenced by colour which either attracts or repels us. From a psychological perspective, each person is affected differently by a particular colour, leading to various emotional states, actions, and moods. Colours have a strong psychological connection that reveals a lot about people. In contrast to some colours, which are unwanted because they arouse unfavourable emotions or events, some colours are accepted and desired in various civilizations. Colours transmit a message that transcends all racial, religious, and sexual boundaries because of their underlying significance (Hunjet & Vuk, 2017).

Colour is a highly subjective experience that produces significant individual variances since it requires the subjective processing of a stimulus as part of the perceptual process (Helm & Tucker, 1962). This could be characterised as an intuitive, very subjective reaction to light entering the eye directly from self-luminous light sources or inadvertently from light reflected by lighted objects (Brainard & Maloney, 2011). Colour vision requires at least two types of photoreceptors (cones and rods)

with distinct spectral sensitivity levels. More specifically, cones are photoreceptors that can be divided into three categories: S (short) cones, which are particularly sensitive to short wavelengths, M (medium) cones, which are particularly sensitive to wavelength averages, and L (long) cones, which are sensitive to long wavelengths. Hue, saturation, and brightness are the three main characteristics that can be used to characterize each colour (Wong, 2010). Lightness is defined as the tint (darkness) or hue (clarity) of a perceived colour. Hue is the colour family or name of the colour (e.g., red, green, or purple). Hue is a measure of a colour's purity or the intensity or weakness (Jagnow, 2010). Although complex, the perceptual process affects affect, cognition, and behaviour. Yet, the opposite is also true: affective, cognitive, and behavioural states can alter how colour is perceived (Elliot & Maier, 2012).

1.1.2.Warm, Cool and Neutral Colours

According to Crowley (1993), colours with longer wavelength, such as red, orange, and yellow, are known as warm colours and colours with shorter wavelength, such as green, blue, and violet, are known as cool colours. Usually, warm colours and cool colours, which are at the opposite ends of the colour spectrum, cause different psychological and physiological effects (Bellizzi & Hite, 1992).

According to psychology, warm hues like red, which are also supposed to be distracting and stimulating, are thought to arouse emotions, whereas cold colours like

blue are thought to be associated with feelings of tranquillity, peace, relaxation, and pleasure. Similarly, red is thought to be more stimulating than blue in terms of blood pressure, skin conductance, and respiration rate (Roschk et al., 2017). Due to their associations with the cultures or beliefs of the buyer, colours frequently play a crucial role. It should be noted that the effects that are seen are not caused by the colours themselves but rather by the symbolic meanings that different cultures have given to colours (Chebat & Morrin, 2007).

White, black, and grey are regarded as neutral colours (S. Singh, 2006).

Warm Colours	Cool Colours	Neutral Colours
Red, Orange, Yellow	Blue, Green, Purple	Black, White, Gray

Table 1 - Classification of colours into warm, neutral, cool colours

Source: Author's elaboration

1.1.3.The Influence of Gender in Colour Perception

According to Hurlbert and Ling (2007) The average female preference rises steeply to a sustained peak in the reddish-purple region (warm colours) and falls rapidly in the greenish-yellow region (cool colours), whereas the male preference is shifted towards blue-green and less pronounced.

Gender disparities in colour preferences must be considered in marketing. Much research has been conducted that have discovered empirical evidence in this area, although there are considerable variances amongst them (Ellis & Ficek, 2001; Silver et al., 1988). One of the first important findings in this area was that males and females differed in their preferences for warm and cold hues, with females favouring warm hues (red, pink, yellow, etc.) while males preferred cool hues (blue, green, etc) (Helson & Lansford, 1970).

These findings lend credence to the assertion made by Hurlbert and Ling (2007) that there is a universal gender difference, with women consistently favouring redder hues than the backdrop.

1.1.4.The Influence of Age in Colour Perception

Regarding the connection between colour and age, contextual elements have a considerable impact on the choices made by older consumers (Yoon et al., 2009). Much research in this area have demonstrated that as people age, their preferences for colours alter (Dittmar, 2001; Gaines & Little, 1975).

According to research, elderly people prefer different colours than younger people. In the older and younger groups, respectively, chroma and brightness characteristics were the factors that determined colour preference. Given the variation in colour preferences throughout life, marketing efforts in this subject should be aimed at a specific age group (Jaint et al., 2010).

Additionally, prior studies have demonstrated that as people age, their preferences for colours change. As shown by using the colour stimuli method (Garth & Porter, 1934) and the colour name method (D'Hondt & Vandewiele, 1983), children preferred red as opposed to adults. Red was the preferred colour in studies on the developmental aspects of colour preferences based on colour stimuli in children under the age of six (Choungourian, 1968), whereas blue overtook red and green as the preferred colour in school-age children. Similar to this, studies on the names of colours revealed that kids preferred red over blue, but that preference changed as they got older and shifted more in favour of blue (D'Hondt & Vandewiele, 1983). It is unclear if colour preferences change further as adults, specifically as they age from young adults to senior citizens. Age-related changes in adult colour preferences have received less focus in this context.

On the differences in colour preferences between younger and older adults, there is a lack of comparative research (Silver & Ferrante, 1995).

According to Dittmar (2001), there are significant changes in colour preferences during adult life, the preference for blue steadily declined from age 19 to age 90. Furthermore, in both genders there is a slight rise in preference for green over red as people get older. The shift in colour preferences in adulthood appears to be the opposite of the pattern seen in childhood and adolescence, where blue gained popularity over red and green with age (D'Hondt & Vandewiele, 1983).

1.2. PACKAGING DESIGN

According to Luchs et al. (2010) the quality of a product and a consumer's propensity to buy it can both be directly influenced by packaging design, for that reason, in order to appeal to the target market, packaging design should be in line with the intended use of the product and express the intended brand image.

A package is made up of several elements that work together to persuade customers to purchase a product (Bahrainizad & Rajabi, 2018). According to Rundh (2016), these elements are divided into functional and non-functional. Within the functional elements of packaging are easy to open (Eldesouky et al., 2015), convenient to store (Eldesouky et al., 2015), easy to prepare (Jinkarn & Suwannaporn, 2015), easy to consume (Jinkarn & Suwannaporn, 2015), easy to carry (Eldesouky et al., 2015). Other five elements fit into the non-functional elements of packaging, visibility (Rundh, 2016), colour (Spence, 2016), graphics/images (Farooq et al., 2015), logotype (Lo et al., 2017) and design (Farooq et al., 2015). Packaging has received a lot of attention in the field of marketing since it serves as one of the most effective instruments for spreading the brand's message while also serving as a logistical method of assuring safe and effective delivery to the consumer (Hellström & Nilsson, 2011).

One of the key components that will distinguish some products from other items on the shelf and from those of rival businesses is colour. Any product's packaging should reflect the brand's intended subliminal message to draw in the target market and influence them to choose the product (Lal & Jacob, 2014).

In multi-sensory packaging design and branding, colour is a crucial component since the primary method of communicating information or meaning about a product in many product categories is through its package colour (Spence & Velasco, 2019).

1.2.1.Packaging Colour and Marketing

The colour of the packaging is one of the most important ways to communicate with customers. According to Funk and Oly Ndubisi (2006), colours can pique a customer's interest in a product and encourage them to buy it.

According to Singh (2006), between sixty and ninety percent of costumers' evaluation of products is based solely on colour, therefore, the right use of colour can help to distinguish a product and influence consumer perception (S. Singh, 2006), since customers may be put off by packaging colours and may even reject it (Prinsloo et al., 2012). Therefore, if packaging colours are not chosen carefully, it could result in a strategic failure (Aslam, 2006).

One of the key components that will distinguish some products from others on the shelf and from those of rival businesses is colour. Any product's packaging should reflect the brand's intended subliminal message to draw in the target market and influence them to choose the product (Lal & Jacob, 2014), since colours used in the packaging, or the atmosphere of the store are the only factors that affect mood and emotion changes.

Poorly chosen packaging colours can result in strategic failure (Aslam, 2006), therefore, understanding customer interpretation can help marketers create more effective marketing plans that will improve brand identification and raise perceived brand value (Kauppinen-Räisänen & Jauffret, 2018).

Package designers have utilised colour to sway consumer perceptions of package weight and convey psychological meaning (Bellizzi & Hite, 1992) since appealing items are more likely to capture and hold consumers' attention, which is a necessary step before they interact with other packaging components and, ultimately, make a purchase (Stoll et al., 2008).

1.2.2.Packaging Colour and Brand Recognition

As it serves as a silent salesman on the shelf in highly competitive markets, packaging is becoming more and more important (Silayoi & Speece, 2004). 73% of purchases are allegedly made at the same location as the actual transaction by customers (Rettie & Brewer, 2000). It is also claimed that in-store stimuli, such as packaging, might raise the likelihood of an unplanned purchase by up to 93% (Inman et al., 2009). Because of how these factors interact with customers as they assess products in stores, there is now a better understanding of the visual components of packaging (Morgan, 1997). To put it another way, packaging design has grown to be essential in communicating products and brands at the stage of sale (Pantin-Sohier, 2009). As a result, packaging is no longer

just a way to keep a product safe as it is also a sales strategy that encourages customer brand choice (Calver, 2004).

For a long time, brands have been used to set distinct products apart from one another (Room, 1998). According to Armstrong and Kotler (2015) a name, term, sign, symbol, design, or combination of these that identifies the producer or provider of a good or service is known as a brand. Also, a brand may refer to a business as a whole or to specific products and services offered by the business, according to Best (2010). Any product, service, or organisation can be branded, and a brand consists of both visible and invisible components and companies invest substantially in the visual components of brands, such as logos, symbols, packaging, and the environment in which the brands exist, in order to get a greater competitive edge in the current market (Lightfoot & Gerstman, 1998).

Recognizing the significance of visual elements at the point of purchase, such as colour, shape, size, or material (Bloch et al., 2003; Schmitt & Simonson, 1997), is important, but it's equally important to understand how they affect consumers' decisions (Kauppinen-Räisänen, 2014). According to some estimates, 80% of our brain is devoted to processing visual information (Lightfoot & Gerstman, 1998). It is argued that colour has a strong influence on consumers' propensity to buy a product (Ares & Deliza, 2010; Priluck Grossman & Wisenblit, 1999). Colour is one of the most effective visual cues in packaging and branding, nevertheless, since it significantly influences customers' attention and brand communication (Kauppinen-Räisänen, 2014; Schmitt & Simonson, 1997).

Kauppinen-Räisänen (2014) proposed that consumers' attention can be attracted to packaging colour either consciously or involuntarily. When customers see colours, they are familiar with, their attention is voluntarily tied to their memories. In these circumstances, customers utilise colours to look for and recognise companies based on the colours they have stored in their memories. Tavassoli (2001) discovered that colour had a significant effect on brand name memory in a study on colour and memory.

According to Macklin (1996), colour can improve children's recall of brand names. The extent of colour memory for known things is important, according to a Kimura et al. (2013). On the other hand, the surprise effect of seeing a new or unexpected colour can cause involuntary attention to be drawn (Kauppinen-Räisänen & Luomala, 2010). According to Ludden et al. (2008), setting a product apart from competitors has the advantage of piquing consumers' interest by upsetting their expectations based on past experiences, so colour in packaging and branding works as a potent visual cue for grabbing attention that may influence consumers' choices.

Regarding some real examples of brands and colour association, Pepsi claims that blue is the colour most associated with their brand, whereas red is the colour most associated with Coca-Cola. Based on these colour associations, a distinction between the two brands has been created for customers (Abril et al., 2009). Mcdonald´s is also a highly recognized brand worldwide based solely on its colours red and yellow (Shi, 2013).

Therefore, the colour associated with a brand functions as a means of recognition and reinforces the brand's identity (Abril et al., 2009).

1.3. CONSUMER BEHAVIOUR

In recent years, research into consumer behaviour and how their decision-making process has evolved and grown in importance within the marketing community. The consumer behaviour has always been a hot marketing topic, since knowing how and why consumers act in a certain way making their buying decisions helps companies improve their marketing strategies and be more successful on the market (Stankevich, 2017).

1.3.1. Buying Intention

Purchase intentions are described by (Spears & Singh, 2004) as a consumer's conscious plan or intention to make an effort to buy a product. Purchase intentions are defined as "a consumers' willingness to buy a given product at a specific time or in a specific situation" by (Lu et al., 2014). As a result, the idea of a purchase intention only refers to the desire or aim to acquire a specific good and does not necessarily imply that a consumer will always carry out that desire, as this action depends on numerous factors that affect one's ability to make purchases. The longer a consumer intends to buy a particular good or service, the higher their purchase intention will be (Boon Liat & Shi Wuan, 2014), and high purchase intentions typically result in actual purchasing behaviours (Keller, 2001). According to (Chi et al., 2013) consumer purchase intentions are influenced by how they perceive the advantages and value of a product, and this

variable is a key predictor of consumer purchasing behaviour. Fern et al. (2015) mention the significance of consumers' purchase intentions and how they are crucial for a business to have a competitive edge in the market.

By understanding consumers' purchasing patterns, we can better understand how to encourage these behaviours, which will increase the likelihood that a product will succeed. Regarding this issue, Keller (2012) argues that a consumer's recognition of the product, behaviour, and disposition all have an impact on their purchase intention. In addition, Khan and Ahmad (2018) contend that a variety of elements, including brand image, peer experience, and packaging, can influence consumers' purchase intentions.

1.3.2.Packaging Design Influence on Consumers

The significance of package design and how it affects consumers' decision-making processes was emphasised by Murphy (1997). When consumers shop for convenience-packaged goods, they go through a two-step decision-making process, according to him. The decision to further examine the product must first be made by the customer when they first see it on the supermarket shelf. When deciding whether to examine a product, the package design is a major factor. Second, because packaging is the "silent salesman," it continues to promote choice and increases purchase intention after the consumer examines the product more closely by handling it (Murphy, 1997).

