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Brand preference affects the threshold for perceptual awareness

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ABSTRACT

Despite decades of scientific scrutiny, much is still unknown about the effects that brands have on perception. Brands are known to lead to changes in attention and mnemonic processing and by altering emotional preferences they imbue products with value. Less, however, is known about the exact mechanism through which this occurs. Here, a novel and unexpected finding is provided in which subjective brand preference alters the likelihood that a brand name will be consciously seen. By presenting brand names at brief durations, and having them respond using a graded evaluation of conscious perception, the Perception Awareness Scale, it is found that brand names for which there is either a positive and negative preference, subjects report seeing the name more clearly. Interestingly, and much to the contrary of studies of basic emotions, this effect is strongest for positive preference. Our results are discussed in light of other studies in consumer psychology and consciousness science. Copyright © 2013 John Wiley & Sons, Ltd.

The basic ambition of using a brand is to distinguish a product or service positively from other competing products. Thus, through branding efforts, brand managers hope to get consumers to identify the product with a specific identity, to influence the consumers' ability to recall and recognize the product (among other products), and to associate the product with qualities that are positively perceived (Wänke *et al*., 2007; Plassmann *et al*., 2012). To accomplish these goals, brands must engage a larger number of our mental systems, including perception and awareness, memory and cognition, and emotion.

Exactly how all these complex systems come together to make brands work their magic remains obscure. One important aspect of brand psychology that has recently started to come under scrutiny is the study of the mechanisms of why brands are able to modulate the subjective value of an object. It is well known that brands hold the ability to influence how the consumer values a product. For instance, consumers report that the same physical drink tastes better if they are told it is a specific beer brand than if they drink it without this knowledge (Allison and Uhl, 1964), and they display a willingness to pay significantly higher prices for original labels than for identical knock-offs. In other words, a brand can enhance a consumer's preference for, and perhaps even hedonic experience of (Ariely and Norton, 2009; Ariely and Berns, 2010), a product *beyond* its physical properties. Even with exact copies, being associated with a brand can make a consumer value one object over the other item that is not associated with the brand. Thus, brands "infuse" value into the product, as it were.

In studying these mental effects, neuroimaging studies have gone some way to identify the brain regions involved in processing brand value. For example, in a seminal paper, McClure *et al*. (2004) showed that when subjects drink an identical liquid and were told on some trials that they were drinking Coca Cola and other trials that they were drinking Pepsi Cola, the impression that they were drinking Coca Cola led the subjects not only to rate the taste of the liquid as more pleasant but also produced enhanced neural activity in regions involved in memory and attention (hippocampus and dorsolateral prefrontal cortex). When not receiving brand information, subjective ratings of taste pleasure were positively related to activation in the orbitofrontal cortex (OFC). Similarly, in a functional Magnetic Resonance Imaging study Kirk *et al*. (2009) led subjects to believe that abstract paintings were either from a prestigious art museum in Denmark, or not. Again, a positive bias in rating for paintings associated with the "art gallery" paintings corresponded to stronger brain activity in the OFC, as compared with paintings not associated with such brand information.

Yet, knowing which anatomical regions of the brain that underlie brand valuation does not in itself explain *why* a brand may modulate the perceived value of an object. Presumably, learned and memorized associations of the brand elicit positive or negative predictions of how pleasant the object will be, something that has been shown possible to occur unconsciously (Pessiglione *et al*., 2008) influencing the neural processes involved in computing the actual experienced value of the object (Plassmann *et al*., 2008; Santos *et al*., 2011).

In terms of consumer responses to brands, at least two processes are at play. On the one hand, overt experiences of brand value are reflected in verbal reports and are reflected in the specific engagement of the OFC, and as such denote what we here call the "feelings" accompanying the perception of a brand (Plassmann *et al*., 2012). On the other hand, as with abstract symbols, brands may lead to automatic behavioral and physiological responses that occur without accompanying awareness, yet nevertheless may affect subsequent processing of brand-related information, even in the absence of awareness (Pessiglione *et al*., 2008), which we here call "emotions." What lies at the very borderline between unconscious emotions and conscious feelings is the subject of this paper.

