The anthropomorphic brand logo and its effect on perceived functional performance

Abstract

Anthropomorphic logos representing culturally embedded iconic character are used by firms to signal the expected performance of their brands. Yet, the extent to which such anthropomorphic brand logos influence consumers' perceptions of an associated product's or service's functional performance is not well understood. We address this gap in the literature by conducting a study using a hypothetical anthropomorphised logo to gather survey data. Using structural equation modelling (SEM) to test our research hypotheses, our findings show that an anthropomorphised logo representing a culturally embedded iconic character has a positive impact on perceived functional performance. More importantly, we show that the effect is strengthened as the appeal of the logo increases. Additional analysis revealed that logo-self connection explained the mechanism through which logo anthropomorphism affects the perceived functional benefits of the logo.

Keywords – Brand logo, Logo anthropomorphism, perceived functional performance, logo association, logo – self connection

1 Introduction

Anthropomorphic brand logos imbued with human-like traits, features, and characteristics are a well-established feature of marketing activity; for example, Michelin's Bibendum is one of the longest serving and best-known examples of this type (Brown 2010; Cayla 2013). However, relatively limited attention is paid in the marketing literature to their effectiveness (Duffy 2014), so that existing studies provide little guidance on their functional benefits. In this research, we examine consumer responses to anthropomorphic logos. To the best of our knowledge, the current paper is the first to address the subject of the anthropomorphic logo and its effect on the perceived functional performance of an associated product or service.

In this paper, we seek to contribute to anthropomorphic brand logo research in the following way. Extant research has examined brand anthropomorphism (Lee and Oh 2019); however, this literature has neglected the anthropomorphised logo as an important route to brand anthropomorphism. We propose anthropomorphising a brand logo may provide a more appropriate route for a brand humanization strategy when compared with other approaches such as anthropomorphising a brand via a product (i.e., product anthropomorphism) or by using message framing.

In the operationalization of brand anthropomorphism, previous studies have operationalized brand anthropomorphism by either assigning anthropomorphic cues in the design element of the product (Golossenko, Pillai, and Aroean 2020) or message framing through the use of first-person pronouns in the text (Puzakova and Aggarwal 2018; Lee and

Oh 2019). Examples of the latter are “I am Shapiro” in Puzakova and Aggarwal (2018)’s experiment, and “You should stay with me” in Lee and Oh’s (2019) study.

Here we challenge the commercial applicability of this approach. We argue that the anthropomorphising strategy of imbuing a product with human-elements may not be generalizable across other products of the same brand. Additionally, we suggest using message framing to anthropomorphise a brand has limited applications and will not be generalizable beyond the context being studied. That is, anthropomorphising a brand using a first-person pronoun is temporary and context-specific, which might only be effective when consumers are being exposed to specific anthropomorphic cues; for example, when viewing a print advertisement.

In response, and in contrast, we argue that anthropomorphising a brand via its logo (termed as logo anthropomorphism) can be independent of context and product designs; thereby, providing a more memorable and durable brand message. Furthermore, we suggest anthropomorphic logos may trigger associations that consumers have with the logo, which we term logo association. We reason, this association resides in consumers’ memory and is akin to the general concept of brand association (Keller 1993). For example, when seeing Nike’s swoosh, the logo may immediately remind consumers of Michael Jordan. This perspective on logo anthropomorphism has not been examined in the anthropomorphism literature.

Further, we note that the role of brand anthropomorphism in the formation of brand-self connection is insufficiently developed in the literature. Brand-self connection has been conceptualised as self-focused brand anthropomorphism (MacInnis and Folkes 2017). According to this paradigm, when consumers are connected to a brand, their responses to such

events as brand failure can be construed as responses akin to those they would have toward another living entity: blaming a brand for its failure as if it is a person. However, the relationship between anthropomorphism and brand-self connection has not been explained. Consequently, the effect of brand anthropomorphism on the formation of brand-self connection is under researched.

In response to this gap in the literature, we seek to contribute to the literature by showing how products that have past associations (Holbrook and Schindler 1994) or brands that invoke nostalgia (Kessous, Roux, and Chandon 2015) may have a positive effect on brand-self connection. Therefore, we consider how cultural embeddedness enhances brand-self connection. Specifically, we investigate how logo anthropomorphism influences the way in which consumers build a connection with the logo; this we term logo-self connection. In this way, we seek to contribute to the literature on logos by investigating the relationship between logo anthropomorphism and logo-self connection. Lastly, we advance understanding in this area by investigating logo-self connection as a potential mediator of the relationship between logo anthropomorphism and perceived performance appeal.

The lack of evaluative research on logo performance leaves an important gap in academic and commercial understanding of this phenomenon. It is an important gap because of the prevalence of anthropomorphised logos in marketing communications. Firms continue to invest significantly in the development of logo anthropomorphism and associated advertising campaigns; they have done so for an extended period of time. Therefore, there is a commercial need to understand the functional performance of this process. From a theoretical perspective, if anthropomorphic representation of brand logos does have an effect on the functional performance of products and services, there is a pressing need to understand the

mechanisms that drive this process. In the research presented here, we seek to address the following substantive research questions:

RQ1. Does anthropomorphic representation of a brand logo have a positive effect on consumer perceptions of associated product functional performance?

RQ2. If it does, what underlying mechanisms explain the effect?

This article is organized as follows. First, we review the theoretical background and related literature relevant to the focal constructs used in our study. Then, we develop our hypotheses and present our theoretical framework. Then, we describe the methodology and report our study findings. Finally, we discuss the implications, limitations, and directions for future research.

2 Theoretical background

Brand logos contribute to consumer perceptions of brands in combination with other brand elements. However, as author's such as Keller (1999) have established, separate consideration can be given to brand elements such as brand mantra to explore how they contribute to the overall working of the brand. As he notes, a mantra "provides memorable short-hand as to what are the crucial considerations of the brand that should be kept most salient and top-of-mind" (Keller 1999, p. 45). So that where brand mantras provide verbal representations of the brand in short - often three-word - phrases which capture brand essence, logos are pictorial representations that convey a brand's essence, spirit and positioning. In the section below, we explore how logo anthropomorphism contributes to this process.