1.3.3.Packaging Colour Influence on Consumers

Colour is one of the most crucial packaging elements in terms of attentional capture and appeal among the various visual aspects of packaging that consumers can choose from, according to Spence and Velasco (2019) and Ehsan and Samreenlodhi, 2015). According to Priluck Grossman and Wisenblit (1999), consumers acquire colour associations through experience, which causes them to favour particular colours for particular product categories or even link particular colours to specific brands, explaining why some of the most well-known brands in the world have become associated with particular colours due to their prominent use in branding and packaging, such as Coca-Cola's use of red and Starbucks' use of green.

S. Singh (2006) discussed how customers evaluate products and found that between 60 and 90 percent of that evaluation is solely based on colour. According to Aslam (2006), colour is a key component of goods, services, packages, logos, displays, and collateral that affects perceptions. In addition to influencing brand perceptions (Labrecque & Milne, 2012), colours may also influence customers' responses and purchasing decisions, which are unrelated to brand preferences (Clement, 2007).

Prinsloo, Van der Merwe, et al. (2012) found that customers may be put off by the colours on packaging, leading to strategic failure if the colours are not picked carefully (Aslam, 2006). Colours can be strategically used to affect a brand's personality and buying intentions, as demonstrated by Labrecque and Milne (2012). Despite the fact that colours have an impact on people's personalities, traditional psychologists

frequently ignore them; however, psychiatrists use colour tests in conjunction with other personality assessments Singh (2006). According to Bellizzi and Hite (1992), packagers have used colours to sway consumers' perceptions of package weight and to convey psychological meaning, thus, it can be argued that packaging colour significantly influences potential customers' shopping preferences and purchasing intentions.

Colours and consumer behaviour are profoundly correlated. Packaging and colour of a product have a direct and immediate effect on the minds of consumers. Therefore, it is crucial to conduct research on this subject to determine which colours have the greatest positive and negative effects on consumer choice and, ultimately, purchasing behaviour (Babolhavaeji et al., 2015). The study by Brody et al. (1981) found that television advertisements have a significant influence on kids' consumer behaviour. Children are therefore unaware of a product's important components or quality. Only the product's colours capture their attention. Therefore, a good colour scheme in an advertisement will draw lots of children, who will then become customers for the business. Good commercials grab kids' attention and encourage parents to buy the product as a result (Brody et al., 1981).

It is undeniable that colour can help draw customers' attention because, by nature, humans are quick to notice items that are colourful and because, generally speaking, colour tends to catch people's attention more than monochrome. Because of how our brain's pre-attentive system was created and evolved, it is simple to detect colour in the environment. More importantly, this system performs the immediate task of choosing objects for later attentional processing. However, in the real world, colour never stays

alone and can only be perceived in a symphony with other adjacent colours. As a result, using colour to draw customers' attention can be challenging because it heavily depends on the environment in which the item with the target colour(s) is placed, and different colours do indeed have different attention values (Jansson-Boyd, 2010; Evans et al., 2006).

1.3.4.Packaging Colour Influence on Brand Recognition

The ability of the consumer to recognise or associate a product with a brand is known as brand acknowledgment. Marketers create brand recognition by using a specific combination of colours and shapes to create a brand stamp. The key is consistency; a company must use the same colours in all of its endeavours. Researchers at College of University discovered that colour increases brand recognition by up to 80%. In another study, when a group of people were Green and they saw 3-second advertisements, more than 62% of them formed an association with a brand based only on the colours they saw (Beta, 2020).

Brand recognition has a significant impact on consumer purchasing behaviour. Along with drive customers, many other consumers seek out products from well-known brands. Customers are given the ability to quickly and easily identify the brand they are looking for among a sea of comparable goods thanks to successful colour control (Beta, 2020).

Once a business is successful in establishing brand recognition, it can incidentally control trademark colours to add interest to a product. For example, Heinz introduced EZ Squirt Blastingin' Green ketchup in October 2000, successfully establishing brand recognition by using the colour ruddy. The emotional switch from the recognisable ketchup bottles in deep red increased item sales by $23 million. Customers had established such strong associations between Heinz and red ketchup bottles that the green bottles drew interest and attention. This gives a good explanation of the power of colour (Beta, 2020).

2. CONCEPTUAL MODEL

In order to frame the research, a Conceptual model was created. (Figure 1). A conceptual model is a framework that represents the complexity of the interactions that are established between the components that make up the solution to the problem by logically organizing and integrating the many concepts and processes under examination (Oliveira & Ferreira, 2014).

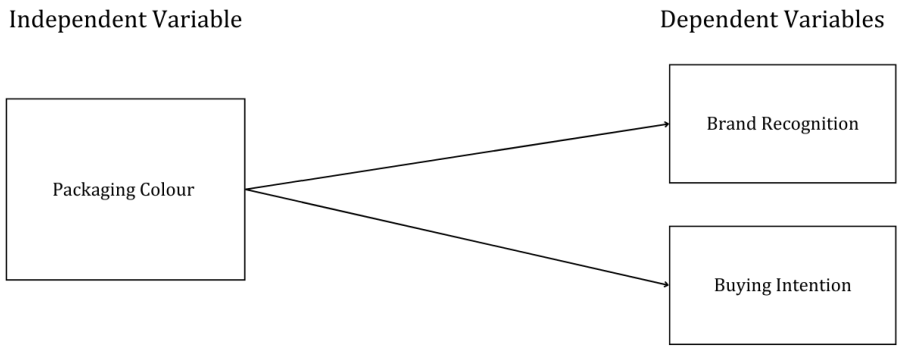


Figure 1- Conceptual model

Source: Author´s elaboration

This model presents the research's hypotheses represented by each arrow connecting the independent variable and the dependent variables. These Hypothesis were adapted from Rathee and Rajain (2019).

H1: There is significant difference between the colour preferences based on gender of the respondents.

H2: Colour positively influences consumer's buying intention.

H3: Colours positively impact brand recognition.

H4a: There is a significant difference in customer's buying intention for product with warm colours and cool colours.

H4b: There is a significant difference in customer's buying intention for product with warm colours and neutral colours.

H4c: There is a significant difference in customer's buying intention for product with neutral colours and cool colours.

H5: packaging colour positively impacts brand recognition.

3.METHODOLOGY

This section of the study focuses on explaining the goal of the investigation, the primary research philosophy that directs it, and the complete process and procedures presumed to achieve the study's objectives. To address the research objectives and test the research hypotheses, this chapter describes the technique utilised to carry out the empirical research. The chapter begins by explaining the research design and justification for the chosen method. It then details the sampling strategy, data collection procedures, and data analysis methods, with a specific focus on the quantitative methods used.

3.1.RESEARCH PHILOSOPHY

According to Saunders et al. (2019) research philosophy describes a set of presumptions and attitudes towards the creation of knowledge. In other words, a research philosophy intends to explain key assumptions that will eventually be used to construct a research plan. These assumptions inevitably shape the understanding of the research questions, the methods used and how the researcher interprets the findings (Crotty, 1998). To reflect how a researcher sees the world, knowledge creation, and its source, one attempts to define a research philosophy (Saunders et al., 2019).

The process of discovering and comprehending the research philosophy requires the researcher to sharpen the talent of reflexivity, as to question personal thoughts and behaviours and to analyse personal ideas with the same rigour others' beliefs should be analysed (Haynes, 2012).

Positivism is a natural scientist's philosophical perspective that calls for using observed social reality to generate generalizations that resemble laws. Originating in the writings of Auguste Comte, Francis Bacon, and the Vienna Circle of early 20th-century philosophers and scientists, it offers unambiguous and accurate knowledge. Positivists adhere to a stringent empiricist scientific process intended to produce objective data and facts unaffected by human interpretation or bias (Saunders et al., 2019).

This research is based on positivism since the hypothesis are being developed from existing previous theories (Saunders et al., 2019).

This study aims, as stated previously, to comprehend how packaging colour affects consumers. The association between consumer perceptions of packaging colour and brand recognition as well as buying intention will also be explored.

3.2. RESEARCH OBJECTIVES

General Objective:

To understand packaging colour influence on consumer behaviour and brand recognition.

Specific Objectives:

1. To identify the preferred colour based on the package design.

2. To assess colour preference based on gender.

3. To assess colour preference based on age.

4. To acknowledge the influence of packing colour (warm, neutral and cool) on consumer´s buying intention.

5. To understand the influence of packaging colour in consumer´s ability to recognize brands.

3.3. RESEARCH DESIGN

Quantitative research designs are typically connected with positivism, particularly when paired with highly controlled and predefined data collection methods. However, it is widely regarded as a philosophical caricature to assert that positivism, deduction, and a quantitative research methodology are inextricably linked (Bryman, 1990).

According to (Creswell, 2014), the quantitative method is a statistical method that allows for the creation of new meaning and understanding. New knowledge will be created in this investigation's focus on consumer behaviour, specifically in the understanding of the behaviour of digital immigrants towards online consumption alternatives and the creation of this consumer's profile. This methodology generates and uses mostly numerical data, allowing for the preservation of objectivity, validity, and reliability of the depiction of the studied reality and the confirmation or rejection of each proposed hypothesis (Saunders et al., 2019).

Quantitative research is typically connected with a deductive methodology in which data are gathered and evaluated to test hypotheses (Saunders et al., 2019). Since this study is following and testing hypothesis, it complies with deductive methodology, therefore, quantitative research approach is the most adequate to follow.

To conclude, this research will be conducted following a quantitative method and the technique used to follow this method is going to be a self-administered questionnaire.

3.3.1.Sampling Technique

Sampling is related with the selection of a subset of individuals from within a population to estimate the characteristics of whole population (A. S. Singh & Masuku, 2014).

The sampling technique used in this study is probability simple random sampling, whereby participants are selected by chance, and everyone has the same probability of being selected the sample is selected by a random procedure (Bryman & Bell, 2011; Malhotra et al., 2017).

Respondents should be consumers who have purchased products from the beverage category as well as to be Portuguese.

The ratio for responses is expected to be around 8 to10 respondents for 1 scale (10:1/8:1), for a questionnaire with 19 questions the expected sample is between 152 and 190 respondents.

The questionnaire was shared through social media platforms, including Facebook groups and Instagram between the dates of April 15th and May 10th. Responses from 177 participants were collected and analysed.

3.4. Data Collection Process

3.4.1. Data Collection Technique

The data collection method used in this study was an online self-administered questionnaire, where the participants respond to questions by completing the form on their own (Bryman & Bell, 2011).

The questionnaire consisted of two parts. The first part being about demographic information as gender, age, and occupation (Rathee & Rajain, 2019). The second part, first section accessing preferred colour. The second section regrading colour preference, touching on warm, cool, and neutral colours. The third one concerning brand recognition and finally the last one regarding buying intention. On the second part, on the first section, an image showing nine coloured beverage bottles (three in neutral colours, three in warm colours and three in cool colours) will be used for an open-ended question regarding the respondent's preferred colour. The fact that the questionnaire addressed various topics made it vital for it to be divided into sections, with a total of two parts and five sections that ensured the distinction between the variables and the reader's ease of reading. Since this was a self-administrative questionnaire, most of the questions were closed, which made the response procedure simpler and quicker. Furthermore, it should be emphasised that besides the section of demographics, one question in part two was an open question and on the rest of the sections a 5-point Linkert scale was used.

The questionnaire was developed in English and created using the Google Forms platform. Furthermore, the questionnaire was shared between the 15th of April and the 10th of May of 2023 through Facebook groups and Instagram.

An image (figure 2) is presented on the second part of the questionnaire, in order to illustrate packaging in three colours of the three colour groups (warm, cool, neutral).

Figure 2 - Illustrative image of bottles in neutral, warm, and cool colors

Source: Author´s elaboration

3.4.1.1. Pretest

A pretest of the survey was conducted since some of the scales from Rathee and Rajain (2019) were adapted. Furthermore, the pretest was also conducted to refine the questionnaire's design and discover any mistakes that may only be obvious to the target population (Reynolds et al., 1993).

The pretest was shared and responded by thirty people, one of them being an academic professor. After the thirty responses were gathered, a Cronbach's alpha test was made on SPSS to check the reliability of the adapted scales. Based on the feedback from the respondents, alterations as grammar and spelling mistakes, were made to the questionnaire.

3.4.2.Data Collection Instruments

The scales used for the study were adapted from Rathee and Rajain (2019) in order to better respond to the research objectives.

In the study conducted by Rathee and Rajain (2019), the aim of the study was to assess the role colour plays in influencing consumer behaviour. Since the present study assesses the packaging colour instead of colour in general, some of the scales were adapted in order to fit the dimension of packaging colours.

These adaptations not only help to respond to the objectives as well as bring new knowledge to the packaging colour dimension. The selected product category was

beverages, since specially in the FMCG market, packaging is a crucial component of product development that directly affects sales performance. In this market segment, the abundance of brands available and the high level of market competition have increased the need to stand out, and consumer purchase involvement appears to be on the lower end, leading to impulse-driven decisions (Luís, 2021).

The first section (Demographic) was measured using a scale for age, female and male option for gender and open question for occupation. The second section (Preferred Colour) was an open question answered with the aid of the illustration (figure 2). The three last sections were measured using a 5-point likert scale ranging from highly disagree to highly agree.

Demographic	Age	(Rathee & Rajain, 2019)
	Gender	
	Occupation	
Preferred Colour	What is your preferred colour?	

