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Master Thesis

Complete, simpler, or simplest?

Responsive logos and their effects on consumers' reactions to brand logos.

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Abstract

Aimed at making brands recognisable to consumers and at triggering positive responses in them, logos can increase brand loyalty, product consumption or evaluations, key factors to brand performance. Previous literature on logos has focused on logo design and elements, or logo processing but has taken logo changes as independent logo versions. Responsive logos constitute one logo that adapts to screen size configuring different compositions of one logo rather than changes of it. In a 3 (logo completeness: complete vs. simpler vs. simplest) by 2 (nationality) between-subjects experiment, 138 Dutch and 129 Portuguese consumers were exposed to three different logos from three international brands. Processing fluency, processing time, attitude towards the logo, logo recognition and Tolerance of Ambiguity (ToA) were measured. Dutch participants were found to have significantly higher ToA than Portuguese participants, a finding discussed in parallel to Hofstede's Uncertainty Avoidance Index (UAI). Dutch participants showed more negative attitude towards the logo which was explained for 15% by their nationality, regardless of logo version. Simplest logos had a strong detrimental effect on processing fluency and were the least helpful logo variant to identify brands. The trend of logo simplicity as a strategy to communicate across emerging digital platforms is discussed in contrast with the potential for logo oversimplification. Focusing on ToA, the current research therefore adds to the growing body of cross-cultural research which overall reasons that ambiguity should be avoided in brand logos and across all corporate marketing communications.

Keywords: corporate logos, responsive logos, tolerance of ambiguity, cross-cultural research, consumer behaviour

Alongside brand name, a logo is a key identity aspect of a brand and one of its most visible elements. The more unique and memorable a logo is, the higher the chance that consumers will recognise and recall it. Owing to this, it becomes clear why logos, together with brand name, are the least frequently changed elements of an organisation's visual identity (Kohli et al., 2007). Nevertheless, exceptional events e.g. mergers, acquisitions, or takeovers trigger companies to change their logos (Foroudi, Melewar, et al., 2017). Ultimately, a brand opts to change its logo to align its image with its market position while ensuring the brand remains visually appealing.

Following the evolution of corporate communication, new information technologies sparked changes in how brands can interact with consumers (Thøger Christensen & Cornelissen, 2010). In practice, this translated to increased marketing spending, part of which was, and is, allocated to the development of new logos. More than modernising its corporate image, brands also redesign logos to address the increasing need for them to be displayed across an array of mediums. From computers to smartphones or smartwatches, brands currently have numerous devices through which they can target consumers. However, screen sizes influence how content is displayed and if a logo is not displayed properly to consumers, brands risk them not being recognised. This could happen e.g. when a logo that contains details such as shadows or includes several elements such as text, shapes and frames becomes intelligible once displayed in smaller proportions on smaller screens. To address this matter, the trend of responsive logos has emerged (e.g. Maffei, 2019; Mihajlović et al., 2016). A responsive logo is one that "should be able to work across multiple platforms of media and applications" (Gücük, 2016, p. 570). Hence, by developing consistent logo variations that can adapt to screen size, brands using responsive logos can control how it is presented to consumers across the mediums they use (see Figure 1).

More than merely reducing its dimensions, responsive logos actively adapt to screen size and reposition or remove elements within the logo to ensure it remains legible. From the leftmost to the rightmost side of Figure 1 brand logos of Coca-Cola, Channel and Nike illustrate the progression from complete to simpler logos while maintaining the brands' visual identity. By developing and using responsive logos a brand thus can ensure its image remains consistent across a wider range of platforms and devices. With such consistency, companies can prevent brand misrecognition when targeting consumers. If different logos can influence consumers' responses to them, it is possible that when seeing different variations of a corporate logo pertaining to the same brand, consumers' responses will also vary. This, in turn, hints that consumers' reactions to a responsive brand logo could depend on the variant of the logo they

Figure 1

Responsive Logos for Coca-Cola, Chanel and Nike (adapted from Gücük, 2016)
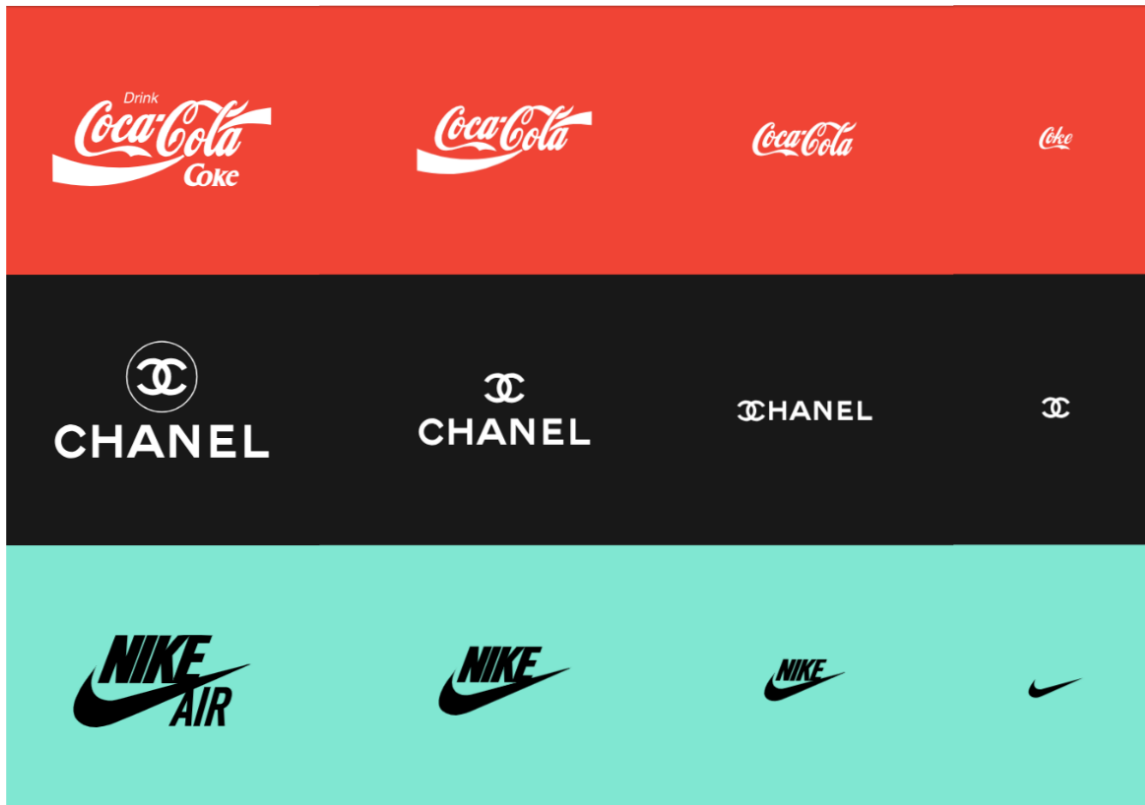
see. Surprisingly, despite the rapid increase in mobile and wearable devices over the last few years, virtually no attention has been given to the topic and such reasoning remains speculative.

Therefore, the current research addresses this gap by investigating consumers' responses to three responsive brand logos from well-established multinational companies and market leaders not only in their sectors but also as companies with marketing practices that should be replicated in the wider industry. Moreover, as members pertaining to different cultures have been shown to respond differently to advertisement types (de Mooij & Hofstede, 2011; Okazaki & Mueller, 2007), logo design characteristics such as elaborateness, naturalness and harmony (van der Lans et al., 2009) or abstract and symbolic logo elements (Woo Jun et al., 2007), a cultural dimension is included in this research. Considering the simplest version of a responsive logos has the potential to be an oversimplified (and thus more ambiguous) variation of the original (and thus more complete) logo, the focus will be on Tolerance of Ambiguity (ToA) in relation to the Uncertainty Avoidance Index (UAI) of Hofstede (1983, 1984, 2001). Deriving from previous literature suggesting that the cultural differences between The Netherlands and Portugal in terms of UAI can lead to differences in consumers' responses to visual stimuli, this research focuses on Dutch and Portuguese consumers' responses to variations of one same corporate logo from international brands. The next sections encompass an overview of logo

elements, purposes, and underlying processing theories as well as a discussion on consumers' responses to logo changes, in general, and across cultures.

Theoretical Background

Logo Objectives, and Elements

Early marketing research confined the definition of corporate identity to a "logo or brand image of a company, and all other visual manifestations of the identity of a company." (Carter, 1982, p. 5). Despite the evolution of such definition to incorporate other non-visual elements e.g. brand structure or corporate mission (see Melewar, 2003), corporate logos remain a pivotal tangible asset that supports the intangible value of an organisation (Park et al., 2013). Logos are used by brands to make themselves recognisable to customers in e.g. advertising, merchandising, products, or stationery. As an embodiment of an organisation's mission and values, logos therefore play an important role in creating a strong brand image (Foroudi et al., 2014; Kaur & Kaur, 2019). Owing to this, designing, and selecting a corporate logo is a complex process that often requires substantial research and financial investments mainly because it can have an impact on corporate reputation (Foroudi, Hafeez, et al., 2017).