2.1 Anthropomorphism theory

Anthropomorphism has been conceptualized as the tendency for individuals to perceive human characters, emotions, motivations, or intentions in non-human objects (Epley, Waytz, and Cacioppo 2007). The application of anthropomorphism theory is prevalent in marketing where brands or products were given human-like characteristics to make them more distinctive, memorable, endearing, likeable, and to provide them with a soul (Aggarwal and McGill 2007). These acts of humanizing brands or products are expected to influence consumers' positive evaluations towards the brands or products. In relation to brand anthropomorphism, recent research has shown that brand anthropomorphism has a positive impact on how consumers evaluate a brand through such as brand value perception (Zhang et al. 2020; Puzakova and Aggarwal 2018), brand love (Rauschnabel and Ahuvia 2014), brand prestige (Tuškej and Podnar 2018), and purchase intention (Kim, Sung, and Moon 2020). Nevertheless, anthropomorphism is not limited to the formal marketing practice of adding anthropomorphic features to brands or products; consumers have a role in anthropomorphising brands or products through engagement with a brand. For example, consumers anthropomorphize their iPhones or MacBook because of the personalisation that the devices offer (Wang 2017).

There are three psychological factors that affect consumers' tendency to anthropomorphise brands or products: elicited agent knowledge, sociality, and effectance (Epley, Waytz, and Cacioppo 2007). First, consumers are more likely to anthropomorphise brands or products if the anthropocentric knowledge is accessible and applicable (elicited agent knowledge factor). For example, knowledge about the Michelin man logo can influence consumers' judgements about the Michelin brand. Second, consumers' need for social connection or approval from other consumers can influence the development of anthropomorphic thoughts (sociality motivation factor). For example, Lee and Oh (2019)

demonstrated that if consumers were exposed to hotel advertising which highlights social bonding, they are more likely to perceive the hotel brand as warm. Third, consumers' tendency to anthropomorphize can occur through a desire to reduce uncertainty about brands or products and seek meaning (effectance motivation factor). For example, even in a context with negative connotations such as the frequent experience of brand failure, this can lead to consumers thinking that a brand possesses a mind of its own (Waytz et al. 2010). Hart, Jones, and Royne (2013) found that consumers are more likely to anthropomorphize complex products than simple products in order to cope with product complexity.

2.2 Logo anthropomorphism

Logos are an important means of brand identification and differentiation (MacInnis, Shapiro, and Mani 1999). They can generate positive emotions, communicate brand values, shape brand reputation (Baker and Balmer 1997; Olins 1990), influence purchase intentions (Jun, Cho, and Kwon 2008) and engender brand loyalty (Müller, Kocher, and Crettaz 2013). Additionally, as Park et al. (2013) demonstrate, brand logos provide expressive, functional and aesthetic benefits that may affect consumers' commitment to a brand and thereby subsequently influence firm performance.

In this research, we propose a new construct derived from brand anthropomorphism. Brand anthropomorphism predicates on the idea that when consumers perceive a brand to be less abstract and more like a person, consumers will be more likely to build a relationship with the brand (Fournier, 1998). Although there is a considerable literature on brand anthropomorphism (e.g., Puzakova and Aggarwal 2018; Lee and Oh 2019), research on the anthropomorphised brand logo is limited. This is surprising because a logo is an integral component of a brand that may contribute to the formation of brand anthropomorphism. Given

the role of logos in consumer brand identification, we contend that brand logos may be an important aspect of the anthropomorphism process.

Although research on the humanizing of brands through the mechanism of the brand logo is limited, Duffy (2014)'s work on the humanizing of 'Plant-based' logo design has begun to address this area. Using visual images, Duffy (2014) found that enculturation created positive associations, resulting in consumer attraction to a brand logo with anthropomorphic qualities. However, to the best of our knowledge, there is no existing research on the effect of humanized brand logos, logo-self connections and perceived functional performance.

Before developing our research hypotheses on the antecedents and consequences of humanized brand logos, which we term here as logo anthropomorphism, we define logo anthropomorphism as a consumer tendency to attribute human-like characteristics to a brand logo where the logo is designed in such a way as to intentionally convey human-like characteristics. In this research, we view logo anthropomorphism as a rhetorical device within a brand communication strategy.

Conceptualization of logo anthropomorphism differs from that of brand anthropomorphism in two ways. First, a brand name is immutable, while logos are not. While brand names are unchanged to ensure consistency and continuity, brand logos may experience numerous changes. For example, Michelin's Bibendum has undergone several changes in its design from its first creation (see Harp and Harp 2001). Consequently, logo anthropomorphism follows changes in the design of the logo. Second, the logo is a visual element of a brand in the form of graphic design that a firm uses with or without the firm's name (Henderson and Cote 1998). Thus, logo anthropomorphism occurs through the visual elements of the logo and is

independent of product designs. In contrast, brand anthropomorphism may stem from product designs where consumers anthropomorphise a brand based on product characteristics (Ketron and Naletelich 2019). For instance, Golossenko, Pillai, and Aroean (2020) used products imbued with human-like characteristics, such as product shape, as stimuli to measure brand anthropomorphism. Thus, while brand anthropomorphism is contingent on product designs, logo anthropomorphism can be independent of them.

2.3 Antecedents of logo anthropomorphism

The antecedents of logo anthropomorphism are likely to be determined by consumers reading of a logo within a personal and socio-cultural context. Indeed, according to Epley, Waytz, and Cacioppo (2007, p. 870), culture influences anthropomorphism by "by providing distinct norms and ideologies about how people relate to others and the natural world, or by influencing the general level of experience with particular nonhuman agents and the acquisition of nonanthropomorphic representations." The brand literature suggests that brand associations influence consumers understanding of a brand and hence their connectivity with it. Associations, on a personal level, may take the form of nostalgic reflection (Kessous, Roux, and Chandon 2015), or within a wider socio-cultural context they may manifest through the role of brand narrative (Escalas 2004).