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Preferences and visual perception

Knowing that brands carry value, that this value can infuse the product the brand gets associated with, and that a specific "hedonic" brain region – the OFC (Rolls, 2000; O'Doherty *et al*., 2001; Plassmann *et al*., 2010; Grabenhorst and Rolls, 2011) – plays an important role in this process, which raises a number of interesting new questions. Specifically, since recent studies have demonstrated an interconnection between affective processing and consciousness (e.g. Thomsen *et al*., 2011) and that brands have been shown to be able to modulate affective processing in the brain, one may wonder if brand value also holds the ability to affect how a product is consciously perceived. The argument would thus be the following: (1) At the individual level, a brand becomes associated with a particular value, a learning that can both have conscious and unconscious elements. (2) Seeing a physical representation of the brand, be it the brand name, a brand logo, or some other brand representation, evokes this value by influencing the brain's affective system. Notably, even unconscious presentation of the brand can evoke such responses. (3) The evoked affective value modulates the perceptual processing of whatever object the brand is associated with, including visual mechanisms involved in making a percept conscious.

From studies on the effects of basic emotions, the subjective valence of an object is known to affect both perceptual processing and behavioral responses (Öhman and Mineka, 2001). Compared with neutral stimuli, more attentional resources are allocated to the perceptual computation of emotional, especially negative, objects (Algom *et al*., 2004; Estes and Verges, 2008). The result is an increase in detection accuracy (Nasrallah *et al*., 2009). Furthermore, neuroimaging research has demonstrated that this difference in how emotionally relevant stimuli are processed, is associated with a difference in neural activation of structures involved in perceptual processing (Lang *et al*., 1998; Lane *et al*., 1999; Mourão-Miranda *et al*., 2003).

Reward expectancy and other emotions, in turn, are known to regulate attention. Studies in psychology and cognitive neuroscience have demonstrated alterations in attention to visual objects following operant and classical conditioning (Platt and Glimcher, 1999; Glimcher, 2003; Dorris and Glimcher, 2004; Sugrue *et al*., 2004). Recently, Serences (2008) demonstrated that, in the absence of changes in overt eye movements, stimuli with a reward history produced stronger engagement of the visual systems of the brain, as indexed by functional Magnetic Resonance Imaging. Indeed, one plausible and empirically supported view is that regions involved in emotion and saliency, such as the amygdala, can affect sensory processing through top-down attentional modulation (e.g. Vuilleumier *et al*., 2004).

Why would there be this interaction between subjective value, affect, and perceptual processing? The effect of stimulus valence on perceptual processing is probably rooted in the evolutionary benefit of having sensory information processing guided by biological relevance (Vuilleumier, 2005). Although the exact anatomical and functional relation between the neural processes involved in visual perception and emotion remains unclear (Pessoa and Adolphs, 2010), perceptual factors associated with biological relevance such as saliency or predictability have been shown to directly influence activity in brain regions such as the amygdala, and correlate with avoidance-prone behavior (Herry *et al*., 2007), just as amygdala activity induced by fearful faces has been shown to modulate neural activity in early visual cortex (Vuilleumier *et al*., 2004).

Advantages of conscious processing

As the review of the relationship between emotional processing and perception shows, it is biologically possible that brand preference could influence how brands themselves or objects associated with the brand are consciously perceived. But what, if true, would the implication of this be?

Consciousness research during the past several decades has demonstrated several significant cognitive differences between conscious and unconscious processing. One of the main findings emerging from this research is that unconscious processes exhibit a limited and rigid information processing capacity, make use of specialized processors, and exert little effect on overall thinking and action (Baars, 2002; Baars *et al*., 2003; Shanahan and Baars, 2005). By contrast, conscious processes are associated with a large and flexible information processing capacity, make use of dynamic processors, and exert a much larger effect on thinking and behavior (Baars, 2002). In other words, whether a stimulus is consciously seen or not has a tremendous influence on the effects it can have on thinking and behavior. Although there is robust evidence showing that subliminal perception – stimuli processed by the sensory system but not consciously experienced – can influence thoughts, feelings and actions (Wänke *et al*., 2007; Chartrand *et al*., 2008) – consciously perceived information enables a much stronger effect on flexible and creative behaviors (Shanahan and Baars, 2005).

As a consequence, stimuli that reach consciousness are more likely to affect behaviors relevant to consumer decisions, including memory, preference, and decision making. In the informationally crowded environment of today's product and media landscapes, only a fraction of the stimuli being processed by the perceptual system gains full access to consciousness and the benefits of such process. Hence, understanding the factors and mechanisms responsible for whether or not a given stimulus obtains access to consciousness is of great value for our understanding of consumer psychology, as well as providing a better insight into the relationship between preference and awareness.