Colour Preference	Colour can improve comprehension	
	Colour tends to make marketing materials (ads, promotions etc.) more readable than black and white	
	Colour helps to remember more easily for longer time	
	A colour of a product provides pleasure to me	
	I relish seeing displays of products that are colourful	
	Sometimes the colour of a product seems to reach out and seize me	
	When I see a product with cool colours (blue, green, purple), I have a feeling of calmness and relaxation	
	Presence of colours like red, yellow, orange creates an environment of warmth and energy	
	Products with cool colours (like blue, green or purple) capture more my attention	
	Colour of a product seeks my attention	

Buying Intention	Colour is prime reason to buy a particular product	
	When the colour of a product appeals, I feel a strong urge to purchase it	
	When I see a new product with striking colours, I usually buy it	
Brand Recognition	Colour can increase ability to recognize brands	
	Being able to differentiate between product/brand colours reduces search time	
	Colour is a good way to distinguish one brand from another	
	When I see a new or different colour brand, I often pick it up to see what it is like	
	While buying an unfamiliar brand its colour helps me in making the decision	

Table 2 - Scales

Source: Adapted from (Rathee & Rajain, 2019)

3.5. DATA ANALYSIS

After collection the data through the self-administrative questionnaire on google forms, the data was transferred to an excel document and later to SPSS where it was organized and prepared. Data analysis was conducted using SPSS version 27.0.

Descriptive statistics were used to summarize the demographic characteristics of the sample. Furthermore, descriptive statistics as well as Cronbach's alpha were also used to access reliability of the constructs (questions of the questionnaire).

Regarding the question about preferred colour descriptive statistics was also used. Furthermore, for gender and preferred colour chi-square test was conducted. The chi-squared test evaluates the claim that two categorical variables do not have any relationship with one another. It contrasts the observed frequencies from the data with the frequencies that would be anticipated if the two variables had no relationship (Field, 2018).

Pearson´s correlation test was used in order to confirm if there was a relationship between brand recognition, buying intention, and packaging colour. Pearson correlation is a measure of the linear relationship between two quantitative variables (Field, 2018).

To access a relationship between packaging colour and buying intention as well as between packaging colour and brand recognition regression analysis was conducted.

For buying intention questions, regarding the three colour groups (warm, cool, and neutral), A-NOVA test and Multiple Comparisons were applied. The ANOVA test is employed to evaluate whether there are any statistically significant differences between the means of two or more independent (unrelated) groups (Field, 2018).

4.RESULTS AND FINDINGS

Before conducting the tests on SPSS some assumptions need to be tested in order to ensure validity and reliability of the results (Verma & G. Abdel-Salam, 2019).

It's critical to evaluate the assumptions for the ANOVA test in SPSS, including normality, homogeneity of variance, independence, and interval or ratio scale. Examining these presumptions contributes to ensuring the accuracy and dependability of the ANOVA results.

For the normality assumption, One-Sample Kolmogorov-Smirnov Test was conducted and according to the results, the findings have statistical backing and can be used to conduct the tests and assess the hypothesis.

For the homogeneity of variance assumption, scatterplot graphs were created and upon interpreting the graphs it could be concluded that the assumption of homogeneity of variance was supported.

For the independence assumption, crosstabulation was applied in order to evaluate the chi-square, and according to the results strong evidence for an association or dependency between the variables under study can be found in the data.

Finally, for the interval or ratio scale assumption, descriptive statistics were applied, testing Skewness and Kurtosis. After analysing the results, and since the values of

Skewness and Kurtosis were close to zero it could be concluded that the assumption of interval or ratio scale assumption was supported.

In addition, assumptions were also tested for the Pearson's correlation test in SPSS. These assumptions include linear relationship, bivariate normality, homoscedasticity, linearity of residuals and independence. By testing these assumptions, the accuracy of the Pearson's Correlation results can be guaranteed.

Linear relationship assumption was evaluated through a scatterplot, and it was validated.

For the bivariate normality assumption, a normality test was conducted on SPSS, upon analysis of the test results normality was validates.

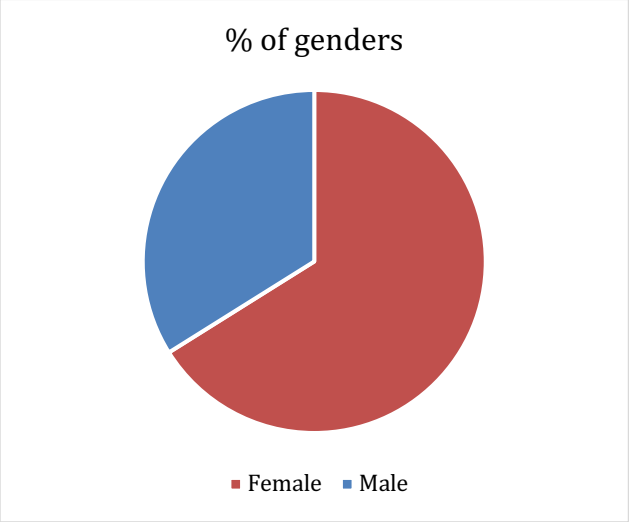
To assess the homoscedasticity a scatterplot graph was created and after analysing it the assumption of homoscedasticity was validated.

Regarding the assumption of linearity of residuals, a scatterplot graph was created and upon analysis the assumption was validated.

Finally, after assessing the research design, the sampling method, and the data collection process the assumption of independence was validated.

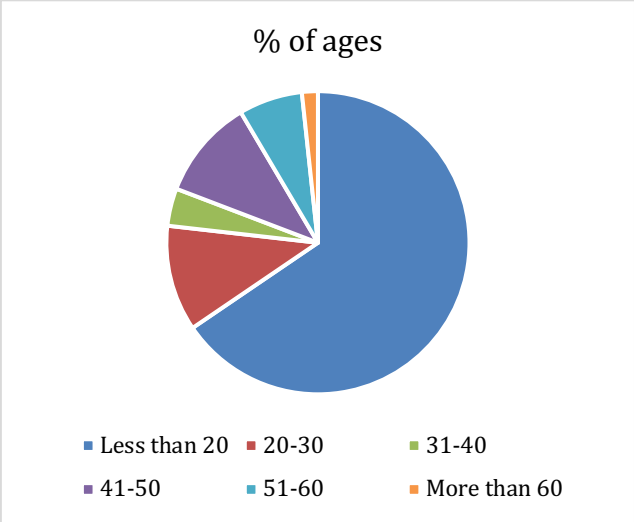
Analysis of Demographic Data

The analysed data of demographic questions showed that from the 177 respondents, 117 (66,1%) were females, 60 (33,9%) were males and majority (65,5%) belonged to the age group of 20 to 30 years old.



Graph 2 - Percentage of respondents based on gender.

Source: SPSS (author´s elaboration)



Graph 1 - Percentage of respondents based on age.

Source: SPSS (author´s elaboration)

Descriptive statistics and Cronbach's alpha

Constructs	**Mean**	**St. Deviation**	**Cronbach´s Alpha**
Packaging Colour Preference			
Colour can improve comprehension	4,38	0,752	0,812
Colour tends to make marketing materials (ads,promotions,etc.) more readable than black and white	4,10	0,987	
Colour helps to remember more easily for longer time	4,38	0,753	
A colour of a product provides pleasure to me	4,12	0,854	
I relish seeing displays of products that are colourful	3,82	0,891	
Sometimes the colour of a product seems to reach out and seize me	3,94	0,847	
When I see a product with cool colours (blue, green, purple) I have a feeling of calmness and relaxation	3,57	0,981	
Presence of colours like red, yellow, orange provides a sense of warmth and energy	3,98	0,929	
Products with cool colours (like blue, green or purple) capture more my attention	3,38	1,123	

Colour of a product seeks my attention	4,16	0,806	
Buying Intention			
Colour is prime reason to buy a particular product	2,53	1,158	0,799
When the colour of a product appeals I feel a strong urge to purchase it	3,05	1,112	
When I see a new product with striking colours I usually buy it	2,44	1,075	
Brand Recognition			
Colour can increase ability to recognize brands	4,54	0,746	0,752
Being able to differentiate between product/brand colours	4,12	0,870	
Colour is a good way to distinguish one brand from another	4,29	0,849	
When I see a new or different colour brand I often pick it	3,41	1,068	
While buying an unfamiliar brand its colour helps me in making the decision	3,05	1,154	

Table 3 - Descriptive statistics and Cronbach´s alpha

Source: SPSS (author´s elaboration)

Cronbach´s alpha test showed high values of 0.812, 0.799 and 0.752, since these values are all higher than 0,7 it proves reliability (Bujang et al., 2018).

Each construct was measured using a 5-point Likert scale, 1 representing highly disagree and 5 representing highly agree.

As it can be observed on table 3 regarding the Colour preference section of the questionnaire, for the question "Colour can improve comprehension" the average answer was 4,38; for the question "Colour tends to make marketing materials (ads,promotions,etc.) more readable than black and white" the average answer was 4,10; for the question "Colour helps to remember more easily for longer time" the average answer was 4,38; for the question "A colour of a product provides pleasure to me" the average answer was 4,12; for the question "I relish seeing displays of products that are colourful" the average answer was 3,82; for the question "Sometimes the colour of a product seems to reach out and seize me" the average answer was 3,94; for the question "When I see a product with cool colours (blue, green, purple) I have a feeling of calmness and relaxation" the average answer was 3,57; for the question "Presence of colours like red, yellow, orange provides a sense of warmth and energy" the average answer was 3,98; the question "Products with cool colours (like blue, green or purple) capture more my attention" the average answer was 3,38; and finally for the question "Colour of a product seeks my attention" the average answer was 4,16.

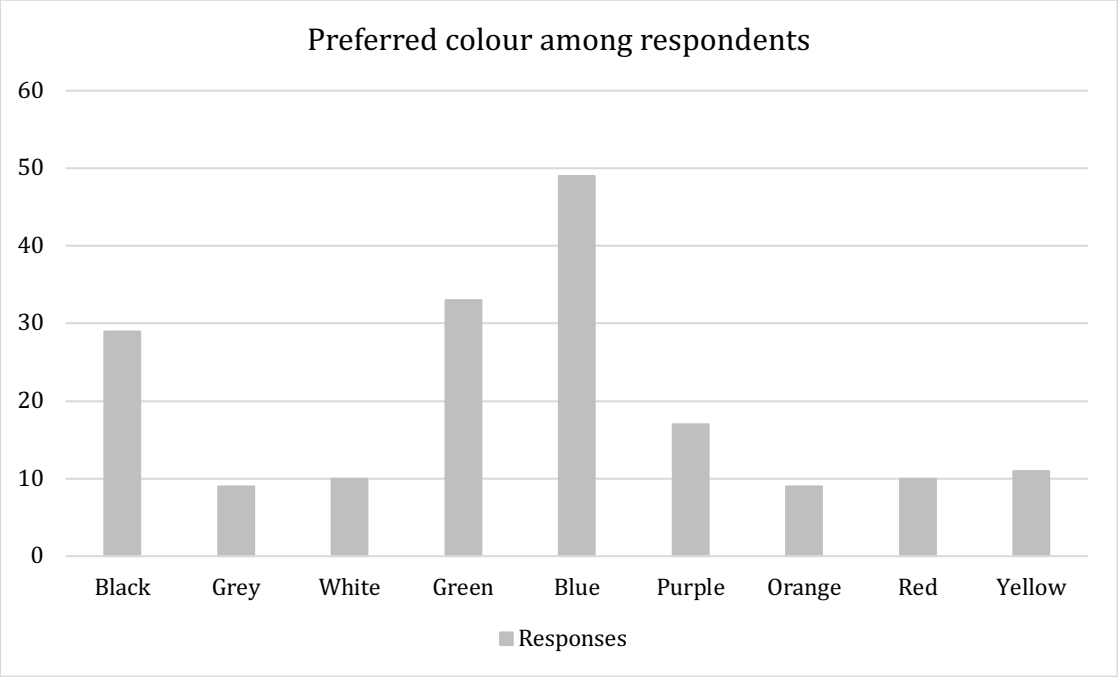
Regarding Buying intention, for the question "Colour is prime reason to buy a particular product" the average answer was 2,53; for the question "When the colour of

a product appeals, I feel a strong urge to purchase it" the average answer was 3,05; and finally for the question "When I see a new product with striking colours I usually buy it" the average answer was 2,44.

Finally, regarding Brand Recognition, for the question "Colour can increase ability to recognize brands" the average answer was 4,54; for the question "Being able to differentiate between product/brand colours" the average answer was 4,12; for the question "Colour is a good way to distinguish one brand from another" the average answer was 4,29; for the question "When I see a new or different colour brand I often pick it" the average answer was 3,41; and finally for the question "While buying an unfamiliar brand its colour helps me in making the decision" the average answer was 3,05.

Analysis of Preferred Colour

Through the analysis of the data, it can be concluded that the most preferred colour among the respondents is blue (27,7%) and the least preferred colours are grey (5,1%) and orange (5,1%).