Concomitantly, where a logo is associated with a culturally embedded iconic character the association has the potential to enhance logo anthropomorphism. That is, consumers transfer images of the iconic character to the logo. This rationale is consistent with the motivational process of brand anthropomorphism as postulated by Aggarwal and McGill (2012, p. 308) that "consumers are motivated by their desire to achieve the key personality or trait dimension associated with the brand". Thus, we hypothesize:

H1. Logo association is positively related to logo anthropomorphism

Brand familiarity is influenced by consumers' first encounter with a brand. For example, Chaplin and Roedder John (2005) suggest that consumers are more likely to connect with a brand within middle childhood and early adolescence. The importance of familiarity is further emphasised by research which shows that the longevity of brand relationships is found to affect brand connection (Reimann et al. 2012; Park et al. 2010). In this research, we propose that the extent to which consumers are familiar with a brand logo (i.e., logo familiarity), and the extent to which they can associate a logo with known objects or characters (i.e., logo association), will reinforce logo anthropomorphism. Using concepts analogous to brand familiarity, we suggest that icon familiarity can affect logo anthropomorphism. Thus, we propose the following hypothesis:

H2. Icon familiarity is positively related to logo anthropomorphism

2.4 Logo-self connection

The literature suggests that consumers connect with a brand through their self-identity or goal fulfilling objectives. Chaplin and Roedder John (2005) suggest brand-self connection occurs when there are similarities between a brand image and a consumer's self-image; while Escalas and Bettman (2005) suggest it occurs when consumers self-connect with socio-cultural brand associations which allow consumers to reflect or construct their actual or ideal identity. Using Fournier (1998)'s identity resonance perspective, Park et al. (2010) suggests consumers connect with the brand when the brand overlaps with the consumers' self. So that the

connection between consumer and the brand is affected by relationship closeness, which varies from complete overlap between the brand and the self (the brand is me, and I am the brand) to extreme distance between the brand and the self. The more brand-self connections increase, the more consumers perceive their relationship with the brand to be one that gives them positive value and experience. This is consistent with Belk's (1988) assertion that consumers may regard a brand as an extension of the self.

Consequently, consumers who have strong connections with a brand are more likely to show stronger and more positive brand attitudes (Moore and Homer 2008). Brand-self connections can affect how consumers become very close to a brand, and hence as the brand becomes closer to the consumers' self, consumers are more likely to be loyal to the brand (Tsai 2011). However, there is an absence of research on the effect of consumers' connections with particular elements of the brand, such as the brand logo. Therefore, the current research proposes that just as self-connections are formed with a brand, self-connection can be formed with a more specific element of the brand, for example, a brand's logo.

Therefore, we suggest that logo-self connection is the extent to which a brand's logo resonates with the consumer's self-identity. In this research, we propose that the connection between the consumer and a brand logo is enhanced where there are socio-cultural associations. These socio-cultural associations we contend enhance and strengthen logo anthropomorphism. We propose:

H3a. Logo anthropomorphism is positively related to logo-self connection

2.5 Perceived functional performance

Brand logo as a visual symbol of a brand is commonly seen as a means of distinguishing a brand from its competitors and a means of facilitating the development of brand image. However, additionally consumers can infer the functional benefits of a brand from its logo (Park et al. 2013), which we term here as perceived functional performance. For instance, Nike's Jumpman logo suggests high performance because it is associated with Michael Jordan top level performance during his basketball career. Another example is Admiral's Nelsonian logo suggesting competence, steadfastness and heritage. Common to these two examples is brand logo personification (Chen et al. 2015; Brown 2010). What is less well-understood in the literature is to what extent the personification of a brand logo contributes to perceived functional performance.

Therefore, we argue that the positive impact of brand logo is enhanced if the brand logo is anthropomorphised. We use social presence theory (e.g., Argo, Dahl, and Manchanda 2005) as our theoretical lens to justify our assertion. According to this theory, consumers may be affected by the mere presence of social stimuli (for example, an imagined image) in a shopping environment. Translating the mere presence effect into our research context, we contend that the humanisation process associated with an anthropomorphised logo may instil a feeling of social presence. That is, an anthropomorphic logo encourages consumers to perceive a humanised product and/or service experience, thereby triggering the perception of social presence. In this context, the logo communicates enhanced performance and provides assurance. Indeed, previous research on perceptions of social presence indicates that it can positively influence consumers' trust and their positive evaluation of a product and/or service experience (Hassanein and Head 2007; Osei-Frimpong and McLean 2018). Based on the discussion above, we propose:

H3b. Logo anthropomorphism is positively related to perceived functional performance.

2.6 The role of logo aesthetic appeal

Previous research has shown that logo aesthetic appeal is a key determinant of connecting a brand with consumers (Bresciani and Del Ponte 2017). Indeed, the aesthetic appeal of a logo can lead to a positive brand attitude formation and increases the extent to which consumers can identify themselves with the brand logo (Walsh, Winterich, and Mittal 2010). Thus, we hypothesize:

H4a. Logo aesthetic appeal is positively related to logo-self connection.

According to Park et al (2013, p. 182), "Logos, as visual representations of brands, are capable of reminding customers of a brand's functional benefits and/or communicating such benefits to them". In addition, the aesthetic logo makes the brand more vivid in consumers' memories (Walsh, Winterich, and Mittal 2010). Based on processing fluency accounts (see Van Rompay and Pruyn 2011), an aesthetic logo is easier for consumers to process than a non-aesthetic logo; therefore, the former can positively affect perceptions of brand value. Thus, we propose:

H4b. Logo aesthetic appeal is positively related to perceived functional performance.