Here, evidence is presented in which the likelihood that a stimulus becomes conscious depends upon how much it is subjectively preferred. Using an influential and validated measure of consciousness, the Perception Awareness Scale (Ramsøy and Overgaard, 2004; Christensen *et al*., 2006; Overgaard *et al*., 2006; Sandberg *et al*., 2010), we find that that the threshold for conscious processing of a stimulus is affected by the individual level of preference for the stimulus being briefly displayed.

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Hypotheses

The current knowledge about the effects of preference on consciousness stems from work performed on the stimuli with a direct emotional value and is the only source of prior knowledge from which one can base experimental hypotheses. On the basis of the aforementioned studies (Öhman and Mineka, 2001; Dijksterhuis and Aarts, 2003), two hypotheses were proposed.

> *Hypothesis 1:* Brand names for which the subject have either a positive or a negative preference have a higher likelihood of being consciously perceived, compared with brands for which the subject has a neutral preference.

This hypothesis stresses the general idea that emotional stimuli, through their regulatory effect on attention, are more likely to gain access to conscious processing. Here, this insight is extended by testing whether stimuli for which a subject has a specific positive or negative preference, will also produce a preconscious attention response that leads to an increased likelihood for conscious experience of the stimulus. Notably, in the study by Dijksterhuis and Aarts (2003), there was no neutral condition to test whether positive stimuli were more easily perceived than neutral ones. Hence, a neutral condition – brand names for which the subject is indifferent – was employed to test the main hypothesis.

This leads to the second hypothesis. On the one hand, the recent report that negative stimuli were more easily detected than stimuli words (Dijksterhuis and Aarts, 2003) leads us to expect that a similar effect is present for brand preference:

> *Hypothesis 2:* Brands for which subjects have a negative preference (dislike) are more likely to be consciously seen than brands that the subject has a positive preference (like).

However, two facts make an alternate hypothesis equally plausible. First, studies have suggested that positive preference may indeed be related to a stronger effect on visual attention than negative preference. For example, Serences (2008) reported a positive bias in the effect of reward history on neural activation related to visual attention. More specifically, there was a significant effect of selected (i.e. positive preference) compared with unselected (i.e. negative preference) items on such visual activation. Second, using preferences such as brands may rely on different processing mechanisms not comparable with basic emotional cues such as snakes, spiders, or facial expressions. Hence, the alternative hypothesis that should be considered as equally probable is that there is no difference between positive and negative preferences, or even that positive preference exerts a stronger effect than negative preference, on conscious detection.

METHOD

To this end, 49 subjects (age mean/*std* = 25.7/2.7, 26 women, and 46 right handed) were recruited from the region of Copenhagen, Denmark. Subjects signed an informed consent and were positioned in front of a computer monitor (the distance was approximately 60 cm; the screen type was a cathode ray tube screen running at 75 Hz to ensure brief stimulus presentation). First, each subject underwent a brand rating test in which they were sequentially shown brand names on-screen and were asked to rate their brand preference using a 7-point scale (1 = strongly dislike, 7 = strongly like), and a second 7-point scale rating for their knowledge of the brand (1 = do not know, 7 = know very well). In all, each subject rated 104 brand names by pressing the numeric buttons on a keyboard in a self-paced manner. The brand names were selected on the basis of two criteria: first, they should be among the most prominent brands available in Denmark (taken from a national list of the most prominent Danish brands); and second, the brand names should be approximately at the same length (4–9 characters) to avoid systematic differences in visual masking of these stimuli. To maximize statistical power and reduce individual variance in scoring, the two most positive (6–7) and most negative (1–2) liking scores were collapsed into single categorical scores of positive and negative brand liking, respectively, and used these scores in the statistical analyses. A score of 4 was used as the neutral brand preference.

Subjects were instructed that in the following test, they would be shown different brand names at different durations and that their task was to report the perceived clarity of the brand name. Subjects were also told that there would be null events, but that their main task was to report the clarity of their perception by adhering to the Perception Awareness Scale (PAS) (Ramsøy and Overgaard, 2004). All brand names were presented multiple times and in pseudorandom order (randomized but avoiding the presentation of the same brand name two or three times in a row) for each subject. Each brand name was presented for approximately 13, 52, and 91 ms in a forward- and backward masking paradigm. Subjects reported the clarity of their visual experience of each name by using three of the possible responses of the PAS: having "no experience," a "vague experience," or a "clear experience" of the stimulus (Figure 1).