Farhana (2012) claimed that "logos are visual icons providing two basic, yet necessary, functions for brands: identification (a marker for finding a specific offering) and differentiation (how to tell that offering apart from others)." (p. 226). This means that brands should select corporate logos with elements and characteristics that make them (and the brand) easily recognisable by consumers while being distinctive to not be confused with other logos (or brands). The guidelines for logo selection proposed by Henderson and Cote (1998) are, to date, taken as a benchmark for logo design and thus are frequently mentioned throughout logo literature. Based on a discussion of which formal aspects are key for a good logo – correct and false recognition, affect, meaning and subjective familiarity – Henderson and Cote (1998) investigated how logos' visual characteristics could affect individuals' responses to logos. For this, the authors developed 195 logos and measured the responses of students and graphical designers across 13 dimensions e.g. proportion, complexity, harmony, or symmetry. Findings from Henderson and Cote (1998), expanded with research from Henderson et al. (2003) revealed *three universal dimensions* for logo design – elaborateness i.e. complexity, naturalness i.e. representative and organic characteristics, and harmony i.e. balance between elements. This led authors to argue that logos should meet three objectives: 1) high-recognition i.e. a logo that is recognised by consumers and triggers positive attitudes; 2) low-investment i.e. a logo that is

falsely recognised by consumers but still triggers positive attitudes; and 3) high image i.e. a logo that has a professionally looking design. Building on the work of Henderson and Cote (1998), other scholars have shown a tendency for consumers to have more positive responses to the dimensions of elaborateness, naturalness and harmony. Such results were consistently found between Asia and the United States (Henderson et al., 2003) and across 10 countries in 3 cultural clusters (Asia, Russia and Western; van der Lans et al., 2009). Taken together, this evidence implies that brands should opt for specific types of logos which, irrespective of being recognised by consumers, achieve the goal of prompting positive attitudes in them.

Even though defining types of logos has been controversial (for a discussion see Kim & Lim, 2019), based on the visual elements of a logo, a stream of research proposes four types of logos: 1) figurative; 2) typographic; 3) abstract; and 4) combination marks (e.g. Airey, 2009; Buttle & Westoby, 2006; Schechter, 1993). As seen on Table 1, figurative logos portray realistic objects, animals or other recognisable elements (penguin); abstract logos depict nonrepresentational elements without a particular meaning attached to them (siren); typographic logos are composed exclusively by textual elements such as brand/product name (Toys R' Us) and combination marks are logos that e.g. encompass figurative and typographic characteristics (coffee beans + text). However, even after opting for one type of logo, brands still need to decide on the individual elements that compose it e.g. colour or shape. Why is Starbucks' logo circular and green and not rectangular and purple? Why does Pittsburgh Penguins' logo contain a golden triangle and not a blue hexagon? Answers to these questions can be found in how logos and their elements are perceived by consumers.

Logo processing

Independently and altogether, the elements that compose a brand logo can enrich brand image by prompting associations in consumers' minds regarding e.g. brand personality traits such as excitement or competence (Kaur & Kaur, 2019) or product-brand congruence (Luffarelli et al., 2019). Because of this, brands should design and chose logos aiming towards meaningful and well-defined marketing objectives in an effort to shape the brand's image in consumers' minds (Kohli & Suri, 2002). Recalling Henderson and Cote (1998), the main strategic objective of a logo is to prompt positive attitudes in consumers, ideally towards the product *and* the brand. When such goals are achieved, consumer responses can materialise in benefits for the brand such as increased financial performance (Luffarelli et al., 2019; Park et al., 2013). Widely mentioned in literature, the case of Tropicana's package redesign in 2009 shows how consumers can be sensitive to a brand's image and how that can translate into a negative effect for the

Table 1

Examples of figurative (Pittsburgh Penguins), abstract (Starbucks), typographic (Toys R' Us), and combination mark (figurative + typographic; Costa Coffee) logos (adapted from Luffarelli et al., 2019)

Type of logo	Visual representation
Figurative	
Abstract	
Typographic	
Combination mark (e.g. figurative + typographic)	

brand. Under a $35 million investment, Tropicana adopted new graphics and layout for their orange juice packaging, a process which included the brand logo replacement by the brand name in unbranded text. After the change, consumers could not attribute the new design to Tropicana, nor could they recognise the brand. This, in turn, led to an estimated loss of $27 million in sales (Lee et al., 2010). So, more than assessing the effects of logo design on consumers, it is relevant to investigate which factors influence their judgements of logos given the threats or opportunities such factors can pose to a brand's performance, financially and otherwise.

In logo and marketing literature, the *mere exposure effect* has long been linked to attitudinal effects (e.g. Fang et al., 2007; Zajonc, 1968). The rationale behind the concept is that

repeated exposure to a neutral stimulus eventually induces positive responses towards it. Based on this principle, Tropicana's redesign failure presented above can thus be explained by consumers not having been previously exposed to the new design. The *mere exposure effect* can also account for why brands generally carry out significant efforts to consistently display their logo across corporate communications: to increase consumers' familiarity with the logo and consequently increase the likelihood of prompting positive attitudinal behaviour in them. Brands' attention to communicate consistently is therefore grounded on the premise that although familiarity with logos is difficult to attain, achieving it benefits brands by improving consumers' efficiency when searching for logos as well as improving the time necessary to carry out the search (Qin et al., 2014). This implies that a faster recall of known logos (or brands) helps consumers to carry out their purchase-decision process more rapidly by making those logos (or brands) more salient in their minds. However promising this may be for sales growth, recent developments in literature call for caution in the interpretation of the *mere exposure effect*. In his study, Walsh et al. (2010) manipulated Adidas and New Balance logos with none, moderate and considerable degrees of change and found that as the logos suffered more changes, weakly brand-committed consumers reported more positive brand attitude. Sääksjärvi et al. (2015) presented consumers with the McDonald's logo as well as colour and angle variations of it and found not only that consumers processed either type of stimuli in the same way but also that either logo type was effective in adding to brand prominence and freshness. Overall, these studies suggest that the repeated exposure to visual stimuli only justifies part of variations in consumers' responses to corporate logos (Inoue et al., 2018).

Whilst repeated exposure to one same visual stimuli can improve familiarity with it, an aspect equally important to grasp consumers' reactions to logos is *how* they process such stimuli. Owing to this, the concept of processing fluency emerged. Connecting the *mere exposure effect* with individuals' learning and satiation (Two-Factor Theory; see Berlyne, 1970) as well as sensitisation and habituation (Dual-Process Theory; see Groves & Thompson, 1970), Janiszewski and Meyvis (2001) gave a meaningful contribution to the comprehension of processing fluency. The authors found that logos with a single meaning i.e. logos that are simpler can be favoured over logos with multiple meanings i.e. logos that are more complex. One could argue that results could be explained by differences in logo complexity but, in fact, they are connected to how consumers encode, process, and decode the information a logo contains. To be more precise, this concerns two distinct types of processing fluency: perceptual and conceptual fluency. Either type of processing fluency has roots on the fact that individuals' processing fluency pertains to the stimuli representations they create to facilitate encoding and

processing of that same stimuli upon a future exposure. However, when individuals experience perceptual fluency, they create mental representations of stimuli based on its attributes and when they experience conceptual fluency, they create a mental representation of a stimulus based on its meaning. So, effortless processing fluency can be expected to assist consumers' in their processing of visual stimuli e.g. ads, flyers or outdoors by facilitating the recall of stimuli to which they were previously exposed.

Indeed, self-reported processing fluency can be a predictor not only of attitude towards ads and towards brands but also of purchase intention (Storme et al., 2015). Additionally, when consumers experience low processing fluency interpreting a product, they perceive subsequent products as easier to process and, therefore, have more positive attitudes towards them (Shen et al., 2010). Apart from this, Wänke and Hansen (2015) contended that more than absolute processing fluency i.e. the overall processing fluency experienced when processing stimuli, the relative processing fluency i.e. the processing fluency experienced vs. the one that was expected can have an effect on consumers' attitudes. In short, it appears that, beyond repeatedly exposing consumers to a logo, brands should prioritise logos that entail lower processing fluency. By doing so, brands can provide consumers with logos that are not only easier to process but that also minimise the risk of exceeding their expectations regarding how easy the logo processing is anticipated to be. All in all, literature seems to indicate that a corporate logo should entail low processing fluency to be interpreted, be repeatedly presented to consumers, and remain unchanged throughout time to effectively trigger positive responses in consumers both towards the logo and the brand. But do these principles still hold in case of a logo change?

Logo changes and responsive logos

As one might expect, aside from having more positive (or negative) responses to one brand logo over another, consumers' attitudes towards the logo and the brand can also be affected by changes to the same brand logo. Following a series of interviews to deepen their understanding of how logo changes are processed, Peterson et al. (2015) carried out a survey to investigate the responses of 406 under- and post-graduate students to logo changes of two retail brands. The authors concluded that while consumers' doubts about a logo change can trigger negative responses, their interest in the change may elicit positive responses. This can be potentially accounted for by the fact that "aesthetic judgments initiated by novelty in product appearances are found to be dynamic" (Mugge et al., 2017, p. 313). However, van Grinsven and Das (2016) found that even though large logo changes can be more interesting to most consumers – and thus result in more positive attitudes towards them –, repeated exposure of large logo changes

to high brand conscious consumers can evoke negative responses. Yet, as straightforward as the relationship between logo changes and consumer responses may seem, it can also be absent (Müller et al., 2013). Perhaps because of such contradictory results linking logo change and consumers' responses to it, guidelines for changing logos are inconsistent and scholars e.g. Walsh et al. (2018) propose a conservative approach in which "logo redesign may be best done incrementally" (p. 372). Nevertheless, changing a logo assumes the departure logo adequately performs the functions for which it was designed in the first place. Designer Paul Rand laid out seven principles of effective logo design: simplicity, memorability, timelessness, adaptability, universality, distinctiveness, and visibility (Rand, 1988, 1994). Then, to prevent the necessity of changing a logo, brands should choose one that can withstand time while being flexible enough to facilitate adaptation across multiple mediums. It was with this reasoning in mind that brands began to allocate resources to the digitalisation of their marketing strategies, rebranding their logos into flattened and more web-friendly designs. As can be seen on Figure 2, more than revolutionary changes (such as with the Juventus logo), logo digitalisation mostly entails evolutionary changes connected to the conversion of logo characteristics e.g. illuminance, depth, or contours to a two-dimensional plane (hence the terminology "flat"), improving legibility across digital platforms. This approach is part of the adjustments in marketing communication practices which eventually also sparked the trend of responsive logos (Mort & Drennan, 2002).