2.7 Moderation effect of logo aesthetic appeal

The attractiveness of the visual appearance of logos and brand characters, such as Hello Kitty, can increase consumers' engagement with the logo, brand characters and the brand itself

(Pérez-Vega et al. 2018; Hosany et al. 2013). Therefore, we argue that the positive impact of logo anthropomorphism on logo-self connection will be enhanced if brand logo is more aesthetically appealing. That is, the relationship becomes stronger as the brand logo is perceived to be more aesthetically attractive. We propose:

H5. The positive relationship between logo anthropomorphism and logo-self connection will become stronger as the aesthetic appeal of logo increases.

3 Method

We developed a survey questionnaire to measure the focal constructs in our study and collected data using an online survey through Prolific Academic, an online crowdsourcing platform. In our questionnaire, respondents were presented with an anthropomorphised logo that we explained in more details in the next section. Next, respondents were asked to answer series of questions to measure our constructs and filled in demographic questions.

3.1 Logo development

To put respondents in the context of evaluating an anthropomorphised logo, in our survey questionnaire, we presented respondents with a hypothetical scenario. In the scenario, they were asked to imagine that they were using the service of a fictional price comparison website called PriceInvestigate.com to buy an insurance policy to cover their next holiday trip. They were also informed that PriceInvestigate.com is a well-established company that has millions of visitors each month and promises customers a better insurance deal. Next, they were presented with the company logo (see Figure 2). While we use a hypothetical scenario, our study does not entail an experiment because we do not manipulate a variable as required in an experimental study (Wickens and Keppel 2004). Although, it might be argued that we should

compare the logo condition with the non-logo condition, after assessing the antecedents of logo anthropomorphism (H1 and H2) in the non-logo condition, it is shown clearly that this is not valid. An example of research that has a similar design as ours is Moussawi, Koufaris, and Benbunan-Fich (2020).

----- Insert Figure 2 here ----

The logo that we developed for the scenario was inspired by the iconic fictional private detective character Sherlock Holmes, which was created by British author Sir Arthur Conan Doyle. According to the original illustrations by Sidney Paget, and based on descriptions in the novels, Sherlock Holmes was a detective who wears an overcoat with face-framing collar, a deerstalker-cap and holds a magnifying glass on some occasions (Harrington 2007). We use key elements of Sherlock's sartorial style in our logo design and updated the magnifying glass by transforming it into a flashlight. We then used a strapline in our logo to represent the unique-selling point of PriceInvestigate.com, the fictional brand that we created for this research. The slogan we use is, 'PriceInvestigate.com gives you a better insurance deal'.

We choose this particular iconic character to facilitate an investigation of the antecedents of anthropomorphism which exist beyond the representational elements or cues embedded in the logo design. We were aware that by presenting consumers with items for measuring logo-associations (for example, 'The logo reminds me of 'Sherlock Holmes') priming effects occurred, triggering consumers to build an association between the logo and the Sherlock Holmes character. If a neutral character was used or participants were not presented with the items measuring logo association and icon familiarity, these two antecedents can be dropped from our conceptual model.

3.2 Assessment on non-response bias

In data collection, non-response bias may occur where survey results do not reflect those of the population. The bias arises if people who participate in a survey have opinions that differ systematically from those that do not participate (e.g., Daly and Nataraajan 2015). We sought to avoid non-response bias by (1) pre-testing the survey, (2) providing incentives to reward respondents' participation, (3) ensuring confidentiality. Unlike a postal survey, our respondents did not know the detailed content of our survey before they agreed to participate. None of respondents dropped out of our online survey. We also employ a widely accepted technique in mail-survey to assess non-response bias by comparing early respondents to late respondents on the mean scores on the key constructs and demographics; known as the continuum resistance model, it treats late respondents as non-respondents (Clarsen et al. 2021). We defined early respondents as those who participated in our survey within two days of the Prolific email invitation, and late respondents as those who clicked our survey link two days before the survey ended. Our results show no significant differences. Given this outcome, non-response bias does not appear to be an issue in our study, (see, Daly and Nataraajan (2015) observations on the lack of non-response bias in crowdsourcing platform research).

3.3 Measures

We used self-developed items to measure logo association, icon familiarity and logo anthropomorphism. Each of these constructs has four items. We measure logo-self connection with an eight-item scale adapted from Escalas and Bettman (2005). The perceived functional performance measure uses a two-item scale adapted from Park et al. (2013). All items except for logo anthropomorphism and perceived functional performance were measured using the 7-point Likert scale, with "strongly disagree" (1) and "strongly agree" (7) as anchor points. Logo

anthropomorphism and perceived functional performance were measured using a 7-point scale with “not at all” (1) and “very much” (7) as anchor points (see table 1). We include age and gender in our empirical model as control variables for logo anthropomorphism and logo-self connection. For the inclusion of the age variable, we reasoned older respondents might be more familiar with the instrument we used (the classic image of Sherlock Holmes) than younger respondents. The reason for controlling for the effect of gender was motivated by previous research that showed that consumers will form a positive evaluation toward an anthropomorphised object if the object is congruent with their gender: gender-schema congruity (Van den Hende and Mugge 2014). As Sherlock Holmes is a male iconic character, we expect that the instrument will be more favourable to male respondents than to female respondents.

----- Insert Table 1 here ----

3.4 Assessment of measures

We conducted a confirmatory factor analysis using the R package lavaan (Rosseel 2012) to assess the psychometric properties of each construct and evaluate their discriminant and convergent validity. The CFA model shows a good fit to the data ($\chi 2$ = 367.037; df = 170; RMSEA = 0.054, SRMR = 0.060, CFI = 0.970, TLI = 0.964). Table 1 shows the standardized factor loadings, composite reliability and the average variance extracted for each construct. The results show that all measures exhibit strong internal validity: all standardized factor loadings exceeded the threshold of 0.5 (Bagozzi and Yi 2012), the composite reliability of all constructs surpasses the threshold of 0.70 (Fornell and Larcker 1981). We examined the convergent validity of each construct by assessing the Average Variance Extracted (AVE),

which indicates that all constructs have a higher AVE than the benchmark of 0.5. We examined the discriminant validity of each construct by assessing the square root of the AVE, which indicates that the AVE of each construct was greater than all corresponding correlations (Fornell and Larcker, 1981): see Table 2.