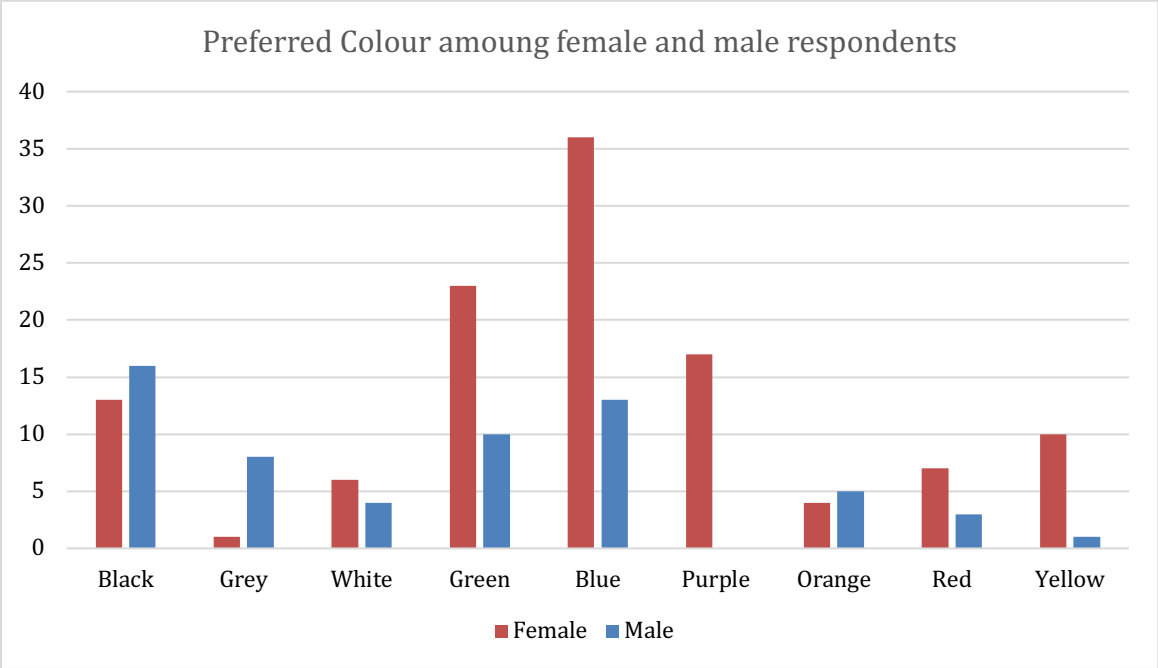
Graph 3 - Preferred colour among respondents

Source: SPSS (author´s elaboration)

Furthermore, it was established that blue was preferred by females (31%) over males (22%) with a significant difference.

Analysis of Preferred Colour regarding gender

For the female respondents, the most preferred colour was blue, and the least preferred colour was grey. Regarding the male respondents, the most preferred colour was black, and the least preferred colour was orange.



Graph 4 - Preferred colour among female and male respondents

Source: SPSS (author´s elaboration)

In order to access if there is a significant difference between genders regarding colour preference crosstabulation and chi-square test was conducted.

Chi-square test and Crosstabulation are used to analyse relationships between two categorical variables (Ugoni & Walker, 1995).

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	33.238[a]	8	<0.001
Likelihood Ratio	38.590	8	<0.001
N of Valid Cases	177		

Table 4 - Chi-square test between preferred colour and gender

Source: SPSS (author´s elaboration)

		Gender		Total
		Female	Male	
Preferred Colour	Black	13	16	29
	Blue	36	13	49
	Green	23	10	33
	Grey	1	8	9
	Orange	4	5	9
	Purple	17	0	17

	Red	7	3	10
	White	6	4	10
	Yellow	10	1	11
Total		117	60	177

Table 5 - Crosstabulation between Preferred colour and Gender

Source: SPSS (author´s elaboration)

The p-value shows the likelihood of finding a chi-square value that is as severe or more extreme than the observed value. Since p-value is less than 0.001, this indicates that there is a difference between genders regarding colour preference, hence hypothesis 1 was accepted.

Regarding warm (orange, red, and yellow), cool (green, blue, and purple) and neutral (black, grey, and white) colour groups, it can be concluded that females preferred cool colours, contrary to males that preferred neutral colours.

	Female	**Male**
Black	11,1%	26,7%
Grey	0,9%	13,3%

White	5,1%	6,7%
Green	19,7%	16,7%
Blue	30,8%	21,7%
Purple	14,5%	0%
Orange	3,4%	8,3%
Red	6,0%	5,0%
Yellow	8,5%	1,7%

Table 6 - Percentage of Preferred colour per Gender

Source: SPSS (author´s elaboration)

Analysis of Preferred Colour regarding age

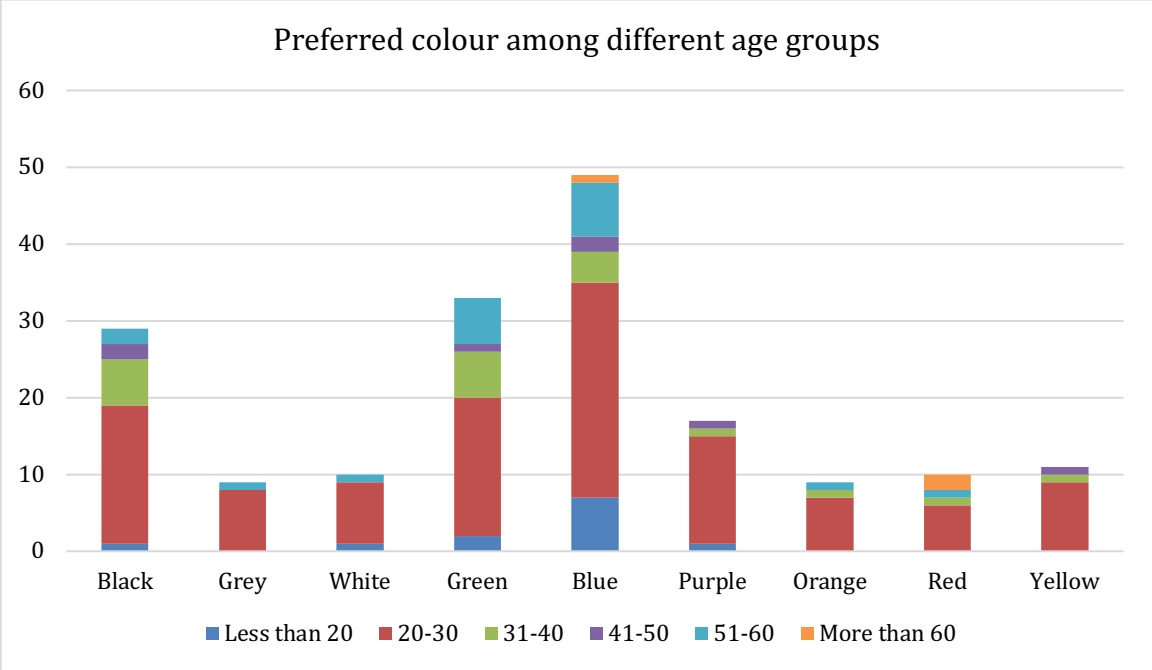


Table 7 - Preferred colour among different age groups

Source: SPSS (author´s elaboration)

It can be observed that the most preferred colour for the age group of less than 20 years old is blue (58,3%), for 20-30 blue as well (24,1%), for 31-40 green and black (30%), for 41-50 blue and black (28,6%), for 51-60 blue (36,8%) and finally for more than 60 years old red (66,7%).

On the one hand, there is a slight decrease on the preference of the colour blue along the years, starting with 58,3% (Less than 20) and ending with 33,3% (More than 60). On the other hand, there is a significant increase on the preference of the colour

red, starting with 0% (Less than 20) and ending with 66,7% (More than 60), as it can be observed on table 8 .

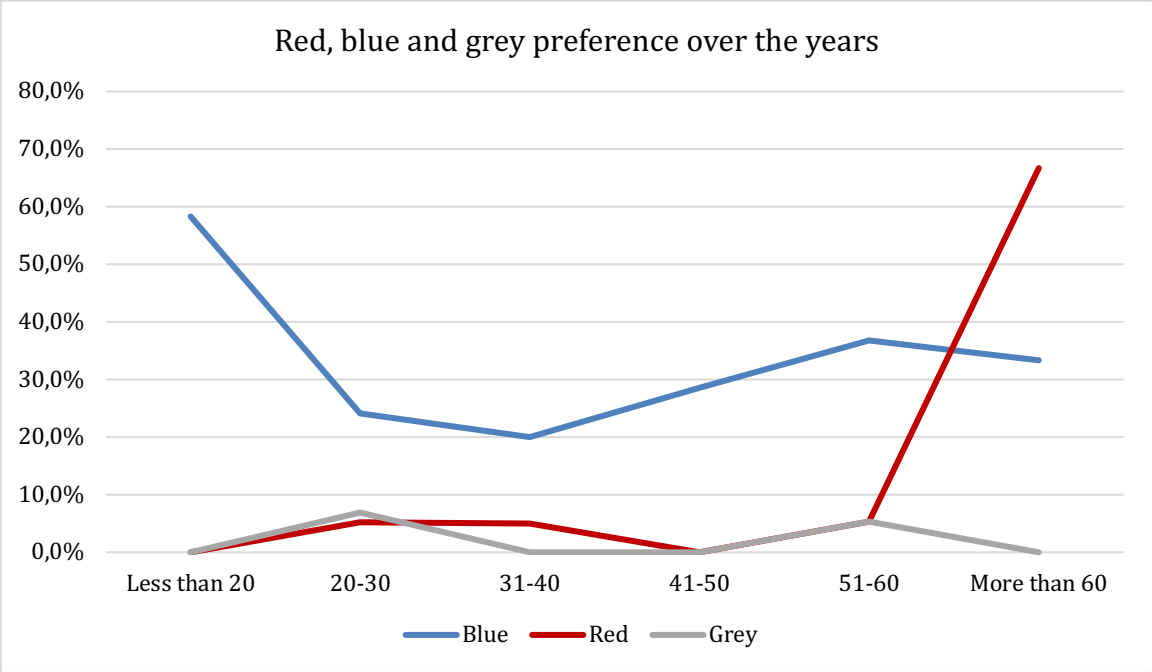


Table 8 - Red, blue and grey preference over the years

Source: SPSS (author´s elaboration)

Regarding warm, cool, and neutral colours, after the analysis it can be concluded that besides the age group of more than 60 years old, every age group prefers cool colours over warm and neutral. The age group of more than 60 years old prefers warm colours.

		Less than 20	20-30	31-40	41-50	51-60	More than 60
Black	*% within age*	8,3%	15,5%	30%	28,6%	10,5%	0%
Grey	*% within age*	0%	6,9%	0%	0%	5,3%	0%
White	*% within age*	8,3%	6,9%	0%	0%	5,3%	0%
Green	*% within age*	16,7%	15,5%	30%	14,3%	31,6%	0%
Blue	*% within age*	58,3%	24,1%	20%	28,6%	36,8%	33,3%
Purple	*% within age*	8,3%	12,1%	5%	14,3%	0%	0%
Orange	*% within age*	0%	6%	5%	0%	5,3%	0%
Red	*% within age*	0%	5,2%	5%	0%	5,3%	66,7%
Yellow	*% within age*	0%	7,8%	5%	14,3%	0%	0%

Table 9 - Preferred colour within different age groups

Source: SPSS (author´s elaboration)

Influence of packaging colour on consumer's buying intention and brand recognition

To determine whether there was a connection between packaging colour, buying intention, and brand recognition, Pearson's correlation was used, since Pearson´s correlation is a statistical measure used to assess the strength and direction of the linear relationship between two continuous variables (Sedgwick, 2012).

		Packaging Colour	Buying Intention	Brand Recognition
Packaging Colour	Pearson Correlation	1	0,485**	0,588**
	Sig. (2-tailed)		<0,001	<0,001
	N	177	177	177
Buying Intention	Pearson Correlation	0,485**	1	0,536**
	Sig. (2-tailed)	<0,001		<0,001
	N	177	177	177
Brand Recognition	Pearson Correlation	0,588**	0,536**	1
	Sig. (2-tailed)	<0,001	<0,001	
	N	177	177	177

** Correlation is significant at the 0,01 level (2-tailed)

Table 10 - Pearson's Correlation between Packaging colour, Buying intention and Brand recognition.

Source: SPSS (author's elaboration)

According to the results, there is proven connection between the three variables.

Since there was a significant correlation between the variables, regression analysis was made to assess the influence of one variable over the other.

	β	t	Sig.
(Constant)		-1,417	0,158
Packaging Colour Preference	0,485	7,332	<0,001

Dependent Variable: Buying Intention

Table 11 - Regression analysis between Packaging colour and Buying intention.

Source: SPSS (author's elaboration)

The change in the dependent variable (purchase intention) for each unit change in the independent variable (desire for packing colour) is represented by the beta coefficient. The preference for packing colour in this case has a beta coefficient of 0.485. This indicates that, on average, the estimated buying intention improves by 0.485 units for every unit increase in packing hue choice. Furthermore, the beta coefficient's t-value is 7.332, and its significance level is 0.001. This shows that there is statistically significant correlation between packaging colour preference and purchase intention.

In conclusion, based on the results of the regression analysis, there is a statistically significant association between packaging colour and buying intention, thus hypothesis 2 was accepted.

	β	t	Sig.
(Constant)		3,348	<0,001
Packaging Colour Preference	0,588	9,620	<0,001

Dependent Variable: Brand Recognition

Table 12 - Regression analysis between Packaging colour and Brand recognition.

Source: SPSS (author's elaboration)

The change in the dependent variable (brand recognition) for each unit change in the independent variable (desire for packing colour) is represented by the beta coefficient. The preference for packing colour in this situation has a beta coefficient of 0.588. This indicates that the expected brand recognition score rises by 0.588 units on average for every unit increase in packaging colour preference. Furthermore, the beta coefficient's t-value is 9.620, and its significance level is 0.001. This demonstrates the statistical significance of the association between preferred packaging colours and brand identification.

In summary, a statistically significant association exists between packaging colour and brand recognition based on the findings of the regression analysis, in consequence hypothesis 3 was accepted.

Influence of different colours (warm, cool and neutral) on consumer's Buying Intention

In order to access the influence of the different colour groups on consumer´s buying intention, A-NOVA test was conducted.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2,712	2	1,356	1,508	0,244
Within Groups	156,459	174	0,899		
Total	159,171	176			

Table 13 - A-NOVA test between buying intention and the different colour groups.

Source: SPSS (author's elaboration)

In A-NOVA test, F indicates how much variability exists between and within groups. A lower F-value means that there is no discernible difference between the within-group and between-group variability. The observed difference between the groups is probably the result of chance rather than a real difference because the F-value is low and the corresponding p-value (Sig) of 0,244 is higher than 0.05 (a standard significance threshold).