To analyze the effect of brand preference on conscious experience (PAS score), we ran an Ordinal Logistic Regression, using PAS score as the dependent variable, and with individual brand rating (positive, neutral, and negative) as an independent variable, and with brand knowledge and stimulus duration as additional regressors. Reaction times below 100 ms and above 5000 ms were excluded. Statistical analysis was performed in JMP version 9.0 (SAS Institute Inc.)

First, the main effect of brand preference rating on PAS scores was analyzed, with stimulus duration and knowledge scores as covariates. Second, the analysis was divided into separate duration times. In a post-hoc analysis, a more complex model was tested in which the interaction between duration and preference on PAS score was included.

RESULTS

The statistical analysis showed that the whole model was highly significant ($x^2 = 9558.6$, $R^2 = 0.316$, $p < 0.0001$). Looking at the individual effects, we find highly significant effect of brand preference on PAS scores ($x^2 = 8.5$,

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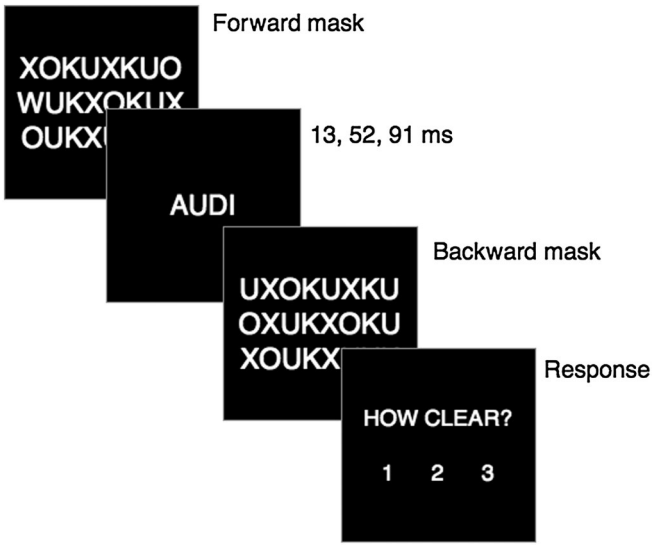

Figure 1. The experimental procedure. Subjects first saw a forward mask, followed by a brief presentation of the brand name for either 13, 52 or 91 ms. Following a backward mask, subjects were asked to rate the clarity of their experience using the Perception Awareness Scale.

$\beta = -0.036$, $p = 0.0036$). Additional effects were found for knowledge ($x^2 = 20.6$, $\beta = -0.054$, $p < 0.001$) and stimulus duration ($x^2 = 9549.6$, $\beta = -0.076$, $p < 0.0001$). As Figure 2A illustrates, the PAS effect was due to higher scores for positive and negative brand preference scores relative to neutral preference. A post-hoc analysis looking at nonlinear effects (2nd order polynomial) of preference on PAS judgements was found to provide a slightly better model ($x^2 = 13.5$, $\beta = -0.01$, $p = 0.0003$); thus, reflecting higher PAS scores for low and high preferences, relative to neutral preference.

To further probe this effect, the difference between positive, negative, and neutral individual brand preferences on PAS score was analyzed using direct comparisons. Here, the analysis demonstrated a significant difference between negative compared with neutral brand ratings ($x^2 = 31.1$, $p < 0.001$) and an even stronger effect for positive compared with neutral brand ratings ($x^2 = 129.5$, $p < 0.0001$). By directly comparing the effects of positive and negative brand ratings, it was found that positive brand ratings were associated with significantly higher PAS scores than negative brand ratings ($x^2 = 19.5$, $p = 0.013$).