We used the same sample where respondents were presented with a questionnaire that included items measuring all constructs in the model. Therefore, these constructs may share systematic covariance and potentially induce a common method variance (CMV) in the data, which could threaten the validity of our results (Podsakoff, MacKenzie, and Podsakoff, 2012). We used non-statistical and statistical approach to address CMV. For the non-statistical approach, we ensure confidentiality to respondents (Podsakoff, 2003), insert reverse-coded questions, and use response labels that are varied across some questions (Stremersch, Winer, and Camacho 2021)). We also conduct a pre-test of the questionnaire with two marketing experts and five members of public.

For the statistical approach of addressing CMV, we applied the CFA (Confirmatory Factor Analysis) latent marker variable approach as suggested by Williams, Hartman, and Cavazotte (2010) by including the items that have low and non-significant correlation with other items in the model as the marker variable in our CFA model. The CFA latent marker variable approach has several advantages over other popular methods such as the partial correlation with marker variable approach of Lindell and Whitney (2001). The common variance is controlled at items level, it applies statistical model comparisons to assess method bias, and it allows for an assessment of whether common variance affects all items equally or not (Podsakoff, MacKenzie, and Podsakoff 2012). Inspection of our data found that the correlation between the three marker variable items with other items of the substantial

constructs in the model were very low (correlations among composite scores are also very low, $r < 0.08$), which satisfies the requirement of the construct as a marker variable. Next, using R package lavaan (Rosseel 2012), we estimate different CFA models following the procedure explained in William's et al, (2010): CFA model with latent marker construct, Baseline model, Model C, Model U, and Model R. The Baseline model is a CFA model with a latent marker construct that is set to be orthogonal or uncorrelated to other substantive constructs and with fixed factor loadings and fixed error variances whose values were obtained from the original CFA model with the marker latent construct. Model C is similar to the Baseline CFA model with the addition that all items of the substantive constructs were loaded onto the marker latent construct and their factor loadings are set to be fixed. Model U is similar to model C with the loadings of the marker latent construct to items of the substantive constructs were allowed to be freely estimated. Finally, model R is similar to Model C where the correlations among the substantive constructs were fixed to be equal to correlations obtained from the Baseline model. Conducting a series of Chi-square difference test, we found that model C is the best model. Inspecting the factor loadings of latent market construct with items of substantive constructs, results show that the standardized loadings are very low, i.e., ranging from 0.04 to 0.08. Thus, despite this result there is evidence of method effect, but the effect is extremely low. Overall, we are confident that the potential bias due to CMV in our data is negligible.

----- Insert Table 2 here ----

4 Findings

4.1 Demographics

Our respondents are UK residents. In total, we have 404 respondents (mean age = 35.2, S.D. age = 13.2; 77% female, 22.3% male, 7% rather not say; 35.9% have a bachelor's degree for their highest education level). Each of the respondents took around 10-20 minutes to complete our questionnaire.

4.2 Hypotheses testing

We use the R package lavaan (Rosseel, 2012) to test our hypotheses. In our SEM model, we include a latent interaction factor by using a product-indicator approach to estimate the interaction effect between logo anthropomorphism and logo aesthetic appeal. We used the unconstrained approach proposed by Marsh, Wen, and Hau (2004). The unconstrained approach assumed that the component of the latent interaction factors (i.e., logo anthropomorphism and logo aesthetic appeal) are jointly distributed according to a multivariate normal distribution and the distribution of the product of the latent factors is non-normal. Unlike the constrained approach (e.g., Jöreskog et al. (1996), the unconstrained approach does not require nonlinear constraints, therefore it is easier to use. As the moderation effect can be spurious due to the potential presence of quadratic effects (Lubinski and Humphreys 1990; Daryanto 2019), we also include two quadratic latent factors in the model with their respective items. Items for the interaction and quadratic factors were created by applying the matched-paired cross-product indicator strategy as proposed by Marsh, Wen, and Hau (2004). That is, we take the product of items from each of the latent factors to create items of the latent interaction and quadratic terms. For example, if A1, A2, A3 are items of logo aesthetic appeal, then the squared of the indicators (i.e., $A1^2$, $A2^2$, and $A3^2$) serve as indicators of the latent factor of squared logo aesthetic appeal.

The results show that the model indices give a good fit of data to the model ($\chi 2$ = 1124.357; df = 563; RMSEA = 0.054; SRMR = 0.10; CFI = 0.941; TLI = 0.931). Our results are presented in table 3.

----- Insert Table 3 here ----

Logo association has a positive impact on logo anthropomorphism (LAS → LAN; b = 0.27, t = 3.78, p < 0.001), whereas the impact of icon familiarity on logo anthropomorphism was not significant (ICF → LAN; b = 0.02, t = 0.41, n.s): it is positively correlated with logo association (b = 0.27, t = 4.52, p < 0.001), confirming H1 and disconfirming H2. Logo anthropomorphism has a positive impact on logo-self connection (LAN → LSC; b = 0.44, t = 8.78, p < 0.001) and perceived functional performance (LAN → PFP; b = 0.27, t = 5. 14, p < 0.001), confirming H3a and H3b, respectively. Next, Logo-self connection has a positive impact on perceived functional performance (LSC → PFP; b = 0.26, t = 4. 53, p < 0.001).

Logo aesthetic appeal has a positive impact on logo-self connection (AES → LSC; b = 0.20; t = 6.68, p < 0.001) and on perceived functional performance (AES → PFP; b = 0.28; t = 8.59, p < 0.001), confirming H4a and H4b, respectively. None of the effect of the control variables of age and gender on both logo anthropomorphism and logo-self connection are significant. Regarding the interaction effect, despite controlling for the quadratic term, the interaction effect is significant (LAN × AES → LSC; b = 0.15, t = 3.55, p < 0.001). This means that the significant effect found is not spurious. Examining the sign of the positive main effect and positive interaction effect, the result suggests that the effect of logo anthropomorphism on logo-self connection is greater as logo aesthetic appeal increases, confirming H5.