Responsive logos are a smaller unit within responsive web design, a field which "aims to provide methods for adapting the webpage content for viewing and seamless user experience

Figure 2

Older Logos (at the top) and Newer and Improved Logos for Digital Platforms (at the bottom) for Volkswagen, Pepsi, Juventus, and Movistar (adapted from Manas-Viniegra et al., 2020)

transition with minimum resizing, panning and scrolling, across a wide range of devices" (Mihajlović et al., 2016, p. 50). For logos, typically visible in brands' digital communications e.g. webpages or mobile apps, this means they have the versatility to adapt to screen size, a process resulting in different gradations of one same logo which remain recognisable and legible regardless of the screen in which they are presented. Though the emergence of responsive logos is difficult to pinpoint, Maffei (2019) has indicated 2001 as the year in which responsive logos first surfaced via two individuals who produced a logo for a blog. That logo, although not responsive in its nature, "was generated 'on the fly' whenever viewed, depending on the last four IP addresses of the website visitor" (Rhizone, 2001 as cited in Maffei, 2019, p. 46). Two decades have passed since 2001 but the topic has received little attention and literature on the subject remains scant. It could be argued that this is the case because responsive logos are not considered a market-relevant practice; still, recent developments in the field suggest otherwise.

Because "Without versatility of form, the logo suffers, as it loses out on a great amount of exposure" (Gücük, 2016, p. 570), investigating responsive logos is crucial to assist brands in the development of design strategies towards crafting more effective responsive logos, an element that conveys not only a brands' responsiveness to media but that also points toward a brand that pays attention to its consumers (Maffei, 2019). Theoretically, by exploring to what extend different gradations of one same logo interfere with its marketing goal of prompting positive attitudes in consumers a contribution is made to the literature on processing fluency and on the *mere exposure effect*. As simpler logos, a trend in recent years, have e.g. the potential to increase product consumption (Bossel et al., 2019), understanding how consumers react to responsive logos also adds to the stream of research focused on guiding principles for effective logo simplification (Adîr et al., 2014; Chen et al., 2015).

Attitudes towards the logo, uncertainty avoidance and tolerance of ambiguity
As logos are how an organisation can be recognised by its international audiences, simplifying logos may be perceived differently across countries which is why cross-cultural research on logos is well established (e.g. de Mooij & Hofstede, 2011; Okazaki & Mueller, 2007). Cultures vary on their norms, beliefs and values which ultimately impacts how individuals perceive and process the environment that surrounds them. In terms of logos, literature illustrates how consumers' perceptions of logos and logo elements can be affected by cultural values. Upon investigating colour meanings and preferences across eight countries in East Asia, Europe and North and South Americas, Madden et al. (2018) uncovered that even though blue, green, red,

black, and white were equally liked in all countries analysed, consumers from different countries reported different meanings for red and black. Using 501 brand logos in five studies, Gupta et al. (2021) found that within the US, contrasting tightness vs. loose cultural values can moderate the effect of logo design on brand attitude across consumers from different states. Adding to these striking findings – especially those within the same country – culture has also been found to account for variations in consumers' aesthetic preferences (Jun et al., 2008; Kilic et al., 2011). Including cross-cultural variables in logo research is therefore essential for brands because logos' aesthetic appeal has been linked to brand performance (Park et al., 2013).

Grounded in the cultural dimensions of Hofstede (1983, 1984, 2001), marketing literature has examined the role of culture on consumer behaviour e.g. by investigating the influence of power distance[1] on consumers' preference for national vs. private-label brands (Wang et al., 2020) or by uncovering that indulgence[2] can increase online shopping expenditure (Yýldýrým et al., 2016). However, and in particular within logo research, the UAI dimension, defined as "the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity" (Hofstede, 1984, p. 83) seems to have been underexplored. Therefore, grasping the role of UAI in the context of potentially overly simplified responsive logos can help to fill this gap because ambiguity is not desired neither in logos nor in brands' overall marketing communications (Hagtvedt, 2011). In fact, on their meta-review of 43 articles on the persuasive impact of anthropomorphic appeals, i.e. appeals that attribute "humanlike properties, characteristics, or mental states to real or imagined nonhuman agents and objects" (Epley et al., 2007, p. 865), Velasco et al. (2021) found consumers with high UAI[3] displayed more positive product evaluations under such stimuli when compared to non-anthropomorphic appeals. Results may be bound to anthropomorphic appeals but there appears to be plausible reason to believe UAI is a factor weighing on consumers' perceptions of and attitudes towards logos.

Despite the salience of Hofstede's cultural dimensions for cross-cultural international marketing research they are controversial and a stream of research has expanded or altogether changed dimensions (for a discussion see de Mooij, 2017) as is the vase with UAI. Throughout literature, this construct has been used interchangeably with tolerance of ambiguity (ToA; e.g. Stewart Jr et al., 2003) and used as a proxy for it (e.g. Madzar, 2005). When comparing

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[1] Hofstede defines power distance as "the extent to which the members of a society accept that power in institutions and organizations is distributed unequally." (Hofstede, 1984, p. 83).

[2] Cultural indulgence vs. restraint is "the gratification versus control of basic human desires related to enjoying life." (Hofstede, 2011, p. 8)

[3] The authors used Hofstede's UAI scores for Austria, Canada, China, France, Germany, Hong Kong, Indonesia, The Netherlands, Singapore, South Korea, Spain, Switzerland, United Kingdom and USA.

concepts, Grenier et al. (2005) stated a "time-oriented distinction confers the unique dimension of the present to IA [intolerance of ambiguity], and the unique dimension of the future to IU [intolerance of uncertainty]" (p. 596). For logo research such reasoning therefore implies that ToA is a more adequate dimension to address in cross-cultural studies because it captures context-specific aspects. In line with this, van Hooft et al. (2013) added ToA as a variable to their study on visual metaphors although the authors did not find ToA dimension to affect consumer behaviours which could be justified by the approximate scores in Hofstede's UAI of the countries examined i.e. Netherlands(53), Germany(65) France(86) and Spain(86). Such justification gathers support from different responses to natural logos linked to UAI in the Netherlands, Spain, and Portugal (104; Machado et al., 2015; Torres et al., 2019). Ultimately, it seems that when exploring cultural dimensions, specifically UAI or ToA, as responsible for variations in consumers responses to logos, concentrating efforts on countries with higher discrepancy in Hofstede's UAI scores might uncover differences not detectable when comparing countries with more approximate scores. For this reason, focusing specifically on The Netherlands and Portugal to examine the effects of responsive logos on consumers from different nationalities seems to be a suitable approach given Hofstede indicates the latter has a score in UAI almost two times that of the first.

Current Research

Considering the interplay between logo changes, logo recognition and attitudinal responses, this research aims to investigate how responsive logos from international brands affect the perceptions of consumers from two distinct countries in terms of Hofstede's UAI. Based on the generalised trend towards logo simplification discussed above, brands may therefore develop gradations for their responsive logo that, based in an already-simplified logo, might pose an increased risk of excessive ambiguity and misrecognition. Even though to be incorrectly recognised is also an objective of logos, correct recognition is still important for brands. With literature lacking on responsive logos, understanding how logo recognition is affected by logo responsiveness is key to know whether using a responsive logo will contribute to correct or incorrect logo recognition. As a result, the following research question is formulated:

RQ1: How do different gradations of logo responsiveness affect consumers' logo recognition?

The literature reviewed indicates processing fluency influences consumers' judgments of visual stimuli. Hence, consumers may experience differences in processing fluency when

exposed to one version of a responsive logo instead of another. This is because when presented with simpler logos, consumers can spend more time trying to obtain full comprehension of it due to ambiguous or missing elements, differences which may be influenced by their nationality i.e. cultural background. Owing to this, a second research question is articulated:

RQ2: To what extend do different gradations of logo responsiveness affect consumers' logo processing fluency?

In terms of responsive logos and recalling Table 1, the logos that configure the simplest version of the original and more complete logo can e.g. be reduced to a single icon. This simplification is expected to be detrimental to consumers' processing fluency due to the absence of logo elements to which consumers have been accustomed. It therefore appears that, based on the variant of a responsive logo, consumers may experience variations in their processing fluency, with complete logo versions presumably being processed more easily and simpler versions being more difficult to decode. This reasoning has led to the following hypothesis:

H1: Consumers will experience a higher processing fluency in the complete logo condition than consumers in the simplest logo condition.