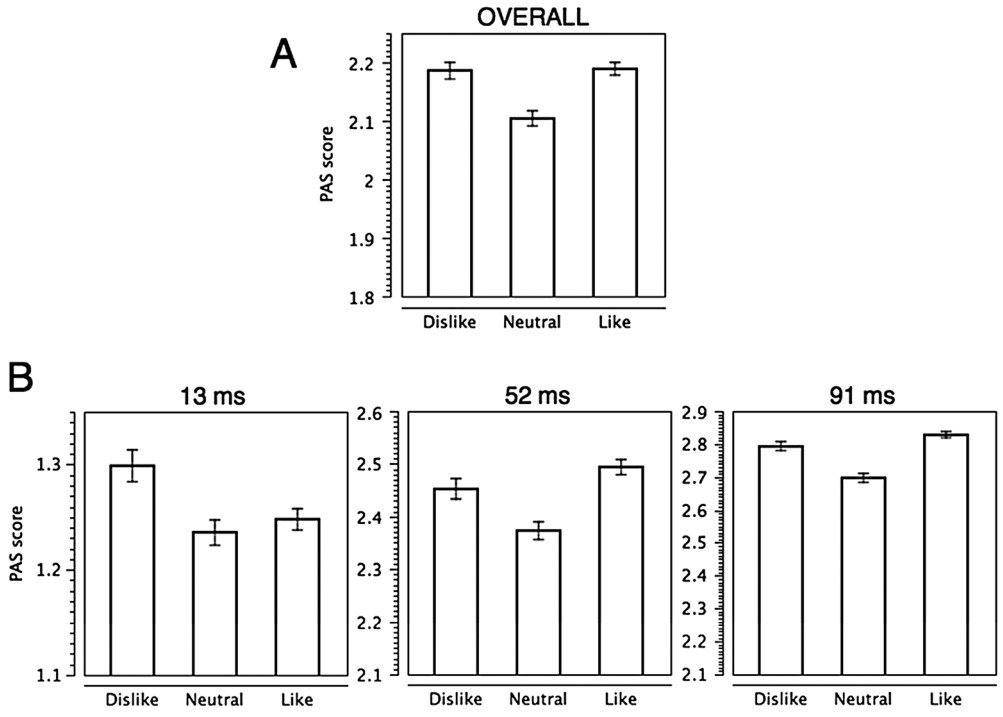

Figure 2. Effects of brand preference on Perception Awareness Scale (PAS) scores. The main effect (A) demonstrates that stimuli associated with either positive or negative preference are generally associated with higher PAS scores than brand names for which subjects are indifferent. Looking at these effects for each stimulus duration (B), the effects are most pronounced for 91 ms duration and not significant for the 13 ms condition. Bar charts showing mean value, whiskers denote confidence interval.

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A follow-up analysis was performed to look at the interaction between preference and stimulus duration on PAS scores, still modeling the main effects of preference and duration individually, and with knowledge as covariate. Here, we find that the model is highly significant ($x^2 = 9608.3$, $R^2 = 0.317$, $p < 0.0001$) and that in addition to the effects seen for duration, preference and knowledge, there is a preference duration interaction ($x^2 = 49.6$, $\beta < -0.01$, $p < 0.0001$). As seen in Figure 2B, at 13 ms negative preference was associated with higher PAS scores, whereas at 52 and 91 ms both positive and negative preferences were associated with higher PAS scores.

Collapsing the 52 and 91 ms presentations, direct comparisons between brand preferences demonstrated that both positive and negative brand preferences were related to significant higher PAS scores (positive: $x^2 = 88.5$, $p < 0.0001$; negative: $x^2 = 85.4$, $p < 0.0001$) when compared with neutral preference. Again, positive brand preference showed a significantly higher mean PAS score than negative preference ($x^2 = 88.5$, $p < 0.0001$).

General discussion

To our knowledge, this is the first study to show an effect of individual preference on the clarity of conscious perception. By using a forward- and backward masking paradigm with variable stimulus duration, and employing a sensitive measure to capture graded conscious perception, the results demonstrate a strong effect of individual brand preference on the detection and identification of briefly presented brand names. Notably, these results are distinct from the effects of brand knowledge and stimulus duration. In particular, brands for which subjects had either a positive or negative preference were more likely to be consciously perceived, compared with brands for which subjects had a more neutral relationship. This finding provides support for Hypothesis 1, and suggests that processes associated with computing the hedonic value of a stimulus influence the neural mechanisms mediating attention and ultimately conscious perception. Our results lend support to the notion that emotional processing plays an important role in the consciousness (Dijksterhuis and Aarts, 2003) and extends this notion by demonstrating that the effects hitherto found only for basic emotions can also be produced when using more complex and acquired emotional processes (i.e., subjective preferences).