To explore the effect of logo anthropomorphism further, we test the mediation effect of logo self-connection on the relationship between logo anthropomorphism and perceived functional performance (LAN → LSC →PFP), we perform indirect effect tests using R package lavaan (Rosseel, 2012) with 5000 bootstrap samples. The bootstrap procedure is now regarded as a standard procedure to test the mediation effect because the sampling distribution of the indirect effects need not to be normal (Shrout and Bolger 2002). The results of the mediation effect analysis, presented in Table 3, show the unstandardized estimates of the indirect effects and the lower bound and upper bound of the 95% bias-corrected confidence intervals. The results suggest that, albeit small, logo-self connection mediates the effect of logo anthropomorphism on perceived functional performance (b = 0.11, CI: 0.07, 0.18).

5 General discussion

Our research results support all hypotheses except H2. We found that logo anthropomorphism is positively related to consumer logo association but is not affected by the extent to which consumers are familiar with the iconic familiarity used in the logo. Logo anthropomorphism has a positive impact on logo-self connection, which in turn affects perceived functional performance. In this case the perceived functional performance of a service. As a novel concept, we hope that logo anthropomorphism will contribute to the further development of the brand anthropomorphism literature and encourage future research in this area.

5.1 Theoretical implications

This research makes three theoretical contributions. First, we conceptualize logo anthropomorphism and empirically show that it has a positive impact on perceived

performance appeal. Second, we found that logo association serves as an antecedent of logo anthropomorphism: logo association, while logo icon familiarity does not. Third, we identify the mechanisms through which logo anthropomorphism affects performance.

By introducing a novel construct of logo anthropomorphism this research contributes to the growing body of literature on brand anthropomorphism. Despite the growing volume of research on brand anthropomorphism there is a lack of agreement surrounding the measurement of its effects on consumer behaviour: some research has found positive effects (Aggarwal and McGill 2007; Delgado-Ballester, Palazón, and Peláez 2019; Rauschnabel and Ahuvia 2014), other research has found negative effects (Puzakova, Rocereto, and Kwak 2013; Kwak, Puzakova, and Rocereto 2015). Our research provides new insights to the testing of anthropomorphism in this context. This research empirically tests the idea that brand logos facilitate consumers' brand connection. That is, how consumers connect their self-concept with the brand. Hence, we introduce the concept logo-self connection. The research findings suggest that logo association and logo anthropomorphism are two variables that impact on how consumers develop logo-self connection.

We identify the antecedents of logo anthropomorphism: logo association and logo icon familiarity. Despite logo icon familiarity not being significant, we found that consumers can connect to a brand in a meaningful way through a brand logo, where consumers perceive the brand logo to have iconic socio-cultural associations (a logo with the silhouette of Sherlock Holmes) and humanlike characteristics. Under these conditions, consumers were more likely to connect their self-concept with the brand logo. However, despite logo association and icon familiarity being positively correlated, icon-familiarity does not have a direct impact on logo anthropomorphism; this is, statistically represented by the non-significant direct path from icon familiarity to logo anthropomorphism. This result suggests that being familiar with the iconic

character *per se* (for example, “I have seen Sherlock Holmes films”) has no direct role in the reinforcement of logo anthropomorphism. Rather, consumers connect the iconic character to brand logo association.

Our research findings agree with previous research by Park, Eisingerich, and Pol (2014), that a brand logo can create a connection between the brand and its consumers. We offer two explanations for this. First, when the brand logo contains an iconic character, this association allowed consumers to perceive the brand logo as socio-culturally embedded. Our research found that by imbuing the brand logo with the associations of an iconic character, consumers perceived the design of the brand logo as socio-culturally functional. Holt and Holt (2004) suggests that having an iconic element in a brand is important, because it associates a brand with cultural identity myths that can transform into imaginative resources that the consumer can use to build their own identity. Second, as Duffy (2014) suggests, by featuring humanlike characteristics in the brand logo, it is possible to create character beings rather than emblematic portraitures. In our research, respondents perceived the anthropomorphised brand logo as a living entity, with a mind of its own, the ability to experience emotion, and give the appearance of consciousness; thereby, echoing research in social psychology (Epley, Waytz, and Cacioppo 2007), which explains how humans try to find social connection through anthropomorphising.

We identify the mechanisms through which logo anthropomorphism affects performance. Our research shows logo association and logo anthropomorphism positively effect perceived functional performance. In other words, the more the consumer perceives the brand logo as having an iconic character associated with it, the more the consumer will perceive the brand logo as having humanlike characteristics, and as a result the brand logo appears more

appealing to the consumer. Hence the brand logo with an iconic character design, derives ownership of symbolic meaning. This symbolic meaning is associated with the values, ideals, needs and aspirations (Torelli et al. 2009) (Torelli, Chiu, Keh and Amaral, 2009). Our research shows that designing the brand logo with a Sherlock Holmes association affects how consumers perceive brand performance.

5.2 Managerial Implications

By decoupling the construct of logo anthropomorphism from the broader concept of brand anthropomorphism this research has several implications for the management of the brand. The first two implications identify opportunities for managers, the second two implications identify threats implicit in the use of culturally embedded anthropomorphic characters.

First, because logos are both mutable and independent of product designs in a way that brands themselves are not, logo anthropomorphism facilitates a more flexible management response to changes in consumer self-concepts. This research shows that anthropomorphic logos through the mechanism of logo-self connection enhance perceptions of performance appeal.

Therefore, managers are able to transmute logo characteristics to suit changing conditions, just as they might be able to respond to shifts in social conditions through the modification of other brand elements such as brand mantras. However, the degree of flexibility available to them is limited over time. Too much change and the role of the logo is diminished, too little change and the logo becomes archaic. Both result in a disconnection with the logo as it moves away from consumer self-concepts.