Additionally, LSD test (Least Significant Difference) was carried out in order to comprehend the differences found in A-NOVA test, as shown in table 14.

					95% Confidence interval	
Colour group	**Colour group**	**Mean difference**	**Std. Error**	**Sig.**	**Low Bound**	**Upper Bound**
Neutral	*Warm*	-0,175	0,221	0,429	-0,61	0,26
	Cool	-0,289	0,167	0,085	-0,62	0,04
Warm	*Neutral*	0,175	0,221	0,429	-0,26	0,61
	Cool	-0,114	0,198	0,564	-0,50	0,28
Cool	*Neutral*	0,289	0,167	0,085	-0,04	0,62
	Warm	0,114	0,198	0,564	-0,28	0,50

*The mean difference is significant at the 0,05 level

Dependent Variable: Buying Intention

Method used: LSD

Table 14 - LSD (Least Significant Difference) between colour groups and buying intention.

Source: SPSS (author's elaboration)

According to the results it is concluded that there is no significant difference between buying intention for warm and neutral colours, cool and neutral colours and warm and cool colours, therefore hypothesis 4a, 4b and 4c were rejected.

5.DISCUSSION

The main objective of this study was to access the influence of packaging colours on consumer behaviour.

The specific objectives were to identify the preferred colour based on the packaging design; to access colour preference based on gender; to access colour preference based on age; to understand the influence of colour on consumer´s buying intention; to understand the influence of packaging colour on consumer´s ability to recognize brands.

After data analysis was conducted, it was accessed that hypothesis 1 “There is a significant difference between the colour preference based on gender” was accepted; hypothesis 2 “Colour positively influences consumer´s buying behaviour” was accepted; hypothesis 3 “Colour positively impact brand recognition” was also accepted; hypothesis 4a, 4b and 4c “There is a significant difference in customer´s buying intention for products with warm colours and cool colours / warm colours and neutral colours / neutral colours and cool colours were all rejected; and finally hypothesis 5 “Packaging colour positively impacts brand recognition” was accepted.

According to this study and in agreement with Rathee and Rajain (2019) and Westland and Shin (2015), the most preferred colour regarding packaging among respondents was blue (27,7%). Thus, an accordance is noted in consumers preferences for colour blue in the latest years.

The preference for the colour blue could be explained by multiple factors. Blue is often associated with calmness and relaxation and that may be a reason for people to have a preference for the colour (Farabi, 2021). In addition, this study was conducted in the Portuguese scenario and according to Franco et al. (2019), tourists have the impression that Portugal is a colourful nation. Also, the colour blue can be easily associated with the colour of azulejos, the colour of the sea and other elements important to the Portuguese culture (Cerrato, 2012; Hurlbert & Ling, 2007).

Furthermore, personal association may lead people to prefer the colour blue and marketing can play a role in that having into consideration that blue is commonly used in marketing and branding, making it more recognizable.

Taking into consideration this study and previous studies it is noted that there is a consistent preference for blue among consumers over the last years.

Regarding the colour preference among genders, a significant difference was proven between colour preferences for women and men. Furthermore, it was accessed that the preferred colour for the female gender was blue and for the male gender was black.

In the one hand, women preferred blue more than man (31%-22% respectively) in contradiction to previous studies (Helson & Lansford, 1970; Hurlbert & Ling, 2007) that concluded that cool colours like blue and green were preferred by males over females. On the other hand, in agreement with previous studies (Rathee & Rajain, 2019) black was preferred by men over women.

The colour preference for blue by women over men that, as stated before, goes in contradiction with previous, and could come as a surprise, not only because of what previous studies concluded but also because of the social association of blue usually with boys/men and pink usually with girls/women. It is not possible to access the reasons behind this change in colour preference (women over men) over the last four years (Rathee & Rajain, 2019) but psychological factors may be part of the answer.

As stated before, blue is usually associated with calmness and relaxation (Farabi, 2021) as well as natural elements such as the sky and the ocean (Cerrato, 2012; Hurlbert & Ling, 2007) and considering that there was a global pandemic followed by multiple lockdowns maybe people started looking for more calm and relaxed influences as well as to be more connected with nature. Since the colour blue transmits all these factors it can be part of the reason for women to start preferring blue over warmer tones and prefer blue over men.

Furthermore, some explanations for these contradicting results could be related to gender stereotypes since colour preference and gender stereotypes change throughout time. This study may have been conducted during a time of change in gender-related preferences for blue. This might happen because of a change in social norms, a change in gender roles from the women's side, or because of current trends.

As for the connection between age and colour preference it was concluded that older age groups prefer different colours than the younger age groups agreeing with (Jaint et al., 2010). Blue, as well as the cool colour group, was the preference on all age groups besides the more than 60-year-old group that preferred red. These conclusions disagree with previous studies (Garth & Porter, 1934) that affirm that children usually prefer red over blue and that that preference shifts as they get older and prefer blue over red. In this study, people with less than 20 years old until 60 years old stick with blue and only then shift to red. That said, the number of people over 60 years old was small and because of that colour preference could be biased for that age group, if so, maybe blue would be the preferred colour among all age groups.

Regarding the results of this study and in contradiction with previous studies there is a shift from preference of red over blue in elders. These results agree with D'Hondt and Vandewiele (1983) that stated that in adulthood, contrary to childhood, red gains popularity over blue. The opposite would be expected like in previous studies (Choungourian, 1968). Since blue is often associated with calmness and tranquillity and red is often associated with excitement and energy (Cerrato, 2012), it would be

expected that like previous studies concluded, red would be the preferred colour among younger generations, with a shift to blue on the older generations.

Furthermore, in agreement with D'Hondt and Vandewiele (1983) there was an increase in the preference for the colour green over red as people get older. The only contradictory part is that that increase over red is noted until de age group of more than 60 years old, from that age group forward red takes the lead.

Regarding colour groups and age groups it can also be concluded that cool colours are the most consistent colour group since it is the preferred one for all age groups except for more than 60 years old.

Regarding the role of colour in consumer´s buying intention it can be concluded that there is a statistically significant association between packing colour and buying intention. The findings of this study demonstrate that colour influences consumers' decisions on which things to buy significantly. This fact was also noted in earlier studies (Ares & Deliza, 2010; Priluck Grossman & Wisenblit, 1999; Rathee & Rajain, 2019), where it was found that the colour of a product, advertising, or shop setting significantly influenced consumer behaviour.

Furthermore, after the analysis of the three different colour groups, it was concluded that there was no significant difference between buying intention for warm and neutral colours, cool and neutral colours and warm and cool colours.

This conclusion is contrary to the conclusions of Rathee and Rajain (2019) where it was accessed that there was no substantial difference between cool and neutral colours

but there was a significant difference between warm and cool colours and between warm and neutral colours.

A small sample size may have reduced the statistical power to identify significant effects, which could be the cause of the absence of significant differences between colour groups. A bigger sample size could provide sufficient statistical power to detect any significant differences. Furthermore, colour's impact on buying intention may be reliant on other factors. For instance, certain product categories or target audiences may have more noticeable effects of colour on buying intention. In addition, individual tastes and perceptions differ, and there may be a lot of intragroup variation that hides the overall group differences.

Regarding brand recognition, perhaps there would be differences between the 3 colour groups. Since brands can efficiently define their identity, convey their moods, and build relationships with customers through the use of colour (Labrecque & Milne, 2012), customers usually have a top-of-mind brand and associate colours with brands. That would work as well for the three different colour groups. On the other hand, when it comes to buying intention, there wasn’t a difference between the colour groups. This could be, again, explained by a smaller sample size than previous studies, as well as by some other factors. People may have a

Finally, regarding the role of colour in consumer´s brand recognition it can be concluded that there is a statistically significant association between packing colour and brand recognition.

These conclusions agree with previous studies that also accessed that there was a strong association between colour and brand recognition (Kauppinen-Räisänen, 2014; Rathee & Rajain, 2019; Schmitt & Simonson, 1997).

A consistency is noted on the influence of colours in brand recognition throughout the years.

These are important findings in marketing, in this case in the Portuguese scenario. Since today's market is extremely globalized and competitive, brands need to produce innovative strategies in order to impact consumers and establish brand awareness and connections with consumers (Sliburyte & Skeryte, 2014). In marketing, persuasion is key (Farabi, 2021), and using packaging colours is a mean to reach that awareness and connection.

According to Priluck Grossman and Wisenblit (1999), consumers acquire colour associations through experience, which causes them to favour particular colours for particular product categories and link particular colours to specific brands, explaining why some of the most well-known brands in the world have become associated with particular colours due to their prominent use in branding and packaging, such as Coca-Cola's use of red and Starbucks' use of green.

Marketers create brand recognition by using a specific combination of colours and shapes to create a brand stamp (Beta, 2020). If all packages had the same colour, consumers wouldn´t be able to differentiate products and respective brands as easily. With the correct use of colour, customers can quickly and readily recognise the brand

they're looking for among a sea of similar products thanks to effective colour manipulation (Westland, 2015).

Regarding brand recognition for the three colour groups (warm colours, cool colours and neutral colours), it was not tested if there was a difference between consumer´s brand recognition for the different groups.

The main finding of this study is that packaging colours indeed influence consumer's buying intention and brand recognition. Therefore, the proper use of packaging colour for a specific target audience is crucial in order to convert sales and to become the top-of-mind brand when thinking of a specific colour, making it possible to identify and differentiate a specific brand based on its packaging colour alone.

6.CONCLUSION

In conclusion, the purpose of this study was to understand how packaging colours affect consumer's behaviour. The specific objectives of the study were to identify the preferred colour based on the package design, to assess colour preference based on gender, to assess colour preference based on age, to acknowledge the influence of packaging colour (warm, neutral and cool) on consumer's buying intention and to understand the influence of packaging colour in consumer's ability to recognize brands.

Although the main conclusions of this study show that packaging colours do influence consumer's buying intention and brand recognition, some of the finding both agree and disagree with previous studies regarding the how the packaging colours influence consumers.

Regarding the first objective, it was discovered that customers preferred the colour blue, which is consistent with results from earlier studies. This implies that the use of blue in packaging positively affects customer attraction and preference. This finding is very important for brands to be aware of when entering the Portuguese market with new products. By knowing that usually blue is the preferred colour among consumers, entering the market with a product where its package contains blue can contribute for a greater acceptance of the product and desire from the consumer.

The second goal investigated how gender affects colour preference. It's interesting to note that there was a big gap between the genders. In contrast to other research,

women showed a preference for blue, whilst men tended to tilt towards black. In addition, compared to men, women showed a higher preference for the colour blue. These results highlight the need of taking gender preferences into account and adapting the marketing strategy accordingly.

Examining the connection between age and colour preference was the third objective. The findings showed a significant difference in age-related colour preferences. Up until the age of 60, blue began to emerge as the favoured colour, but after that, a movement towards red was noticed. This propensity for different colours with increasing age highlights how crucial it is for brands to know their target audience and adapt their packaging accordingly. Appropriating the product´s packaging to the target audience, taking into consideration these and previous finding will produce better results for brands.

The study looked at how packaging colour affected consumers' buying intentions for its fourth objective. The colour of the package was positively associated with buying intention, supporting earlier findings. It is known through the study of colour psychology that colours highly impact consumers (Farabi, 2021; Ott, 1974; Rodriguez, 2022) and that most purchase decisions are made based solely on colour (DR.SAJID REHMAN KHATTAK et al., 2021; Hunjet & Vuk, 2017a; S. Singh, 2006b). That said, packaging colours is a really crucial part of packaging design and maybe one of the most important, so adapting packaging colour to the consumer is crucial for brands to be successful and lead consumers to buy. Contrary to a prior study, no discernible distinction between the three colour groups (warm, neutral, and cool colours) and their

effects on purchasing intention was found. This suggests that various colour groupings may influence customer behaviour in terms of purchasing intention in a similar manner.

The fifth objective researched the impact of packaging colour on brand recognition. In line with earlier studies, the findings supported the relationship between packaging colour and brand recognition and how positively packaging colour impacts brand recognition. As stated previously, colours highly impact consumers (Farabi, 2021; Ott, 1974; Rodriguez, 2022) and consumers acquire colour associations through experience (Priluck Grossman & Wisenblit, 1999b), which causes them to favour particular colours for particular product categories and link particular colours to specific brands. In example, brands like Gatorade, Apple, and M&Ms, by introducing new coloured product lines, have successfully leveraged from this property of colour in relation to brand recognition (Garber et al., 2000). On the other hand, by switching from the traditional red colouring associated with cold drinks to blue, Pepsi has attempted to create new colour associations (Priluck Grossman & Wisenblit, 1999b).

Thus, again, in order for Portuguese brands to survive in the current competitive and globalized market, connecting with consumers through packaging colours and differentiating themselves through it is pivotal.

Although there are a lot of studies on colour, marketing-related colour theories are still in their infancy. Colour associations and meanings have been the subject of numerous research (Aslam, 2006; Kauppinen-Räisänen & Luomala, 2010), still these studies primarily studied the symbolic meanings and associations of colours in various

cultures. However, the most important is to comprehend the meanings of colours as a crucial component of packages in addition to understanding individual differences in colour preferences.

In general, this study adds to the body of knowledge already available about how packaging colours affect customer behaviour, in this case in the Portuguese scenario. It emphasises the necessity for Portuguese brands and marketers to take gender and age related preferences into consideration when designing packaging.

Additionally, it highlights how important packaging colour is in influencing buying intention and brand recognition. The dynamic relationship between packaging colours and customer behaviour should be further investigated in future studies, taking into account other factors like other cultures and different product categories.

Brands that are entering or are already a part of the Portuguese market may optimise their packaging design strategies to improve product attractiveness, influence purchase decisions and brand recognition by studying the effects of packaging colours on customer behaviour. Understanding the consumer is truly the best way for brands to create a product packaging that consumer will desire and also recognize among the vast offer of products. With this and previous studies on the matter, brands can tailor their packaging specifically to their customers, having into consideration age and gender and their colour preferences.