Lastly, responsive logos risk oversimplification in their simplest variants, to the point of becoming ambiguous. Since such ambiguity is assumed to be detrimental to consumers' logo recognition and processing fluency, differences in consumers' attitudes towards logos are anticipated. Hence, and based on the UAI differences between Portugal and The Netherlands (cf. Hofstede, 1983, 1984, 2001), there is the possibility that consumers from these two countries will react differently to the variants a responsive logo. This is expressed in a third research question:

RQ3: What is the effect of different gradations of logo responsiveness on Dutch and Portuguese consumers' attitude towards the logo?

Because of Dutch and Portuguese consumers' presumed differences in Hofstede's UAI, it is also anticipated that individuals from either country manifest contrasting scores in ToA. So, simplest logo gradations of a responsive logo, due to simplification and missing elements, are potentially more ambiguous than other, more complete gradations. Drawing from the

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cultural differences between The Netherlands and Portugal, individuals from the latter country should report more negative attitudes towards simpler and more ambiguous responsive logo gradations and individuals from the first are anticipated to manifest more positive attitudes. This reasoning has led to a second and third hypothesis:

H2: Dutch consumers will report a more positive attitude towards the simplest logo when compared to Portuguese consumers.

H3: Portuguese consumers will report a more positive attitude towards the complete logo when compared to Dutch consumers.

The relevance of this study is twofold: 1) it adds to the underdeveloped field of responsive logos as a design trend that is drawing more attention from scholar while gradually penetrating marketing practices; and 2) it answers to the calls for logo research integrating cross-cultural dimensions. Combining these two aspects makes this virtually the first study to investigate responsive logos with a cross-cultural component. For practice, results can assist brand managers in attaining a deeper understanding of how responsive logos can affect their brand image across different countries with distinct cultural values. Based on that, the present study can also provide orienting principles for designing responsive logos in the future.

Method

Materials

For the development of experimental stimuli, logos from three international brands were selected provided the corresponding brands: 1) integrated the list of world's most admired companies by Fortune (2021) as an indicator of their global status and stakeholder recognition; 2) operate both in the Netherlands and in Portugal ensuring consumers from either countries have been exposed to the brands and their products; and 3) had responsive logos readily available. Brands that met all three criteria were the Walt Disney Company i.e. Disney, Levi Strauss i.e. Levi's and Diageo i.e. Guinness. In addition, chosen brands represented three distinct product categories (Disney for entertainment, Levi's for fashion and Guinness for alcoholic beverages) and three different types of logos in their simplest variation: abstract (Levi's with its icon), figurative (Guinness with its unique harp) and typographic (Disney with its iconic typeface "D"; see Table 2). Considering the scarce literature on responsive logos,

guidelines for their design are, to the knowledge of the researcher, yet to be established. Therefore, choosing logos from the above-mentioned brands contributes to the generalisability of results by aggregating different types of responsive logos, from different brands, pertaining to different product categories.

Stimuli can be seen in Table 2 and were adapted from an existing scalable logo project (see Harrison, 2014). Logos had identical dimensions and proportions and were all inserted in square with a background colour fitting to each company's visual identity surrounded by an unbranded smartphone frame (see Figure 3). Using Adobe Photoshop CS6, nine additional brand logos were created for the logo recognition task. Identical in every aspect to the original brand logos, such logos only differed in colour values which were inverted (see Appendix A).

Table 2

Distribution of Stimuli Across Nationality and Logo Completeness Conditions

Nationality	Logo Completeness		
	Complete	Simpler	Simplest
Dutch or Portuguese			

A manipulation check for logo completeness was implemented and operationalised by asking participants "How would you classify the three logos you just saw?" and the options "the three logos are full, complete and recognisable representation of the original logos", "the three logos are a fairly incomplete but reasonably recognisable representation of the original logos", and "the three logos are a very concise or very simple and less recognisable representation of the original logos". A chi-square test showed a significant relation between manipulation check and logo completeness conditions ($\chi^2(2) = 72.82$, $p < .001$). Overall, participants correctly

Figure 3

Simplest Levi's Logo as an Example of how Stimuli were Presented to Participants
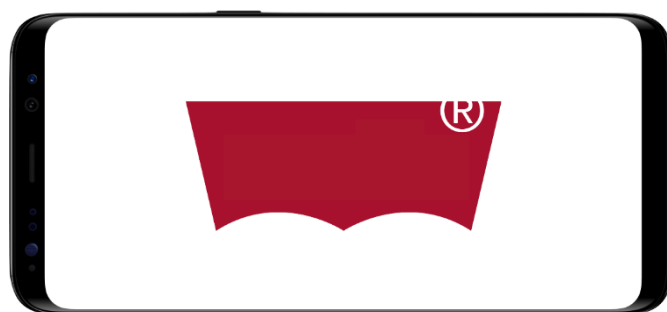
identified logos in the complete condition significantly more than in the simpler and simplest conditions (see Table 3). This was also the case within the Dutch ($\chi^2(2) = 46.15$, $p < .001$) and Portuguese samples ($\chi^2(2) = 29.22$, $p < .001$; see Table 3). Dutch participants correctly identified logos in the complete condition more than Portuguese participants ($\chi^2(1) = 7.31$, $p = .007$; see Table 3) but no significant differences were found across nationalities in the simpler ($\chi^2(1) = 0.06$, $p = .801$) or simplest conditions ($\chi^2(1) = 0.74$, $p = .389$; see Table 3). No significant relation between manipulation check and nationality was found ($\chi^2(1) = 3.79$, $p = .052$).

Table 3

Count and percentages of correct and incorrect answers across nationality.

Logo Completeness		Nationality		Total
		Dutch	Portuguese	
Complete logo	Correct count (%)	37(88%)$_{a, 1}$	27(63%)$_{b, 1}$	64(75%)$_1$
	Incorrect count (%)	5(12%)$_{a, 1}$	16(37%)$_{b, 1}$	21(25%)$_1$
	Total count (%)	42(49%)	43(51%)	85(100%)
Simpler logo	Correct count (%)	20(45%)$_{a, 2}$	21(43%)$_{a, 2}$	41(44%)$_2$
	Incorrect count (%)	24(55%)$_{a, 2}$	28(57%)$_{a, 2}$	52(56%)$_2$
	Total count (%)	44(47%)	49(53%)	93(100%)
Simplest logo	Correct count (%)	6(14%)$_{a, 3}$	4(9%)$_{a, 3}$	10(11%)$_3$
	Incorrect count (%)	36(86%)$_{a, 3}$	43(91%)$_{a, 3}$	79(89%)$_3$
	Total count (%)	42(48%)	47(52%)	89(100%)

Note: Each subscript letter(number) denotes a subset of nationality categories(logo completeness condition) whose column (same-title-row) proportions do not differ significantly from each other at the .05 level.

As it can be safely assumed that the simpler logos become, the less elements they contain

and therefore the more difficult they become to interpret and identify, the significant differences in the proportions of correct experimental condition identification with a decrease from complete to simplest conditions indicates that the manipulation of degrees of logo completeness was effective.

Participants

From a total of 427 individuals who accessed the questionnaire, 298 submitted complete answers (70% response rate) but three cases were eliminated for not meeting the nationality criteria to be included in this research. A preliminary analysis on the remaining 295 cases showed a wide range of questionnaire completion time (from ca. 3 minutes to ca. 27 hours with a standard deviation of ca. 2 hours). To ensure data quality in the timing items throughout the questionnaire, 5% of cases (2.5% lower bound and 2.5% upper bound of questionnaire completion time; $n = 14$) were excluded from analysis. Similarly, outliers in logo processing time were also excluded through interquartile range analysis (Dutch $n = 7$; Portuguese $n = 7$). The minimum of 42 participants in any given condition strengthens potential conclusions from results (cf. Geuens & De Pelsmacker, 2017).

A total of 267 participants were included in the study (see Table 4). A chi-square test showed no significant difference in distribution of participants across nationality and logo completeness condition ($\chi^2(2) = 0.108$, $p = .947$; see Table 4). In terms of gender, 64% of Dutch participants and 68% of Portuguese participants were men and distribution was homogenous across nationality ($\chi^2(1) = 0.55$, $p = .460$) and logo completeness conditions ($\chi^2(2) = 0.08$, $p = .962$; see Table 5). Participants' age ranged from 18 to 78 years old (Dutch range from 19 to 78 years old; Portuguese range from 18 to 71 years old; see Table 5).

Table 4

Total and Partial n and Percentages of Participants' Distribution per Logo Completeness and Nationality Conditions Including Chi-square Results with Column and Row Proportions.

Nationality	Logo Completeness			Total n (%)
	Complete n (%)	Simpler n (%)	Simplest n (%)	
Dutch	42 (49%)$_{a,1}$	44 (47%)$_{a,1}$	42 (47%)$_{a,1}$	128 (48%)
Portuguese	43 (51%)$_{a,1}$	49 (53%)$_{a,1}$	47 (53%)$_{a,1}$	139 (52%)
Total	85(100%)	93 (100%)	89 (100%)	267 (100%)

Note: Each subscript letter(number) denotes a subset of condition categories whose column(row) proportions do not differ significantly from each other at the .05 level.

A series of one-way ANOVAs showed Dutch participants were significantly younger than Portuguese participants (F (2, 259.01) = 63.73, $p < .001$; see Table 5)[4] but no significant difference in age was found across logo completeness conditions (F (2, 175.07) = 1.44, $p = .240$).[5]

Table 5

Means and Standard Deviations for Participants' Age and Questionnaire Completion Time with Participants' Gender and Highest Completed Education Distribution.