Second, given our findings on the role of logo association, anthropomorphic logos offer managers the opportunity to enhance brand aura in response to changes in societal norms without abandoning socio-cultural associations embedded in familiar iconic imagery. An active commercial example of this would be the way in which the insurance company Admiral was able to respond to changes in societal norms through the re-gendering of its iconic familiar and socio-culturally embedded Nelsonian logo.

Here again managers should be sensitive to the socio-cultural range within which they work. While there may be shifts that require modification because logos come to contradict fundamental discontinuities in dominant value systems, opportunities for change will usually arise from evolutionary rather revolutionary change. Indeed, by their nature, logos predicated on socio-cultural associations operate on a basis of continuity rather than discontinuity.

Third, the research reported here shows that the flexibility discussed in the second point in this section is only present where the anthropomorphic logo remains associated with the core iconography of the brand. That is, the logo may be creatively stretched to encompass socially relevant norms associated with emergent manifestations of consumer logo-self connection; however, it should only do so within a discursive framework that speaks to the authentic values of the brand.

This would suggest that the anthropomorphic logo provides managers with a flexible response to changing norms associated with self-connection, but as an element of the brand the re-manifestation of the logo cannot be empowered to move beyond core brand values. Therefore, where brands are being repositioned managers have an opportunity to

fundamentally rethink logo design and meaning. However, where core brand values are immutable, logo reenvisaging should maintain valued heritage features and sustain authentic qualities.

Fourth, consumers judge a logo by its attractiveness. Our significant finding on the moderation effect of logo anthropomorphism and logo appeal on logo-self connection suggests that managers have an opportunity to build attractiveness through anthropomorphising a brand logo. However, inappropriately anthropomorphising a brand logo may, by implication, prove counterproductive. An unattractive anthropomorphic logo may lead to the deformation of logo-self connection. The antecedents of logo anthropomorphism will be particularly important where the proposed anthropomorphised logo draws on cultural or iconic associations. These associations may be different by market or generational cohort and therefore will require appropriate pre-testing.

Therefore, managers should build elements into market research that monitor consumer response to logo cultural applicability. Socio-cultural relevance to different stakeholder groups is particularly important in societies and at times where social change is prevalent. Whereas, in societies, or at times, where homogenising social forces are predominant, continuity of representation is both advisable, feasible and preferable. The mutable qualities of the logo provide opportunities for change but these same qualities also require careful management.

5.3 Limitations

Two points regarding the generalizability of the results are worth discussing. First, the stimuli we used in the study are specific (Sherlock Holmes character). This raises the question: are the results generalizable to a logo simply imbued with human characteristics? We believe that by

using a neutral character which cannot be associated with an existing or iconic character in a popular culture, the core relationships in the model without the existing antecedents will still be valid in describing how logo anthropomorphism affects brand performance.

Second, we do not include a measure of individual differences in consumers' tendency to anthropomorphise an object (see Waytz, Cacioppo, and Epley 2010). One may argue that the inclusion is necessary to control for the effect of this personality trait on substantive constructs and relationships in the model, especially logo anthropomorphism. The reason for this exclusion is that the anthropomorphic logo can serve as a prime; that is, on seeing the logo, the anthropomorphic tendency is accessible and activated. According to Higgins (2000), priming and chronic accessibility (trait) can have similar effects on judgments and behaviours. For this reason, studies that prime participants with an object to activate a certain construct do not measure personality trait (e.g., Higgins 2000). We follow this logic. If we measure anthropomorphic tendency in a single cross-sectional study prior to the presentation of the anthropomorphic logo, the personality trait items can themselves act as a prime that will affect the variance in logo anthropomorphism. Furthermore, items used to measure logo anthropomorphism in our study will be highly correlated or overlap with items measuring individual's tendency to anthropomorphise.

5.4 Future directions

Given the lack of agreement on the direction of the effects of brand anthropomorphism on consumer behaviour explained in the previous section, we suggest that further research on logo anthropomorphism may advance research in this area. Our research on logo anthropomorphism found associations made by the consumer based on a familiar socio-culturally embedded iconic character establishes logo-self connection, and positively affects perceived functional

performance. We therefore suggest that this novel concept of logo anthropomorphism may encourage further research and contribute to the development of the literature on brand anthropomorphism.

The research presented here focuses on logo anthropomorphism, which has been neglected in the branding literature. To initiate research in this area we chose to use a hypothetical brand. Further research might consider using a logo from an existing brand. This would provide an opportunity to explore wider and more nuanced associations and iconography. While we chose a brand associated with financial services, future research might consider logos from other product categories. Further research could extend our work using a human character by extending the range of anthropomorphic characteristics. While we have used a static character, future research could investigate the effect of animated logos. On an international level, future research would benefit from consideration of consumers from distinct cultural environments. Research has shown that culture affects consumers' tendencies to anthropomorphise a brand; for example, Ghuman et al. (2015) found that Chinese consumers and Indian consumers have a higher tendency to anthropomorphise brands compared to US consumers. Cross-cultural research might thereby shed light on the effect of cultural predispositions on logo anthropomorphism.

Declarations

Conflict of interest. On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Fig 1. Research framework.