These study's conclusions have application for Portuguese marketers and brands functioning in the Portuguese market and offer useful information for making choices

regarding packaging colours in order to survive and thrive in the current competitive market.

7. LIMITATIONS AND FUTURE RESEARCH

The present study contributes to the knowledge on how packaging colours affect customer behaviour. Still, there are some limitations encountered that should be taken into consideration when interpreting the conclusions and findings of the study.

The first limitation encountered regards the sample size of a specific age group and gender. The age groups of more than 60 years old add a reduces sample size, hence the results and finding of said age group could be biased. The same occurs for the male gender which add a smaller sample size than women.

Regarding methodology, a quantitative approach using a self-administrative online questionnaire to collect data. This data collection technique enables a larger sample size but at the same time could produce biased responses.

This study produced important and significant findings about how packaging colours affect consumer behaviour. Future study can build on these findings and study this subject more thoroughly.

Having in consideration not the age groups presented in this study, but generational cohorts could be interesting in future research in order to comprehend the influence of packaging colours on Millennials, Generation Z and Baby Boomers' behaviour. This would make it possible for brands to appropriate their strategies and package design to different generational cohorts.

The impact of various colour groups, such as warm, neutral, and cool colours, on brand recognition is another that could be furthered study. In-depth investigation into the precise impacts of colour groups on brand recognition could be done in the future in order for marketers to further understand how different colour groups might improve brand recognition.

Replicating this kind of research across different product categories would also be beneficial. Depending on the type of product being promoted, different packaging colours may have different effects on the consumer. Researchers can develop a better knowledge of how colour preferences and the influence of packaging colours vary across sectors by carrying out similar studies in several product categories.

Since this study was conducted on the Portuguese context and using only Portuguese people, an interesting subject for future research would be considering how cultural variations affect colour preferences and consumer behaviour. Colours can have a variety of symbolic meanings in different cultures, so investigating how cultural influences affect colour choices and consumer reactions to packaging colours would offer insightful information.

Understanding the impact of packaging colours on consumer behaviour can be improved by addressing these directions for future research, opening the door for more successful marketing campaigns and packaging designs that are tailored to the preferences of the consumer.

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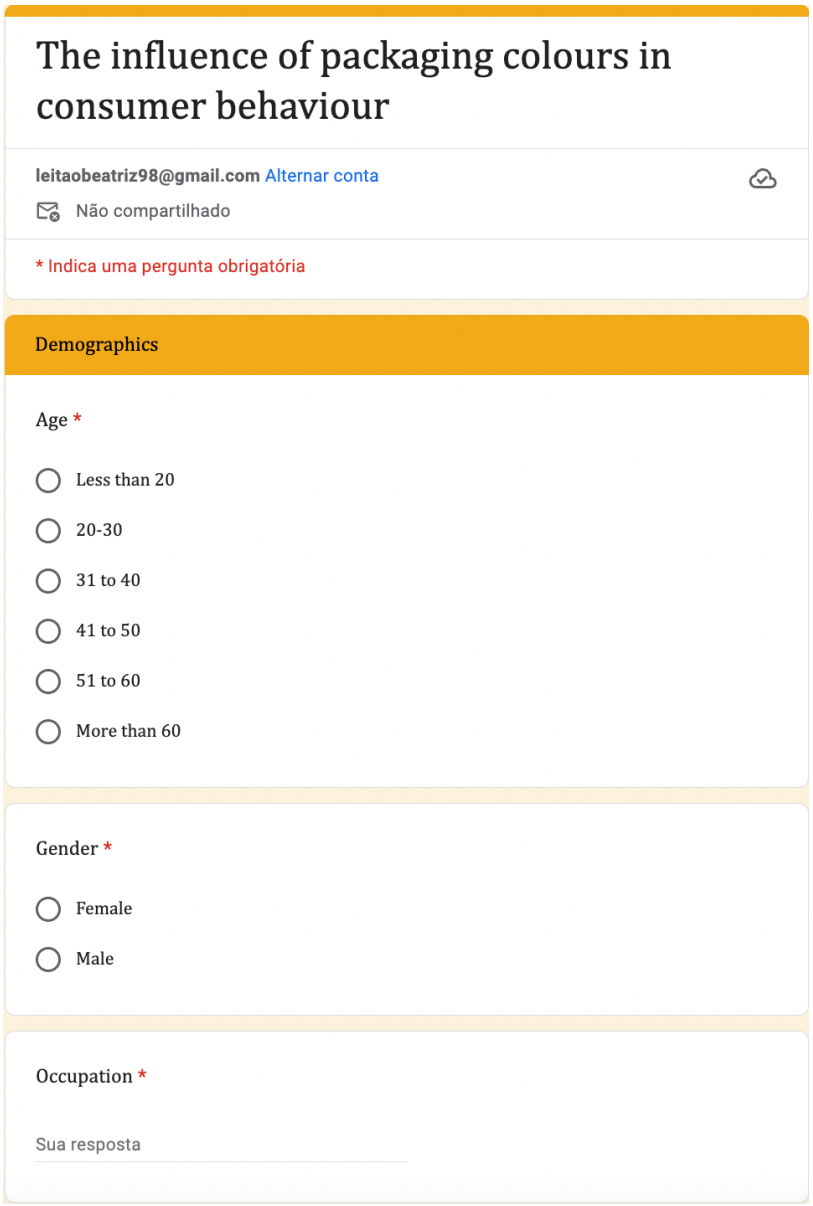
APPENDICE

QIESTIONNAIRE



The influence of packaging colours in consumer behaviour

leitaobeatriz98@gmail.com Alternar conta

Não compartilhado

* Indica uma pergunta obrigatória

Demographics

Age *

- Less than 20
- 20-30
- 31 to 40
- 41 to 50
- 51 to 60
- More than 60

Gender *

- Female
- Male

Occupation *

Sua resposta

Appendice 1 - Questionnaire: Demographic section

The influence of packaging colours in consumer behaviour

leitaobeatriz98@gmail.com Alternar conta

Não compartilhado

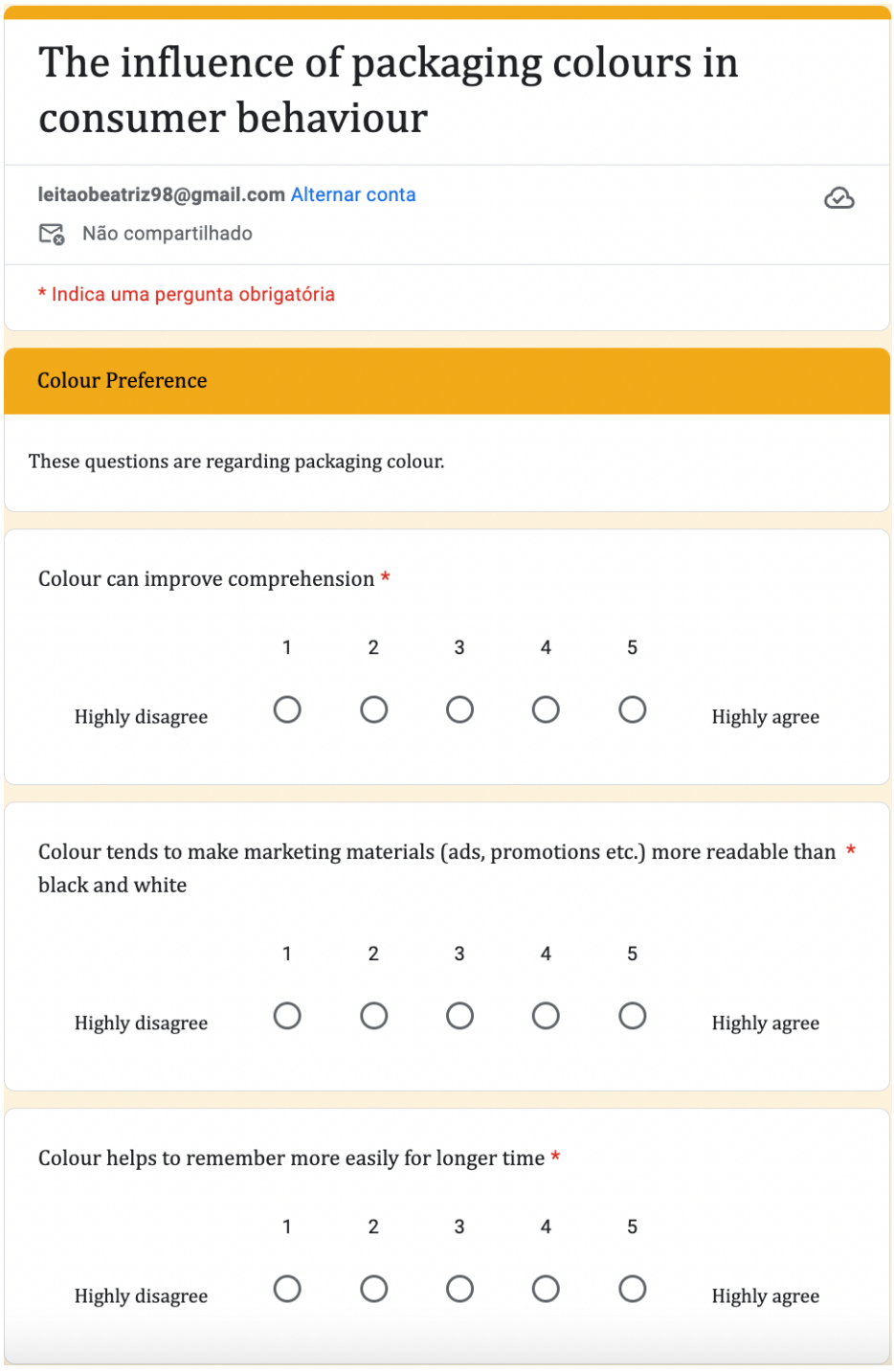
* Indica uma pergunta obrigatória

Preferred Colour

What is your preferred colour? *

- White
- Grey
- Black
- Orange
- Red
- Yellow
- Green
- Blue
- Purple

Appendice 2 - Questinnaire: Preferred colour



The influence of packaging colours in consumer behaviour

leitaobeatriz98@gmail.com Alternar conta

Não compartilhado

* Indica uma pergunta obrigatória

Colour Preference

These questions are regarding packaging colour.

Colour can improve comprehension *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

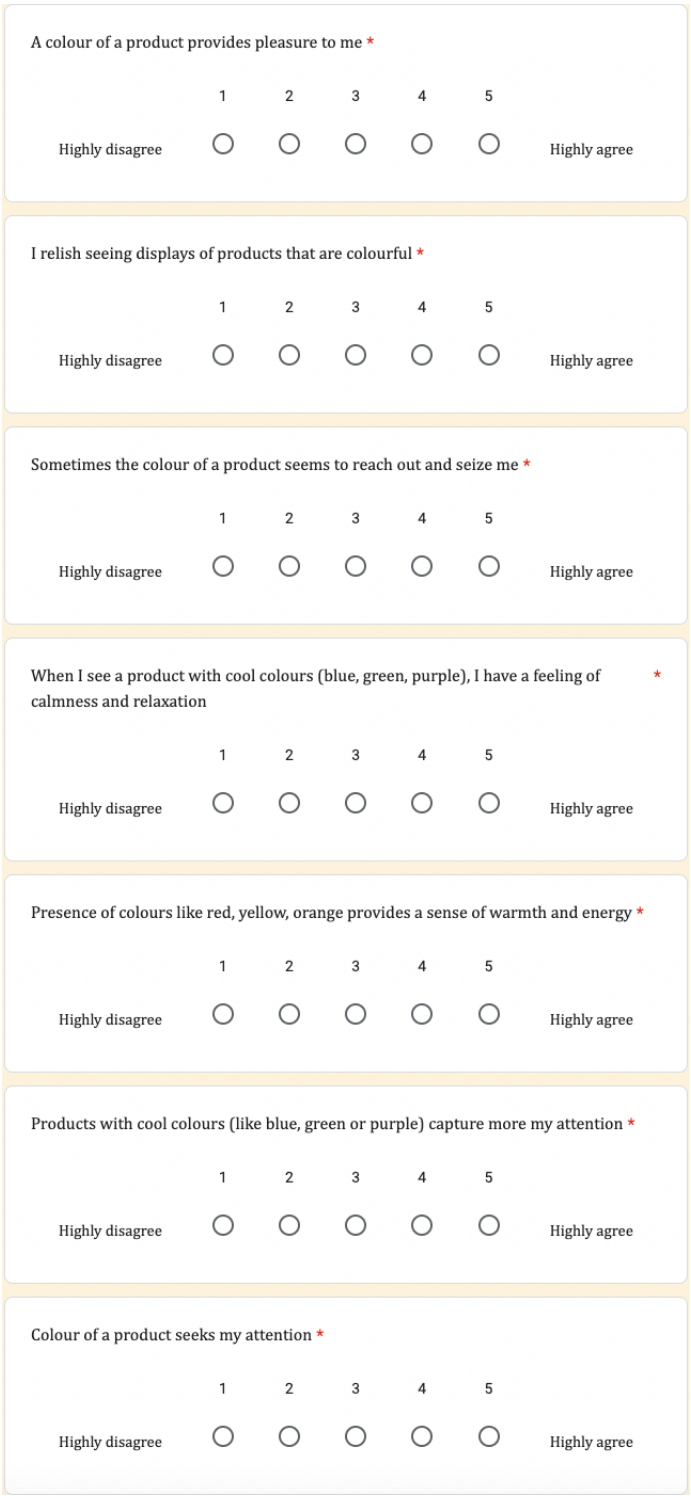
Colour tends to make marketing materials (ads, promotions etc.) more readable than black and white *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

Colour helps to remember more easily for longer time *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

Appendice 3 - Questionnaire: Colour preference section



Appendice 4 - Questionnaire: Colour preference section (cont.)