Variable	Nationality		Logo Completeness			Total
	Dutch	Portuguese	Complete	Simpler	Simplest	
Duration in	7.95*	12.83*	9.48	9.69	12.29	10.49
minutes $M(SD)$	(10.62)	(15.01)	(6.07)	(13.51)	(17.43)	(13.30)
Age $M(SD)$	27.75**	39.29**	33.68	34.90	31.66	33.70
	(10.38)	(13.16)	(13.18)	(14.27)	(11.80)	(13.08)
Gender count (%)						
Female	46(36%)$_a$	44(32%)$_a$	29(34%)$_a$	32(34%)$_a$	29(33%)$_a$	90(34%)
Male	82(64%)$_a$	95(68%)$_a$	56(66%)$_a$	61(66%)$_a$	60(67%)$_a$	177(66%)
Total	128(100%)	139(100%)	85(100%)	93(100%)	89(100%)	267(100%)
Education count (%)						
High School	11(8%)$_a$	23(16%)$_a$	13(15%)$_a$	1314%)$_a$	8(9%)$_a$	34(13%)
Professional School	6(5%)$_a$	8(6%)$_a$	2(2%)$_a$	6(7%)$_a$	6(7%)$_a$	14(5%)
Higher education	111(87%)$_a$	108(78%)$_a$	70 (82%)$_a$	74(80%)$_a$	75(84%)$_a$	219(82%)
Bachelor	46(36%)$_a$	68(49%)$_b$	40(47%)$_a$	38(41%)$_a$	36(40%)$_a$	114(43%)
Master	57(45%)$_a$	38(27%)$_b$	29(34%)$_a$	32(34%)$_a$	34(38%)$_a$	95(35%)
Doctorate	8(6%)$_a$	2(2%)$_b$	1(1%)$_a$	4(4%)$_a$	5(6%)$_a$	10(4%)

Note: Each subscript letter denotes a subset of condition categories whose column proportions do not differ significantly from each other at the .05 level.
* Mean differences between columns at $p < .05$.
** Mean differences between columns at $p < .001$.

Highest completed education of participants ranged from high school to doctorate degree and was homogeneously distributed across logo completeness conditions ($\chi^2(8) = 6.75$, $p = .564$). However, there were significantly less Dutch participants with bachelor's degree and

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[4] Welch F-test is reported due to a significant Levene's test (F (1, 265) = 25, $p < .001$).
[5] Welch F-test is reported due to a significant Levene's test (F (2, 264) = 3.11, $p = .046$).

significantly more Dutch than Portuguese participants who had master's and doctorate degrees ($\chi^2(4) = 15.74$, $p = .003$; see Table 5). Such difference was deemed negligible given that education was homogeneously distributed across logo completeness conditions ($\chi^2(4) = 3.65$, $p = .456$) and nationality ($\chi^2(2) = 4.12$, $p = .128$) once education was grouped in levels i.e. high school, professional school, and higher education (see Table 5). Almost half of Dutch participants had a master's degree and almost half of Portuguese participants had a bachelor's degree (see Table 5). Overall, most of Dutch and Portuguese participants had completed some higher education (see Table 5). So, the distribution of participants' gender and highest completed education across conditions was homogenous but the distribution of age was not, leading to its inclusion as a covariate in further statistical tests.

Design

This experiment had a 3 (logo completeness: complete vs. simpler vs. simplest) by 2 (nationality: Dutch vs. Portuguese) between subjects factorial design. Contrary to what the levels of logo completeness may hint, they refer to different compositions of the same core elements and not downsized or incomplete logos. In other words, the complete logos have elements that are currently used by the respective brands and would be best displayed in devices with larger screens e.g. Smart TV or desktop whereas the simple(simplest) logos were developed and would be more appropriate for portable(compact) devices e.g. laptop or tablet(e.g. smartphone or smartwatch). Though stimuli consisted of brand logos, brands are not under analysis but rather the logos, as standalone elements. Hence, data from the three logos was combined in a single unit representing each experimental logo condition.

Instruments

Across 24 countries, using English as a questionnaire language has been shown to suppress cultural differences (Harzing, 2005). To prevent this, and thus ensure results can potentially be explained by meaningful cultural differences, after instruments were developed in English, one Portuguese-native Public Relations and Communication bachelor graduate and one Dutch-native International Business Communication Master student translated all instruments into target languages.

Processing fluency, attitude towards the logo and logo recognition were the dependent variables. Participants' logo processing fluency had a double operationalisation: 1) logo processing time; and 2) processing fluency scale. As individual logos were not analysed, the total time spent processing individual logos served as a proxy for total logo processing time per

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logo condition. The processing fluency scale comprised five 7-point Likert scales anchored in the statement "The process of studying the brand logo was…" and the items "difficult - easy", "incomprehensible-comprehensible", "disfluent-fluent", "effortful-effortless", and "unclear-clear" (based on Graf et al., 2018). Overall reliability of the processing fluency scale was good (α = .89; partial $\alpha \geq$ .86). This operationalisation of processing fluency explores potential correlation between processing time and processing fluency scale, given processing time has been used as a proxy for processing fluency in previous literature (van Grinsven & Das, 2016). Attitude towards the logo was operationalised in terms of logo aesthetic appeal and measured with three 7-point semantic differentials (1 = totally do not agree; 7 = totally agree) following the statement "This brand's logo…" and the items: "is aesthetically (visually) pleasing to me"; "provides aesthetic pleasure to me" and "is not aesthetically (visually) appealing to me"[6] (based on Park et al., 2013). The acceptable reliability of the attitude towards the logo scale (α = .74; partial $\alpha \geq$ .77) led to the creation of the compound variable "attitude towards the logo".

Logo recognition was measured with a logo recall task where, in a pool of nine logos (three correct logos, three identical logos with inverted colours, and three logos from other experimental conditions e.g. simpler logo deceivers for the simplest condition), participants had to identify the brand logos they had seen. The percentage of logos correctly recognised was used as a proxy for logo recognition. Logo identification was operationalised through the composite mean of logo identification scale, measured with three 7-point semantic differentials (1 = totally do not agree; 7 = totally agree) following the statement "This brand's logo…" and the items: "attracts my attention."; "helps me identify the brand"; "does not attract my attention"[6] (based on Park et al., 2013). The logo identification scale had an acceptable reliability (α = .74; partial $\alpha \geq$ .71) thus the composite variable "logo identification" was formed.

ToA was measured with the 13-item Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II; based on McLain, 2009) was used given its reliability and validity across different languages such as English (McLain, 2009) Spanish (Arquero & McLain, 2010) and Polish (Lachowska & Ludwikowska, 2017). The MSTAT-II comprises 13 individual statements – e.g. "I don't tolerate ambiguous situations well.", "I prefer familiar situations to new ones" or "I find it hard to make a choice when the outcome is uncertain" – each to be evaluated on a 7-point semantic differential (1 = strongly disagree; 7 = strongly agree disagree"; for the complete items see Appendix B). Reliability of the MSTAT-II scale was good (α = .85; partial $\alpha \geq$ .80) and thus the compound variable "tolerance of ambiguity" was created.

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[6] Item reverse coded.

Procedure

The experiment was conducted through an online questionnaire in Qualtrics (www.qualtrics.com) and data was collected from 5 to 29 of May 2021. Participants were recruited by convenience sampling through acquaintances of the researcher, social media, and mall-intercept technique at Radboud University campus. Upon accessing the questionnaire, participants had to select the questionnaire language (Dutch or Portuguese) after which they were informed about the nature of the research, the data processing policy and predicted questionnaire completion time.

Upon giving consent on voluntary participation, participants were presented with three logos (see Table 2) and had to complete the scales of processing fluency, attitude towards the logo, the MSTAT-II scale and carry out the logo recognition task. Lastly, participants provided biographical data i.e. age, gender, highest completed education, and nationality. There were no participation incentives, monetary or otherwise. Participants took, on average, 10.5 minutes to complete the questionnaire (see Table 5). A one-way ANOVA showed Portuguese participants took, on average, significantly longer to complete the questionnaire than Dutch participants (F (1, 248.9) = 9.54, p = .002; see Table 5)[7]. No differences were found in questionnaire completion times across logo conditions (F (2, 264) = 1.23, p = .293).

Statistical treatment

Data was processed using IBM SPSS 27. Heterogeneity between the Dutch and Portuguese samples in terms of age led to the inclusion of it as a covariate when appropriate. Parametric statistical tests were conducted namely one and two-way analyses of co-variance, simple linear regressions and Pearson correlations. The absence of reporting on assumptions and potential corrective actions taken indicates no violations were detected.

Results

Tolerance of ambiguity

An independent samples *t*-test showed a significant difference between Dutch and Portuguese participants with regards to ToA (t (265) = 3.98, p < .001). Dutch participants (M = 4.39, SD = 0.90) were shown to have higher ToA than Portuguese participants (M = 3.92, SD = 3.92).

A linear regression showed that ToA could be explained for 7% by nationality (F (1,

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[7] Welch *F*-test is reported due to a significant Levene's test (F (2, 265) = 6,58, p = .011).

265) = 15.85, $p < .001$). Participants' nationality was a significant predictor for scores on the tolerance of ambiguity scale ($B = -.47$, $p < .001$). This means that when individuals are Portuguese, a decrease of .47 points can be expected in the ToA scale whereas when individuals are Dutch, a same-amount increase in ToA is anticipated.