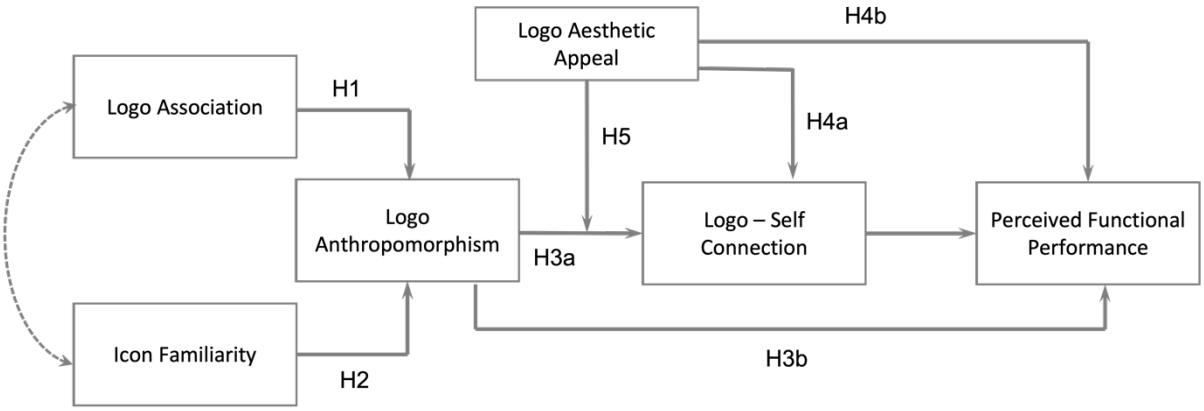

Figure 2. Logo used in the study

Table 1. Measurement model

Constructs/Items	loadings
Logo association (CR = 0.89; α = 0.90; AVE = 0. 67)	
When I see PriceInvestigate.com's logo it reminds me of Sherlock Holmes the fictional detective character.	0.85
When I see PriceInvestigate.com's logo I can easily imagine the Sherlock Holmes character.	0.86
I associate Sherlock Holmes with the PriceInvestigate.com's logo.	0.72
I am aware the logo reminds me of Sherlock Holmes.	0.91
Logo anthropomorphism (CR = 0.89; α = 0.85; AVE = 0.6)	
In my mind, PriceInvestigate.com's logo has come alive (like a person).	0.74
It almost seems as if the PriceInvestigate.com logo has a mind of its own.	0.83
PriceInvestigate.com logo appears to have the ability to experience emotions.	0.84
PriceInvestigate.com logo appears to have consciousness.	0.83
Logo-self connections (CR = 0.95; α = 0.97; AVE = 0.63)	
PriceInvestigate.com's logo reflects who I am.	0.83
I can identify myself with PriceInvestigate.com's logo.	0.85
I feel personal connection to PriceInvestigate.com's logo.	0.88
I use PriceInvestigate.com's logo to communicate who I am to other people.	0.87
I think PriceInvestigate.com's logo helps me become the type of person I want to be.	0.89
I consider PriceInvestigate.com's logo to be "me".	0.89
I consider PriceInvestigate.com's logo to reflect who I consider myself to be.	0.92
I consider PriceInvestigate.com's logo to reflect the way I want to present myself to others.	0.91
*Perceived functional performance * (CR = 0.76; α = 0.77; AVE= 0.78)*	
The logo conveys the service performance I can expect from PriceInvestigate.com.	0.73
The logo assures me that PriceInvestigate.com will assist me in handling my daily life competently.	0.85
Icon familiarity (CR = 0.83; α = 0.83; AVE = 0.67)	
I have seen Sherlock Holmes films.	0.86
I am a fan of the fictional character of Sherlock Holmes.	0.84
I am familiar with the fictional character of Sherlock Holmes.	0.69
Aesthetic appeal (CR = 0.90; α = 0.90; AVE = 0.77)	
PriceInvestigate.com's logo is aesthetically (visually) pleasing to me.	0.96
PriceInvestigate.com's logo provides aesthetic (visual) pleasure to me.	0.93
PriceInvestigate.com's logo is not aesthetically (visually) appealing to me. (r)	0.74

Notes: CR = Composite reliability; α = Cronbach's alpha; AVE = average variance extracted; values for loadings are standardized loadings. *These items were measured using 7 points scales, where 1 = Not at all, and 7 = Very much. CFA model fit: $\chi 2$=367.037; df =170; RMSEA = 0.054, SRMR = 0.060, CFI = 0.970, TLI = 0.964.

Table 2. Latent construct correlations

Construct	Mean	SD	1.	2.	3.	4.	5.	6.
1. Perceived functional performance	3.71	1.42	**0.80**					
2. Logo association	5.51	1.22	0.22	**0.82**				
3. Logo anthropomorphism	2.97	1.43	0.67	0.24	**0.81**			
4. Logo - self connection	2.29	1.26	0.64	0.10	0.62	**0.88**		
5. Icon familiarity	5.09	1.55	0.15	0.27	0.05	0.16	**0.82**	
6. Logo aesthetic appeal	3.80	1.72	0.58	0.35	0.46	0.46	**0.21**	**0.87**

Note: Values in main diagonal are the square root of the average variance extracted (AVE).

Table 3. Results of SEM model

Hypothesis	Relationship	b	t-value	Result
	Control:			
	Gender → LAN	-0.11	-0.84	
	Gender → LSC	0.14	1.42	
	Age → LAN	-0.01	-1.74	
	Age → LSC	0.01	0.35	
	AES^2 → LSC	-0.08	-3.21 ***	
	LAN^2 → LSC	0.01	0.75	
	Main effect			
H1	LAS → LAN	0.27	3.78***	Supported
H2	ICF → LAN	0.02	0.41	n.s.
H3a	LAN → LSC	0.44	8.78***	Supported
H3b	LAN → PFP	0.27	5.14***	Supported
	LSC → PFP	0.26	4.53***	Supported
H4a	AES → LSC	0.20	6.68***	Supported
H4b	AES → PFP	0.28	8.59***	Supported
	Mediation effect			
	LAN → LSC → PFP	0.11	95%CI: 0.07; 0.18	Supported
	Interaction effect			
H5	LAN × AES → LSC	0.15	3.55***	Supported

Note: *** $p < 0.001$; Unstandardized estimates; LAN = Logo anthropomorphism; LAS = Logo association; LSC = Logo-self connection; ICF = Icon familiarity; AES = Logo aesthetic appeal; PFP = Perceived functional performance; For testing mediation effect, bootstrap samples = 5000, 95% CI is the bias-corrected confidence intervals; SEM fit indices: $\chi 2 = 1124.357$; df = 563; SRMR = 0.10, RMSEA = 0.054; CFI = 0.941; TLI = 0.931.