The influence of packaging colours in consumer behaviour

leitaobeatriz98@gmail.com Alternar conta

Não compartilhado

* Indica uma pergunta obrigatória

Buying Intention

These questions are regarding packaging colour.

Colour is prime reason to buy a particular product *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

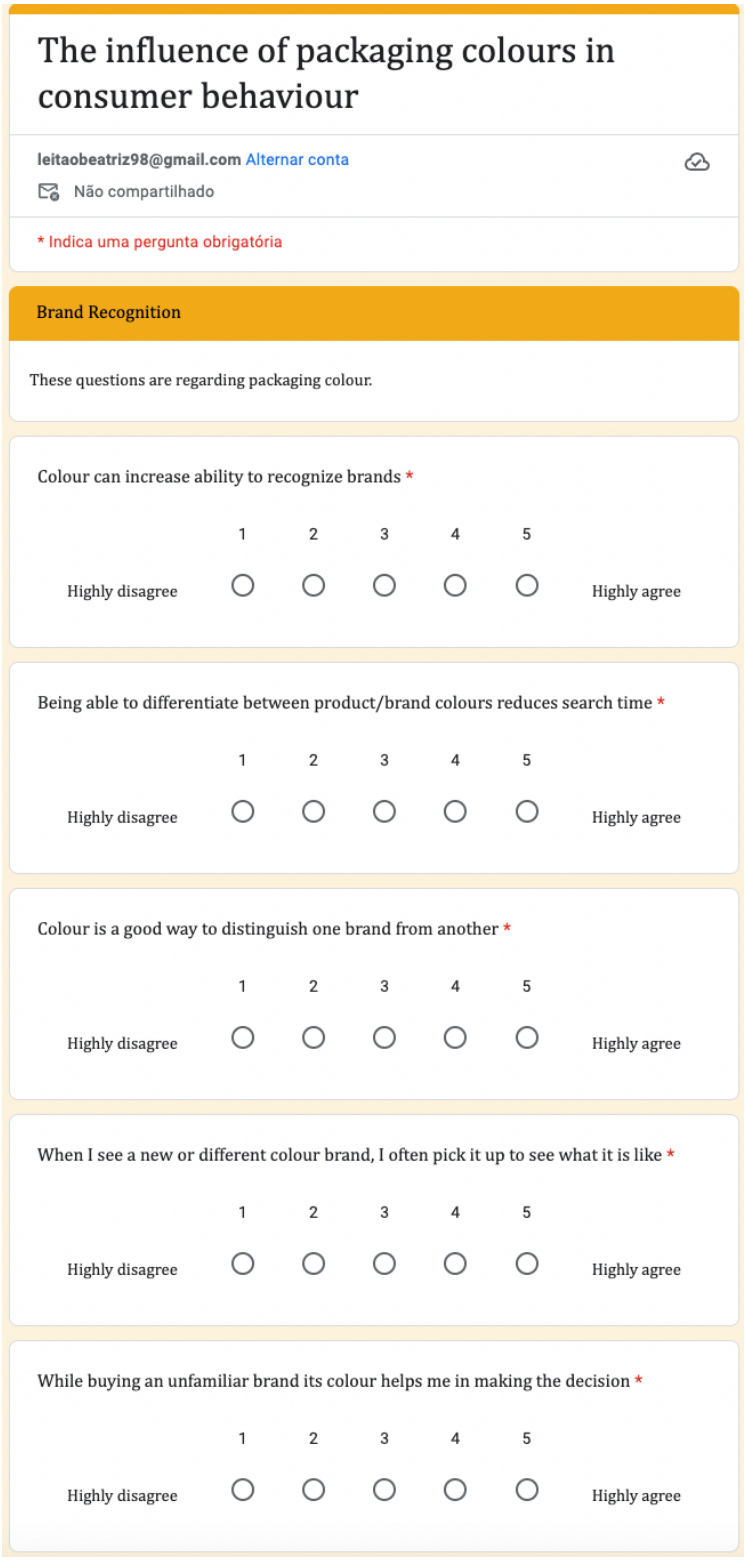
When the colour of a product appeals, I feel a strong urge to purchase it *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

When I see a new product with striking colours, I usually buy it *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

Appendice 5 - Questionnaire: Buying intention section



The influence of packaging colours in consumer behaviour

leitaobeatriz98@gmail.com Alternar conta

Não compartilhado

* Indica uma pergunta obrigatória

Brand Recognition

These questions are regarding packaging colour.

Colour can increase ability to recognize brands *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

Being able to differentiate between product/brand colours reduces search time *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

Colour is a good way to distinguish one brand from another *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

When I see a new or different colour brand, I often pick it up to see what it is like *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

While buying an unfamiliar brand its colour helps me in making the decision *

	1	2	3	4	5	
Highly disagree	○	○	○	○	○	Highly agree

Appendice 6 - Questionnaire: Brand recognition section

DATA BASE

Age	Gender	Occupation	What is your pref	Colour can in	Colour tend	Colour helps	A colour of a	I relish see	Sometimes	When I see a	Presence c	Products with	Colour of a p	Colour is pri	When the colou	When I see a	Colour can inc	Being able	Colour is a g	When I see a	While buying
20-30	Female	Student	Blue	5	5	5	3	3	3	4	4	3	5	4	3	3	5	5	5	4	4
20-30	Male	Empresário	Grey	4	3	3	3	3	4	2	3	2	4	1	3	2	5	5	5	3	4
31 to 40	Male	Engenheiro	Blue	5	5	5	3	3	3	4	4	3	3	1	1	1	4	4	4	2	3
31 to 40	Female	arquitecta	Green	5	5	5	5	5	5	4	4	3	5	3	3	3	4	4	4	3	3
20-30	Female	Estudante-Trabalhadora	White	5	5	5	5	4	4	4	5	4	5	5	5	4	5	5	5	5	4
20-30	Female	Student	Green	5	5	5	5	4	4	3	4	4	4	3	4	2	5	5	5	3	3
20-30	Female	DBA	Purple	3	2	5	5	5	5	5	5	2	5	1	4	5	5	5	3	5	5
20-30	Female	Student	Green	4	5	4	3	4	4	4	4	4	4	3	3	3	5	5	4	3	3
20-30	Male	Engineer	Grey	4	4	3	5	3	4	4	5	2	5	4	2	2	5	4	4	5	4
20-30	Female	Student and worker	Blue	4	5	4	4	3	4	5	5	4	4	3	4	4	4	5	4	5	2
20-30	Female	Estudante	Purple	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20-30	Female	Trabalhador-Estudante	Green	4	3	4	4	4	5	3	3	5	5	4	4	2	5	5	5	4	3
31 to 40	Female	Teacher	Black	5	5	4	4	3	4	4	4	3	3	3	3	3	4	3	3	2	2
31 to 40	Female	Administration	Yellow	2	4	3	1	3	3	2	2	2	3	1	1	1	1	2	4	1	1
20-30	Female	Master student	Yellow	5	5	5	5	5	5	3	3	3	5	3	4	3	5	3	4	5	3
20-30	Female	Student	Black	4	3	4	4	4	3	5	4	4	5	2	3	3	5	4	5	3	5
20-30	Female	Account manager & Co	Purple	5	3	4	4	4	5	5	5	3	4	2	4	2	5	5	3	4	1
20-30	Female	Nurse	White	4	4	4	4	3	5	3	4	2	4	3	4	2	5	5	5	4	3
41 to 50	Male	Motorista	Black	5	5	5	4	3	3	2	2	2	3	1	1	1	2	2	2	2	1
20-30	Female	Student	Green	4	5	4	5	4	5	3	5	3	4	3	4	3	5	3	5	4	5
20-30	Male	Student	Orange	5	5	5	5	4	4	2	3	5	5	3	4	3	5	5	5	3	5
20-30	Female	Tourism information	Blue	3	5	4	4	4	3	3	4	4	4	2	2	2	4	4	5	3	3
20-30	Female	Trabalho - Arquitetura	Black	5	4	4	5	5	4	3	5	3	5	3	2	2	5	4	4	4	2
20-30	Female	Mkt manager	Blue	5	3	5	5	3	3	2	4	4	4	2	4	2	5	4	5	4	3
20-30	Male	Videografo	Grey	5	3	4	4	4	4	3	4	4	4	3	3	3	5	5	5	3	4
20-30	Female	Student	Green	3	1	4	5	3	4	4	4	4	4	2	3	3	5	3	2	3	2
31 to 40	Female	Biomedical Engineer	Green	5	5	5	4	5	5	4	5	1	5	3	3	2	5	5	4	2	3
20-30	Female	Marketing	Yellow	5	4	5	5	4	5	5	5	1	5	2	3	2	5	4	2	4	3
20-30	Female	Unemployed	Blue	4	4	5	5	5	5	4	4	4	5	4	4	4	5	4	5	3	3
31 to 40	Female	Medical doctor	Purple	5	4	5	4	3	3	4	4	4	4	2	2	2	4	3	3	3	3
20-30	Male	Starting a business	Blue	5	3	4	4	3	3	4	5	3	4	1	2	1	4	3	4	2	3
41 to 50	Female	Professora	Purple	5	4	4	5	4	3	3	4	3	3	1	2	1	3	2	2	1	1
51 to 60	Female	Administration	Green	4	5	5	4	4	4	3	4	2	5	1	3	1	5	4	4	4	3
51 to 60	Female	Administrativa	White	4	4	5	5	4	4	2	5	3	4	1	2	2	4	5	5	4	2
Less than 20	Male	Estudante	Black	4	2	4	4	3	5	4	5	1	3	2	4	2	5	2	4	3	3
Less than 20	Female	Student	Blue	5	4	5	4	5	4	4	4	5	4	3	4	2	4	4	4	4	4
Less than 20	Female	Student	Purple	3	2	4	3	3	4	2	2	3	3	1	2	1	4	4	4	3	2
Less than 20	Female	Estudante	Green	5	5	5	5	5	5	3	5	5	5	3	5	3	5	5	5	4	4
20-30	Female	Estudante	Green	3	4	4	5	4	4	3	2	5	5	3	4	2	3	2	3	2	4
20-30	Male	Student	Grey	5	5	5	5	5	5	4	5	2	5	5	4	4	5	5	5	5	5
20-30	Female	Student	Blue	2	4	5	4	4	3	4	3	4	4	2	2	2	5	5	5	4	2
31 to 40	Female	Entrepeneur	Black	3	2	4	4	3	4	2	3	2	4	2	2	3	4	3	5	4	3
Less than 20	Male	Student	Blue	5	4	5	4	3	2	4	4	3	4	1	2	1	5	4	5	4	1
20-30	Male	Student	Black	5	4	5	3	4	4	5	5	4	4	4	4	4	5	5	5	3	2
Less than 20	Female	student	Blue	4	5	4	4	5	5	3	4	4	4	3	4	4	5	4	5	3	4
20-30	Male	Tax consultant	Green	5	5	5	5	5	5	5	5	5	5	2	2	2	2	2	3	4	3
51 to 60	Female	Comercial director	Red	4	5	5	5	5	4	4	5	4	4	1	2	1	5	5	5	4	2
20-30	Male	Student	Grey	4	2	5	4	4	4	4	4	2	4	2	2	2	5	4	4	3	5
31 to 40	Female	Social media	Blue	3	5	5	5	5	2	4	4	4	4	3	3	2	5	4	5	4	4
20-30	Female	Student	White	5	5	5	4	4	4	3	4	2	5	3	2	2	5	4	5	3	2
20-30	Female	Master student	Purple	4	4	5	5	4	4	4	4	5	5	2	2	1	4	3	4	4	2
31 to 40	Male	developer	Green	4	2	3	3	2	3	4	4	3	3	2	2	1	3	2	4	2	2
20-30	Female	Student	Blue	5	3	5	5	4	3	4	3	5	5	2	3	1	5	5	5	3	3
20-30	Male	Software Engineer	Red	4	5	4	3	3	3	3	3	3	3	1	1	1	4	3	4	1	1
20-30	Female	Student	Blue	5	3	3	4	4	4	3	4	3	4	2	4	3	5	4	4	4	4
20-30	Male	Curator	Black	5	4	4	4	3	3	1	1	1	3	2	2	1	5	4	4	2	1
20-30	Female	Student	Yellow	5	4	5	5	4	4	5	5	3	5	3	4	3	5	4	4	5	4
20-30	Female	Law student	Blue	4	5	5	5	4	4	5	4	5	5	2	2	2	5	5	5	3	3
31 to 40	Female	Jurist	Black	4	2	3	3	4	4	3	3	4	4	2	2	2	4	3	3	4	3
20-30	Female	Project Manager	Green	4	3	4	4	4	3	3	3	4	4	4	3	2	4	3	3	3	2
Less than 20	Female	Student	Blue	4	4	5	4	3	3	4	4	2	4	2	3	2	5	5	4	3	4
Less than 20	Female	Estudante universitário	Blue	3	5	5	3	4	3	3	4	3	3	1	2	2	4	4	5	1	1
20-30	Female	estudante	Green	4	5	5	4	4	5	3	4	3	5	3	4	3	5	4	5	4	3
20-30	Female	Master student	Grey	4	5	4	5	4	5	3	5	2	5	5	5	3	5	4	5	5	3
20-30	Female	Marketing Assistant	Orange	4	5	5	4	3	4	3	4	3	4	5	4	2	5	4	5	4	4
20-30	Male	Tourist guide	Blue	5	5	5	5	5	5	5	4	5	5	5	5	1	5	5	5	5	5
20-30	Female	Marketing assistant	Purple	5	5	4	4	5	4	4	5	3	4	3	3	3	5	3	5	3	3
20-30	Female	Marketing Manager	Green	4	2	4	4	3	3	5	3	4	4	1	2	3	5	5	4	3	2
20-30	Male	Técnico de manutenção	Black	4	3	5	4	3	4	3	4	3	4	3	4	2	5	4	4	3	4
20-30	Male	Digital Content Manage	Orange	4	4	4	4	3	3	4	4	2	4	3	3	3	4	4	4	4	4
41 to 50	Male	Empregado escritorio	Black	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
20-30	Female	Student	Yellow	5	5	5	4	5	5	3	3	4	5	3	5	3	5	4	5	5	5
31 to 40	Male	Operador de linha de er	Green	5	3	4	4	3	3	4	4	3	5	3	3	3	3	3	2	2	2
20-30	Female	Software engineer	White	5	3	3	3	2	2	2	3	2	2	2	1	1	4	4	4	1	1
20-30	Male	Engenheiro de Software	Black	4	5	4	4	3	4	2	2	2	3	1	3	3	4	4	2	3	3
20-30	Female	Programador	Green	4	3	3	3	3	2	4	4	3	3	3	2	2	3	2	3	2	2
20-30	Female	Enfermeira	Purple	5	5	5	4	4	4	4	4	4	4	3	4	4	5	4	5	3	3
20-30	Male	In my free time I go to th	Blue	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20-30	Female	Dependent worker	Orange	4	3	4	4	3	5	4	4	2	4	3	4	3	5	4	4	4	3
20-30	Female	Employed - Digital Marke	Purple	5	4	4	4	4	4	3	4	4	5	4	4	2	5	4	5	3	3
51 to 60	Male	Contabilista	Green	4	4	4	4	4	3	5	5	5	4	3	3	3	4	4	4	4	3
51 to 60	Female	Teacher	Blue	4	4	3	4	3	3	4	4	4	4	4	3	3	4	3	4	3	3
More than 60	Female	Empresária	Red	5	3	5	4	4	5	4	5	4	4	3	4	4	5	5	5	4	4
51 to 60	Female	Nurse	Orange	4	5	5	5	4	4	2	4	4	5	1	4	2	5	4	5	4	2
51 to 60	Female	consultora QAS	Green	5	3	3	3	3	4	3	3	3	5	1	3	1	4	3	5	4	1
More than 60	Male	Liberal entrepeneur	Red	5	5	5	5	4	4	4	5	3	5	2	3	3	5	4	5	4	4