Logo processing and recognition times

A two-way ANCOVA with logo completeness (complete, simpler, or simplest logo) and nationality (Dutch and Portuguese) as factors showed a significant main effect of nationality (F (1, 260) = 8.11, $p = .005$, $\eta^2 = .03$)[8] on logo processing time with age as a significant covariate (F (1, 260) = 57.84, $p < .001$, $\eta^2 = .18$). Regardless of logo completeness, Dutch participants took on average less time to process logos than Portuguese participants (see Table 6). There was also a significant main effect of condition on logo processing time (F (2, 260) = 10.42, $p < .001$, $\eta^2 = .07$). Pairwise comparisons showed that, regardless of nationality and when compared to simpler logos, it took participants, on average, significantly longer to process complete ($p < .001$; Bonferroni correction) and simplest logos ($p = .002$, Bonferroni correction) but no differences in processing time were found between complete and simplest logos ($p = 1$, Bonferroni correction; see Table 6). No significant interaction effect between nationality and condition was found (F (2, 260) = 3.79, $p = .024$, $\eta^2 = .03$).[7]

Table 6

Means and Standard Deviations for Logo Processing Time Across Nationality and Logo Completeness Conditions (values in seconds)

Nationality	Logo Completeness			Total M (SD)
	Complete M (SD)	Simpler M (SD)	Simplest M (SD)	
Dutch	15.58(7.96)	13.72(7.84)	15.48(6.83)	14.91(7.56)
Portuguese	28.33(16.92)	17.70(9.77)	24.03(12.85)	23.13(13.95)
Total	22.03(14.67)	15.82(9.09)	20(11.25)	19.19(12.05)

A two-way ANCOVA with logo completeness condition and nationality as factors with age as a significant covariate (F (1, 207) = 38.63, $p = <.001$, $\eta^2 = .16$) showed that there was no significant main effect of condition (F (2, 207) < 1) and no significant main effect of nationality (F (1, 207) = 5.14, $p = .024$, $\eta^2 = .02$)[9] on consumers' time spent in the logo recognition task

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[8] A significant Levene's test ($F(5,261) = 10.31$, $p < .001$) meant significance at $p \leq .01$(cf. Cohen, 1988, 1992).
[9] A significant Levene's test (F (5, 208) = 6.06, $p <.001$) meant significance at $p \leq .01$(cf. Cohen, 1988, 1992).

(see Table 7). No interaction effect between nationality and logo condition was found (F (2, 207) = 2.18, p = .115, η^2 = .02).[10]

Table 7

Means and Standard Deviations for Logo Recognition Time Across Nationality and Logo Completeness Conditions (values in seconds)

Nationality	Logo Completeness			Total *M* (*SD*)
	Complete *M* (*SD*)	Simpler *M* (*SD*)	Simplest *M* (*SD*)	
Dutch	22.30(11.41)	27.28(14.37)	24.86(16.79)	24.89(14.43)
Portuguese	51.96(34.82)	40.28(27.06)	38.12(38.11)	43.09(33.94)
Total	34.69(28.07)	32.62(21.37)	30.77(28.90)	32.63(26.21)

Processing fluency

A two-way ANCOVA with logo completeness and nationality as factors showed a significant main effect of logo completeness on consumers' processing fluency (F (2, 260) = 22.51, p < .001, η^2 = .15)[11]. Pairwise comparisons showed that, regardless of nationality, participants in the simplest condition reported a significantly lower processing fluency when compared with participants in the simpler (p < .001; Bonferroni correction) and complete (p < .001; Bonferroni correction) logo conditions but no significant differences were detected between the complete and simpler logo conditions (p = 1; Bonferroni correction; see Table 8).

Table 8

Means and Standard Deviations for Processing Fluency Across Nationality and Logo Completeness Conditions (1 = lower; 7 = higher)

Nationality	Logo Completeness			Total *M* (*SD*)
	Complete *M* (*SD*)	Simpler *M* (*SD*)	Simplest *M* (*SD*)	
Dutch	6.15(0.79)	6.18(0.80)	5.63(0.84)	5.99(0.84)
Portuguese	6.38(0.75)	6.43(0.69)	5.51(1.13)	6.10(0.97)
Total	6.27(0.78)	6.31(0.75)	5.57(1)	6.05(0.91)

There was also no significant main effect of nationality on consumers' processing fluency (F

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[10] Time spent on the recognition task was collected only for 80% (n = 214) of the total sample: Dutch n = 123(96%); Portuguese n = 91(66%); complete n = 67(79%); simpler n = 73(79%); simplest n = 74(83%).

[11] A significant Levene's test (F(5, 261) = 2.58, p = .027) meant significance at $p \leq .01$ (cf. Cohen, 1988, 1992).

$(1, 260) = 4.16$, $p = .042$, $\eta^2 = .02$)[11], no significant interaction between logo completeness and nationality (F $(2, 260) = 1.59$, $p = .206$, $\eta^2 = .01$) and age was not a significant covariate in the model ($F (1, 260) = 5.03$, $p = .026$, $\eta^2 = .02$)[11].

Attitude towards the logo

A two-way ANCOVA with nationality and logo completeness as factors showed a significant main effect of nationality on attitude towards ($F (1, 260) = 17.32$, $p < .001$, $\eta^2 = .06$)[12]. When condition was kept constant, Dutch participants manifested significantly more negative attitude towards the logo than Portuguese participants (see Table 9). No significant main effect of condition on attitude towards the logo was found ($F (2, 260) = 3.09$, $p < .045$, $\eta^2 = .02$)[11], no interaction effect occurred ($F (2, 260) < 1$) and age was not a significant covariate in the model ($F (1, 260) < 1$).

Table 9

Means and Standard Deviations for Attitude Towards the Logo Across Nationality and Logo Completeness Conditions (1 = more negative; 7 = more positive)

Nationality	Logo Completeness			Total M (SD)
	Complete M (SD)	Simpler M (SD)	Simplest M (SD)	
Dutch	4.59(0.85)	4.70(0.80)	4.39(0.99)	4.56(0.89)
Portuguese	5.32(0.89)	5.24(1.28)	4.87(1.01)	5.14(1.09)
Total	4.96(0.94)	4.98(1.10)	4.65(1.03)	4.86(1.04)

Logo recognition and identification

A two-way ANCOVA with nationality and logo completeness as factors showed no significant main effect of neither logo completeness ($F (2, 260) < 1$) nor nationality ($F (1, 260) < 1$) on the percentage of correct logo recognitions as well as no significant interaction effect between logo completeness and nationality ($F (1, 260) < 1$) with age as a significant covariate in the model $F (1, 260) = 12.19$, $p = .001$, $\eta^2 = .05$; see and Portuguese participants higher logo identification (see Table 11). A significant main effect

Table 10).

  A two-way ANCOVA with nationality and logo completeness as factors showed a

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[12] A significant Levene's test ($F(5, 261) = 3.72$, $p = .003$) meant significance at $p \leq .01$(cf. Cohen, 1988, 1992).

significant main effect of nationality on the logo identification scale (F (1, 260) = 46.89, $p <$ .001, η^2 = .15). Irrespective of condition, Dutch participants reported lower logo identification and Portuguese participants higher logo identification (see Table 11). A significant main effect

Table 10

Means and Standard Deviations for Percentage of Correct Logo Recognitions Across Nationality and Logo Completeness Conditions (values in percentage)

Nationality	Logo Completeness			Total *M* (*SD*)
	Complete *M* (*SD*)	Simpler *M* (*SD*)	Simplest *M* (*SD*)	
Dutch	90.52(18.43)	87.18(20.58)	87.36(23.20)	88.34(20.72)
Portuguese	82.23(25.57)	86.47(20.28)	84.45(22.91)	84.47(22.80)
Total	86.33(22.58)	86.81(20.32)	85.82(22.96)	86.33(21.87)

of condition was also found (F (2, 260) = 7.27, p = .001, η^2 = .05). Pairwise comparisons showed that, irrespective of nationality, participants' scores on the logo identification scale was significantly lower for the simplest condition when compared to complete (p = .003, Bonferroni correction) and simpler logo conditions (p = .003, Bonferroni correction) but there were no differences between the simpler and complete logo conditions (p = 1, Bonferroni correction; see Table 11). No interaction effect between nationality and condition was found (F (2, 260) <1) and age turned out to be a non-significant covariate in the model (F (1, 260) <1).

Table 11

Means and Standard Deviations for Scores in the Logo Identification Scale Across Nationality and Logo Completeness Conditions (1 = lower; 7 = higher)

Nationality	Logo Completeness			Total *M* (*SD*)
	Complete *M* (*SD*)	Simpler *M* (*SD*)	Simplest *M* (*SD*)	
Dutch	4.85(0.91)	4.85(0.81)	4.47(1.02)	4.73(0.93)
Portuguese	5.78(0.89)	5.76(0.97)	5.22(1.01)	5.58(0.99)
Total	5.32(1.01)	5.33(1)	4.87(1.08)	5.17(1.05)

Additional analysis

Following the stream of research linking processing time as a proxy for processing fluency discussed in the introduction, a correlation analysis was performed between logo processing time and processing fluency scale, which returned a significant weak negative correlation (*r*

(267) = -.25, $p < .001$). This means that as the time to process logo increases by 1 second, there is a decrease of .25 in the processing fluency scale.

A regression analysis showed that nationality explained 14% of the variance in attitude towards the logo (F (1, 265) = 41.87, $p < .001$). Nationality was a significant predictor of attitude towards the logo (B = -.72, $p < .001$) or rather when participants were Dutch, there was a decrease in the score on attitude towards the logo.

Conclusion and Discussion

Logos are are present in most, if not all, marketing communications targeted at consumers. Building a strong brand image simultaneously serves the purpose of making the brand easily recognisable while aiming to positively influence consumer responses towards the brand (Phillips et al., 2014). The advancement of information technologies has stimulated brands to adapt their image to new mediums and substantiated the goal of this research to investigate the extent to which different gradations of logo responsiveness (complete, simpler, and simplest) have an influence on consumers' processing fluency, logo recognition and attitude towards the logo. It was hypothesised that consumers would experience higher processing fluency in the complete logo condition when compared to the simplest condition (H1). Furthermore, it was expected that Dutch(Portuguese) consumers would report a more positive(more negative) attitude towards the simplest logos than Portuguese(Dutch) participants (H2 and H3, respectively). Findings endorsed H1 but no support was found for H2 nor for H3. A major finding of this research concerns the significant differences between the Dutch and Portuguese samples in terms of ToA which corroborate Hofstede's scores on UAI for The Netherlands and Portugal. Moreover, the good reliability of the MSTAT-II scale in both Dutch and Portuguese demonstrate its robustness as a multi-lingual measurement for ToA in cross-cultural research. The present research expands the literature on brand logos by offering valuable insights to the underdeveloped domain of responsive logos, acting as a foundation for future studies on this emerging logo design trend.

Tolerance of ambiguity
The high(low) ToA found for Portuguese(Dutch) consumers is in line with the UAI scores that Hofstede (1983, 1984, 2001) attributes to each country. Moreover, results from the linear regression confirmed that, within the sample, nationality had a medium effect on ToA, significantly accounting for 7% of the variation in it. When examining consumers' responses

to organic logo designs, Machado et al. (2015) and Torres et al. (2019) found significant differences in ToA between The Netherlands and Portugal. By focusing on the same countries, the current research builds on their work and offers a potential reason to justify the absence of cultural effects in the study by van Hooft et al. (2013). Contrary to the countries used by the last authors, Portugal and The Netherlands have sharp differences in UAI scores. Taken together, evidence seems to accumulate showing that, when including cultural dimensions in cross-cultural marketing research, comparisons between countries with more pronounced differences may be advisable. Otherwise, differences may be diminished beyond the point of detection and weaken conclusions drawn from results. An alternative could also reside in the replication of the methodology by van der Lans et al. (2009) who merged individual countries into cultural clusters.

The partial and overall good reliability of the MSTAT-II scale as a measure for ToA in both Portuguese and Dutch samples, reinforces the scale's potential as a consistent measurement for ToA across different countries and languages. Together with English (McLain, 2009), Polish (Lachowska & Ludwikowska, 2017) and Spanish (Arquero & McLain, 2010), there is now evidence for MSTAT-II scale reliability in both Portuguese and Dutch, with an overall cross-language reliability that, so far, was never below good ($\alpha \geq .79$). Outcomes of this study therefore answer the calls for an adequate measure for ToA in cross-cultural research, an issue that has plagued the domain for decades (Furnham & Marks, 2013; Herman et al., 2010). By adding to the robustness of MSTAT-II scale as reliable a measurement for ToA in multiple languages, results make a strong contribution to cross-cultural literature.

Logo recognition and identification
Grounded in the absence of a main effect of logo completeness on logo recognition, findings answer RQ1 by indicating different gradations of logo responsiveness do not influence neither consumers' logo recognition nor the time spent in the process of recalling them. Nonetheless, consumers seem to acknowledge that simpler logos are detrimental to their function of making brands easily recognisable. Interestingly, Portuguese consumers reported a higher logo identification meaning that, regardless of the gradation of logo responsiveness seen, they believed brand logos were more helpful to identify the brands. Considering the Portuguese sample was significantly older than the Dutch sample it can be safely assumed that consumers from Portugal were more familiar with the brand logos used as stimuli. With this in mind, the absence of a significant main effect of nationality on the time spent in the logo recognition task contrasts with previous findings that brand familiarity can improve consumers' time searching

for logos (Qin et al., 2014) or that increased exposure to logos can add to increased logo recognition (van Grinsven & Das, 2014). In sum, results show that different gradations of logo responsiveness have the potential to exert a higher influence on consumers' perceptions about their ability to identify logos than their actual aptitude to do so.

Whilst logos serve the purpose of being distinctive and thus facilitate recognition (Farhana, 2012), this research hints that responsive logos do not pose a threat to such goal. Irrespective of that, and since consumers reported that logos in the simplest logo condition helped them less to identify the brand, there is a possibility that responsive logos negatively affect consumers' perceptions of brand image, a target for which brands aim for (Kohli & Suri, 2002). Taken together, it appears that brands wanting to implement responsive logos in their corporate visual identity need to be aware there might be a trade-off between consumers' absolute logo recognition and their perceptions of brand image. Nonetheless, as brands also seek that their corporate logos lead to false recognition (Henderson & Cote, 1998; Henderson et al., 2003), logos should have design elements that facilitate the identification of the brand over characteristics that increase the recognition of the logo itself. With this approach, brands can better capitalise on their logos as visual manifestations of corporate values and beliefs which represent higher chances of an improved brand image and corporate reputation (Foroudi, Hafeez, et al., 2017; Kaur & Kaur, 2019).

Processing fluency and logo processing times

Answering RQ2 and supporting H1, logo completeness were responsible for 15% of the variation in processing fluency. This result calls for further research on logos, responsive or otherwise, with emphasis on highly contrasting logo variations. As processing fluency was significantly lower in the simplest condition than in the simpler or in the complete logo conditions, it appears that logo simplicity is detrimental for processing fluency. Siding with these results are those of Luffarelli et al. (2019) who showed that more descriptive logos facilitate processing and those of Janiszewski and Meyvis (2001) who reported consumers can favour single(vs. multiple)-meaning logos based on the processing fluency experienced when interpreting stimuli. Based on these findings, one could argue that brands should opt for more complex logos for their corporate identity. However, evidence of the long-term benefits of more complex logos (van Grinsven & Das, 2014) is countered by the fact that multiple exposures to visually complex logos may shift consumers' initial positive attitude towards the logo into negative attitudinal behaviour (Miceli et al., 2014). Owing to this, brands should strive for a balance between logo complexity and exposure frequency to minimise the potential of negative

consumer responses.

Differences in logo processing times across nationalities with Portuguese participants taking significantly longer to process logos than Dutch participants represent an interesting finding. Since the distribution of nationality was homogenous across logo conditions but heterogenous in terms of age, results should have been contrary to those found. Being older than Dutch participants, Portuguese participants could be assumed to have higher familiarity with the brands in this study. Drawing from Qin et al. (2014), this should have translated to a stronger prominence of logos in Portuguese consumers' minds and, as a result, faster processing, but this did not occur. A potential explanation for this result may reside in country differences in ToA. Portuguese participants, having lower ToA, may have conducted a more thorough analysis of logos to maximize their comprehension of the stimuli while minimising the potential for incomplete or ambiguous interpretations. On the other hand, Dutch participants, with higher ToA, may have naturally processed the logos in a more lenient manner, indifferent to the risk of incomplete or ambiguous processing. Indeed, the fact that, regardless of nationality, the simpler condition was processed more quickly than the complete or simplest logo conditions partially supports this reasoning as logos in that condition were identical to the logos currently used by each brand and, consequently, more familiar to participants. Overall, the role of logo familiarity in processing time is highlighted but results seem to suggest cultural dimensions, ToA in this research, might affect not only *how* consumers decode and interpret logos but also *how long* individuals spend on the process. Combining this with previous literature on visual perception (Sample et al., 2019) and on visual information processing (Adaval et al., 2018) raises the question as to whether members of a culture are conditioned by cultural values to the point of having their visual systems shaped to interpret visual stimuli in a specific manner.

As for the additional analysis that uncovered a weak correlation between processing fluency and processing time, this research provides fragile support to previous literature that used processing time as a proxy for processing fluency (van Grinsven & Das, 2015). This can be explained by other factors underlying or linked to processing fluency such as aesthetic pleasure (Reber et al., 2004). Based on results from this study, using processing time as a proxy for processing fluency is not advised for future research pending further empirical evidence on the relationship of processing fluency with such factors is examined.

Attitude Towards the Logo

The two-way ANCOVA for nationality and logo condition as factors with effect on attitude

towards the logo answered RQ3 and did not offer support for H2 nor for H3 although a significant main effect of nationality on attitude towards the logo was found. Dutch participants generally reported a more negative attitude towards the logo than Portuguese participants. A non-significant main effect of logo condition on attitude towards the logo hints the responsiveness manipulation does not justify these results but the logos chosen for stimuli, particularly their colours, might. In any logo condition, Levi's logo included an icon in a red-colour variant and the background of Guinness' logo was black. With previous research having shown that red and black colours can represent various meanings for members of different cultures (Madden et al., 2018), it appears the colours of logos chosen for stimuli could explain obtained results. Moreover, there were significant differences between Portugal and The Netherlands in ToA, but the countries also differ in other cultural dimensions such as power distance and indulgence, two dimensions previously shown to affect consumer behaviours (Wang et al., 2020; Yýldýrým et al., 2016). In short, though results for attitudes towards the logo rejected H2 and H3, they emphasise the potential of logo characteristics to evoke different responses in different cultures.