Appendice 7 - Data base

51 to 60	Male	Retired	Blue	3	5	4	4	4	3	3	3	2	3	1	1	1	4	4	4	1	3
51 to 60	Female	Public employee	Blue	5	4	4	3	4	4	4	5	4	4	1	3	2	5	5	4	5	4
51 to 60	Male	Statistic	Grey	5	3	3	3	3	3	3	3	3	5	1	3	1	5	5	5	3	1
41 to 50	Female	Administrativa	Blue	4	5	4	3	1	3	5	5	5	4	2	2	3	5	4	4	3	3
51 to 60	Female	Engenheira Florestal	Black	4	5	5	3	3	3	4	4	3	4	1	2	1	4	4	4	3	4
51 to 60	Female	Chemistry	Blue	4	4	4	5	5	4	5	5	4	3	2	2	2	4	4	4	4	3
51 to 60	Female	Administrativa	Blue	4	4	4	5	5	4	5	5	5	5	3	5	4	5	5	4	4	4
51 to 60	Female	Farmacêutica	Green	5	5	5	4	3	4	3	4	3	4	1	2	2	5	5	4	4	3
51 to 60	Male	Manager	Green	5	4	5	2	5	5	4	5	3	5	2	1	3	5	5	5	5	3
20-30	Female	Student	Yellow	5	5	5	3	3	4	5	5	2	4	2	4	4	5	5	5	5	3
41 to 50	Female	Regulatory affairs office	Green	4	4	5	5	4	4	4	4	3	5	3	4	4	5	5	4	3	2
41 to 50	Male	Eng	Yellow	5	5	5	4	4	5	4	5	4	4	3	2	2	4	5	5	3	5
20-30	Female	Empreendedora	Blue	5	2	3	3	3	4	2	4	4	3	4	4	4	4	4	4	4	3
20-30	Male	Sports seller	White	5	5	5	5	5	5	4	4	2	5	5	5	3	5	5	3	5	5
20-30	Male	Working in web develop	White	5	4	4	4	4	3	4	4	2	4	4	4	2	5	5	5	3	4
20-30	Female	Operadora de loja	Purple	4	4	3	4	4	4	3	4	3	4	3	5	4	4	4	4	3	3
20-30	Female	Músico freelancer	Purple	5	5	5	5	4	5	4	5	5	5	3	5	3	5	5	5	3	4
20-30	Female	Graphic Designer	Purple	4	3	5	4	3	3	4	5	2	4	2	4	2	5	5	5	4	4
20-30	Male	Student	Grey	5	4	5	3	4	4	2	3	4	4	1	2	1	5	5	5	5	5
20-30	Female	Sales assistant	Blue	5	2	5	5	5	4	4	3	5	5	4	4	1	5	4	5	3	2
20-30	Female	Nurse	Purple	4	5	5	5	4	5	5	5	5	5	4	5	5	5	4	5	3	5
41 to 50	Male	Comercial	Blue	5	4	4	4	3	5	4	3	3	5	2	3	3	5	5	5	3	4
20-30	Female	Student	Purple	4	4	4	3	4	4	3	4	3	4	3	3	3	4	3	4	3	2
20-30	Male	Strategy analyst	Black	5	5	5	5	5	5	5	5	2	5	1	1	1	5	5	5	3	3
20-30	Female	Student	Red	5	4	5	5	4	4	4	5	4	5	3	4	3	5	5	5	3	2
20-30	Male	Real estate agent	Grey	5	5	5	5	4	4	4	5	3	4	2	3	3	5	4	4	3	4
20-30	Male	Sales Assistant TIFFOS	Red	4	4	5	3	4	3	2	4	2	4	1	2	2	5	4	4	3	2
20-30	Female	Student	Green	5	4	5	4	4	4	3	4	4	5	3	3	3	5	5	5	4	3
20-30	Male	Student	Blue	3	4	3	5	4	4	2	2	4	4	4	4	4	5	4	5	3	3
20-30	Female	Student	Blue	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5
20-30	Female	Estudante	Blue	4	5	4	2	3	4	2	4	4	4	2	2	2	4	4	4	4	4
20-30	Male	Costumer service operat	Green	5	5	3	4	2	3	4	5	4	4	4	4	2	5	4	5	3	3
20-30	Female	Graphic Designer	Green	5	5	5	5	5	5	4	4	4	5	3	3	4	5	5	5	4	3
Less than 20	Female	student	Blue	5	4	4	5	5	3	4	5	4	5	2	3	4	5	5	5	5	5
20-30	Male	Soldier	Black	3	4	4	3	3	2	2	3	2	3	1	2	2	4	4	4	3	3
31 to 40	Male	Engenheiro mecânico	Orange	4	5	5	4	4	4	3	4	3	4	2	3	2	4	3	3	3	3
20-30	Male	marketer	Black	4	5	4	3	3	4	2	5	5	4	3	4	2	5	5	4	5	4
20-30	Female	Student and worker	Blue	5	4	5	4	5	3	4	4	4	5	4	3	3	5	4	5	4	3
20-30	Male	Software Developer	Orange	5	5	5	4	4	3	4	4	2	4	2	2	2	5	5	5	2	3
31 to 40	Female	Empresária	Green	5	5	5	5	5	5	5	2	5	5	3	3	3	5	5	5	5	5
20-30	Female	Estagiária	Yellow	5	5	5	5	4	5	3	5	1	5	5	4	4	5	4	5	4	3
20-30	Female	Finance	Blue	4	5	3	4	5	2	4	4	2	4	2	3	2	5	5	5	3	2
20-30	Male	Student	Orange	5	5	4	5	3	4	5	5	4	4	3	2	3	5	5	5	4	3
20-30	Male	Student	Green	5	3	5	4	3	4	3	5	5	5	2	3	3	5	5	5	4	2
Less than 20	Male	Student	White	4	5	5	4	4	5	3	4	4	4	1	1	1	4	5	5	3	1
20-30	Male	Student	Blue	5	5	4	3	3	4	4	3	1	3	1	2	1	5	4	4	3	2
20-30	Male	Trabalhador Independe	White	3	3	2	3	3	3	1	2	4	2	4	3	1	4	4	4	3	4
20-30	Female	Office manager	Purple	5	4	5	5	3	5	5	4	5	5	2	4	3	5	5	5	3	4
20-30	Female	Student	Green	5	5	5	5	5	5	3	4	4	5	5	5	5	5	5	5	5	5
20-30	Male	Student	Black	4	4	5	3	3	3	3	4	4	3	1	2	1	4	4	4	3	3
20-30	Female	Student Worker	Yellow	5	5	5	5	5	5	5	5	5	5	1	5	1	5	5	5	3	1
20-30	Male	Student	Black	4	4	5	3	2	4	3	2	1	1	1	1	1	4	4	4	2	1
20-30	Male	Commercial Assistant	Green	3	2	5	3	2	3	2	3	1	3	1	4	1	5	4	3	2	2
20-30	Female	Jurista	Red	5	3	4	5	5	5	4	5	2	5	3	4	3	5	5	5	4	3
20-30	Female	Student	White	5	5	3	4	4	4	5	5	4	5	4	4	3	4	4	4	2	4
20-30	Female	Student	Blue	4	4	3	4	4	4	4	4	4	4	4	4	4	5	4	4	5	4
20-30	Male	Eletricista	Black	3	3	4	5	3	4	2	2	3	4	2	1	1	4	3	4	3	3
20-30	Female	Student	Blue	4	5	4	4	5	4	4	4	3	4	3	2	2	5	5	5	5	5
20-30	Female	Consultora de Comunici	Orange	5	4	4	4	4	4	5	5	2	4	4	3	3	4	4	5	4	4
20-30	Female	Student	Black	5	4	5	3	4	5	3	3	4	5	1	4	1	5	5	5	2	1
31 to 40	Male	Engineer	Blue	4	4	4	2	3	4	4	4	4	4	2	2	2	4	4	4	3	2
20-30	Female	Student	Red	4	5	5	5	5	4	4	5	3	5	3	4	3	5	4	4	4	3
20-30	Female	Costumer delight for Fas	Blue	5	5	5	5	2	3	3	4	4	4	3	2	1	3	3	3	2	4
20-30	Female	Software developer	Red	5	4	5	4	4	4	4	4	3	4	1	1	1	5	5	3	4	2
31 to 40	Female	Educadora de infância	Red	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3
31 to 40	Female	Gestora de Operações	Black	3	3	3	5	3	5	4	5	2	4	5	3	2	5	4	4	2	3
More than 60	Male	Truck driver	Blue	5	5	5	5	5	5	5	2	5	5	1	3	2	5	3	5	1	1
31 to 40	Female	HR Manager	Black	5	4	5	4	4	4	5	5	4	4	3	3	2	5	5	5	3	2
51 to 60	Female	Contabilista	Blue	3	4	4	5	5	3	5	5	5	4	2	2	1	4	4	4	4	2
31 to 40	Male	Contabilista	Green	3	3	4	3	3	4	4	4	2	3	2	2	1	3	3	3	2	3
31 to 40	Female	Accounting assistant	Black	5	5	5	5	5	5	3	4	4	3	1	1	1	5	5	5	1	3
20-30	Male	Fonctionnaire	Black	5	2	5	3	2	2	3	3	2	4	1	1	1	5	5	5	2	2
20-30	Female	Student	Purple	5	3	3	4	4	4	3	4	5	3	4	4	4	4	4	4	4	4
20-30	Female	Sales assistant/Student	Blue	4	4	5	5	5	4	3	5	3	3	3	3	4	5	3	5	5	1
20-30	Female	Sales assistant/Student	Blue	4	4	5	5	5	4	3	5	3	3	3	3	4	5	3	5	5	1
Less than 20	Female	Estudante	Green	4	5	4	4	4	4	2	2	5	4	2	4	4	4	4	5	5	4
20-30	Female	Process Engineer	Yellow	5	2	4	4	4	5	4	4	3	4	1	3	3	5	4	4	2	2
20-30	Female	Trabalhador por conta c	Blue	5	3	4	4	4	4	3	4	3	3	4	3	3	5	5	5	4	2
20-30	Female	Student	Black	5	4	5	5	4	5	3	3	4	5	2	4	1	4	4	3	4	4
20-30	Female	Student	Blue	5	5	5	4	5	5	4	4	5	5	3	5	3	5	4	4	4	4
20-30	Male	Financial services	Green	4	5	4	3	3	3	4	4	2	4	2	2	2	4	4	4	2	2
51 to 60	Male	Seller	Black	4	5	4	5	5	4	3	3	4	4	5	3	3	4	4	5	5	4
Less than 20	Female	Student	Blue	4	5	4	4	4	4	3	3	3	4	2	2	2	5	4	4	4	4
51 to 60	Female	Contabilista	Green	4	4	4	4	4	4	2	4	4	4	2	2	2	4	4	5	2	2
20-30	Male	IT Project Manager	Black	5	4	5	5	5	4	3	3	4	4	4	3	3	5	5	5	3	3
51 to 60	Male	Professor	Blue	5	5	5	5	3	5	4	4	4	5	3	4	4	5	4	4	5	5
20-30	Female	Accounting	Black	5	4	4	3	3	3	2	4	4	3	2	2	2	3	2	3	3	2
20-30	Female	Student	Yellow	5	4	5	5	5	5	4	3	5	5	3	4	2	5	4	2	2	5
20-30	Female	student and marketing t	Black	4	4	5	4	3	4	3	3	4	5	3	4	3	5	4	4	4	3

Appendice 8 - Data base (cont.)