It is important to note that attitude towards the logo was operationalised through aesthetic appeal. Since there was no main effect of nationality on processing fluency, no support is found for the reasoning that aesthetic perceptions can be linked to variations in processing fluency (Reber et al., 2004). Yet, as the Portuguese sample was significantly older than the Dutch sample, it may be that the first had been exposed more frequently to the original brand logos than the latter, resulting in more positive attitudes and in line with the *mere exposure effect* (e.g. Fang et al., 2007; Inoue et al., 2018; Zajonc, 1968). An alternative explanation for results found in attitude towards the logo could reside in consumers having evaluated logos in the experiment by comparing them to the "original" brand logos, an action which may have led to contrast or assimilation effects (Shen et al., 2010). Furthermore, though the manipulation of the different gradations of logo responsiveness was effective, consumers may have taken the different logos as changes of the original brand logos rather than as logo variations based on the screen responsiveness of one single logo. Given Peterson et al. (2015) has shown that consumers' uncertainty about logo changes can interfere with their responses to logos, it could be argued that Dutch consumers generally reported a more negative attitude towards the logo because they were more doubtful about the changes than Portuguese consumers were. Indeed, this may have been the case because nationality was a significant predictor of attitude towards the logo with a strong effect (14%) and Dutch nationality entailing a decrease in ratings on the aesthetic appeal scale.

General Discussion and Implications for Theory and Practice

This research addresses the gap of missing research on responsive logos by showing that different gradations of logo responsiveness can influence consumers' processing fluency and attitude towards the logo in terms of aesthetic appeal but not logo recognition. Furthermore, differences in ToA for Portugal and The Netherlands add to the field of cross-cultural marketing research. Overall, the relevance of the current research is twofold.

First, the link of ToA with UAI is reinforced and helps to untangle the criticism that the cultural dimensions from Hofstede (1983, 1984, 2001, 2011) have received in recent years (e.g. Beugelsdijk & Welzel, 2018; Tung & Verbeke, 2010). Results for ToA in the current research therefore corroborate methodologies of e.g. Stewart Jr et al. (2003) who used ToA and UAI as equivalents or that of Madzar (2005) who referred to one concept as a proxy for the other. Still, caution is advised when designing experiments including these dimensions because both constructs differ in their temporal orientation: ToA stresses the present while UAI has an orientation towards the future (Grenier et al., 2005). One could argue this was at the origin of some of the results considering Portugal and The Netherlands also differ in Hofstede's dimension of long-term orientation. More than investigating the effects isolate cultural dimensions have on consumers' responses to logos, researchers should thus attempt to include more than one dimension e.g. by combining UAI *and* ToA in one study or by looking into variations in cultural dimensions within one same culture. Such setting has the potential to yield meaningful insights on the role of culture, in the broader sense, on consumers' judgements mainly because previous research has found significant differences within one same country can occur (Gupta et al., 2021). In either case, cultural dimensions should be empirically measured with instruments that have shown consistency across time, cultures and languages – such as the 13-item MSTAT-II scale (McLain, 2009), improved from the original 22-item MSTAT-I scale (McLain, 1993) – rather than exclusively making use of Hofstede's cultural dimension scores (e.g. Machado et al., 2015; Torres et al., 2019).

Second, the fact that the manipulation of the different gradations of logo responsiveness was effective paves the way for future research on logo responsiveness and highlights the motives behind the apparent lack of interest on the topic. Although logo digitalisation is a trend which has penetrated marketing practices (Mort & Drennan, 2002), this does not seem to translate in a wider adoption of responsive logos. A reason that could explain this may be connected to how a responsive logo functions. Previous research on responses to logos undertake a logo as a single unit with any alterations configuring logo changes (Grobert et al., 2016; van Grinsven & Das, 2015, 2016). This has led to design guidelines that assume one logo

as a single unit, a principle not applicable to responsive logos, in which different variations of one logo *are* one logo. As responsive logos, due to their nature, add, remove, or reposition the elements that constitute the logo, these may be perceived not as gradations of one same logo but rather as changes departing from one baseline logo, a fact that might influence consumers' responses in a way that brands do not desire. Because of this, and drawing from this research's findings, brands' visual identity and communications with consumers should be as explicit as possible. Brands can evaluate how explicit their communications are by including ToA in their market research which may be why ToA has been receiving more attention from marketing research in recent years (see Furnham & Marks, 2013).

Limitations and Future Research

Notwithstanding its contributions to marketing literature and marketing practitioners, this study is not without its limitations. One major limitation of this study concerns the experimental setting under which participants were exposed to stimuli. Due to constraints connected to the global COVID-19 pandemic, the experiment had to be conducted by means of an online questionnaire. This operationalisation justifies the broad range of questionnaire answer times which motivated the exclusion of 14 cases from analysis and suggests participants may have been distracted or multitasked during questionnaire completion. Such behaviour may have played a role because multitasking is generally detrimental to consumer memory, in particular for advertising recall and recognition (Angell et al., 2016). To address this, future research should include safeguards for data quality management e.g. a control group that could counterbalance the "less control over the conditions in which respondents fill out an online questionnaire" (Geuens & De Pelsmacker, 2017, p. 91).

A second limitation pertains to the significant difference in age between the Dutch and Portuguese samples. The younger age of Dutch participants potentially underlies the violation of assumptions in several statistical tests which imposed a stricter significance threshold (Cohen, 1988, 1992) which led to the dismissal of several interaction effects. This also hints the sample was mainly composed by students. Using student samples in marketing research is long contested for presumably not reflecting the behaviour of a typical consumer (for a discussion see Fuchs & Sarstedt, 2010) and such debate has even lead scholars to use a "non-student consumer" label to make a distinction (Sung et al., 2009). However, there is recent evidence that while partially supporting these notions, also shows that differences can occur between demographically identical student populations or that homogeneity can be artificially inflated with samples collected within one same institution (Espinosa & Ortinau, 2016). For the

samples used in this research, this may have meant e.g. that younger Dutch participants were less familiar with Guinness or less appreciative of the brand/product, known to gather the preference of older consumers. The impacts of such issues on differences in consumer responses may have been supressed with the use of compound means over data from individual logos but nevertheless constitutes a constraint in the experimental setup. Ultimately, the present research should be replicated with two identical samples i.e. two student samples or two non-student samples to further validate current findings. For researchers, combining current findings with literature suggests that avoiding sample heterogenity should be a priority in cross-cultural marketing research allowing for results with higher ecological validity.

A third and final limitation of the current research is the measurement for processing fluency which was self-reported on a 7-point Likert scale. The absence of empirical data on responsive logos justified the aggregation of data from individual logos as one unit, an operationalisation that artificially reduced brand logos to their visual elements while overlooking aspects e.g. brand familiarity or brand personality either of which has been shown to influence consumer responses to logos in connection with variations in processing fluency (Kaur & Kaur, 2019; Morgan et al., 2021). In addition, there is evidence suggesting processing fluency can have a mediating role on consumers' evaluations of visual stimuli (Shen et al., 2010; Storme et al., 2015). As Wänke and Hansen (2015) claimed fluency effects are contingent on how experienced levels of processing fluency deviate from consumers' expectations of fluency level, exclusively measuring one type of fluency over another may bias results and the conclusions drawn from them. This is further aggravated by the fact that responsive logos encompass adjustments in spacing (Janiszewski & Meyvis, 2001), proportion (Pittard et al., 2007) or complexity (Miceli et al., 2014; van Grinsven & Das, 2014), all of which affect consumers' perceptions, evaluations and attitudinal behaviour. Future research on responsive logos, but also on logos in general, should therefore aim towards a combined measurement of absolute and relative processing fluency while controlling for these logo design aspects e.g. through comprehensive pre-tests or control groups (Geuens & De Pelsmacker, 2017).

To conclude, findings from this research and those of previous literature on brand logos suggest that, while research on responsive logos remains underdeveloped, implementing a responsive logo may be beneficial in terms of functionality e.g. logo recognition. Still, understanding the extent to which those benefits can materialise into desired brand image (Kaur & Kaur, 2019), corporate reputation (Foroudi, Hafeez, et al., 2017) or performance (Park et al., 2013) remains unclear and calls for further research. Hence, while the domain of responsive logos evolves, brands should maintain the strategy of "flattening" their logos for

communicating on digital platforms. In the short-term, this practice seems to be appropriate and beneficial to the brand because of its potential to prompt positive responses in consumers (van Grinsven & Das, 2014).

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Appendix A

Table A1

Logo Deceivers per Logo Experimental Condition.

Logo Completeness		
Complete	Simpler	Simplest

Appendix B

The 13 Items Composing the MSTAT-II scale (based on McLain, 2009)

1. I don't tolerate ambiguous situations well. [r]

2. I would rather avoid solving a problem that must be viewed from several different perspectives. [r]

3. I try to avoid situations that are ambiguous. [r]

4. I prefer familiar situations to new ones. [r]

5. Problems that cannot be considered from just one point of view are a little threatening. [r]

6. I avoid situations that are too complicated for me to easily understand. [r]

7. I am tolerant of ambiguous situations.

8. I enjoy tackling problems that are complex enough to be ambiguous.

9. I try to avoid problems that don't seem to have only one "best" solution. [r]

10. I generally prefer novelty over familiarity.

11. I dislike ambiguous situations. [r]

12.I find it hard to make a choice when the outcome is uncertain. [r]

13. I prefer a situation in which there is some ambiguity.

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[r] Item reverse coded.