Second, counter to our original a priori hypothesis, the data show that negative emotions are not more likely to provide access to consciousness than positive emotions. On the contrary, brands with a high positive preference (liking) were significantly more likely to be perceived consciously than brands with a low preference rating (disliking). Thus, Hypothesis 2 must be rejected. This result is at odds with previous studies using basic emotions (e.g., Öhman and Mineka, 2001; Dijksterhuis and Aarts, 2003; Gaillard *et al*., 2006) and warrants further examination and replication. As noted, this inconsistency may be related to at least two specific factors. First, the nature of the stimuli used in the present study is different when compared with other studies. Although earlier studies have employed stimuli associated with direct reward and punishment, the use of brand names for which there is individual and acquired preference represents a different level of processing. In other words, brands may engage the brain's valuation system differently than basic emotions and therefore produce different effects on attention and consciousness. Indeed, it may be possible that the effects seen here are more related to other psychological phenomena, such as the mere exposure effect (e.g., Janiszewski, 1993). This idea should be examined further in future studies. Second, and related to this, the recent study by Serences (2008) in which subjects underwent a value-based decision-making paradigm, it was found that stimuli with a positive reward history produced a stronger response in the visual system than stimuli with a negative reward history. As brand preference can indeed be seen as the result of an ongoing learning of brand-reward contingency, the results provided by Serences (2008) may indeed provide a plausible neurocognitive mechanism for which brand preference affects visual attention and, through this, conscious access. However, to fully embrace this hypothesis, more studies are needed.

Our results provide novel insights into the relationship between emotions and consciousness in consumer psychology. Studies of the brain bases of consciousness have often treated the threshold to consciousness as a stable variable and assumed that the threshold is unaffected by cognitive or emotional factors. Using the duration of stimulus presentation as the key variable has been dominant. Most studies have employed a cutoff at around 50 ms at which subjects start to report perceiving the stimulus (Ramsøy and Overgaard, 2004; Christensen *et al*., 2006; Overgaard *et al*., 2006; Kouider and Dehaene, 2007). Notably, theoretical accounts have suggested that consciousness is an all-or-none phenomenon caused by a neural bifurcation in which information changes from being processed locally (e.g. in the primary visual areas) to engaging a widespread brain network including thalamic, frontal, and parietal regions (Baars *et al*., 2003; Christensen *et al*., 2006). This view of consciousness has been used to suggest that information from one processor (e.g. vision) is temporarily given influence on a widespread network, often referred to a "global workspace" of the brain (Baars, 2002; Baars *et al*., 2003; Christensen *et al*., 2006), ultimately leading to an improved emotional and cognitive processing and larger effect on behavior.

It is thought that such neural globalization effects work by influencing other processes related to behavior. Indeed, a percept that becomes conscious is more likely to be acted upon (e.g. through approach or avoidance behaviors) than non-perceived information. In other words, conscious processing is suggested to have a stronger power on mental processes and behavior than subliminal processes. Although the literature consistently demonstrates an effect of subliminal processes on behavior, by far the strongest influence on behavior has been found through overt, conscious processing (Baars, 2002; Baars *et al*., 2003). Given this, the effect of emotion on the threshold to consciousness should also affect subsequent behavioral effects. As emotions work by affecting behavioral inclinations of withdrawal or approach behaviors, the added effect of subjective preference on the conscious

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threshold could increase the likelihood that the stimulus is detected, and hence, has an increased influence on psychological processes and behavior. Future research should build on our findings and directly compare the psychological and behavioral effects of conscious and unconscious brand perception.

We chose to use brands written in standardized letters to allow easier forward- and backward masking of the brands. This follows the tradition of consciousness research and psychology in which it has been found that the masking of divergent stimuli is more problematic (Kouider and Dupoux, 2004; Kouider *et al*., 2010). Moreover, our choice of simple text was to avoid additional differences between brands in color, fonts, and other variables that might explain the behavioral effects. Nevertheless, as recent studies have suggested that unconscious processing of abstract symbols can affect choice-related behaviors (Pessiglione *et al*., 2008); this suggests that forthcoming studies should seek to test whether simplified symbolic representations of brands may have the same, or even bigger, effects on the relationship between brand preference and conscious detection.

Furthermore, it should be noted that our approach could not be performed with more complex and brand-specific stimuli such as brand logos. As brand logos have several differences in terms of brightness, contrast, and color composition, there are two main difficulties in testing the threshold to consciousness with this method. First, the forward- and backward mask method used relies on the ability to make a composite mask that can mask the stimuli. With words using the same fonts, this can be carried out reliably. However, following the vast literature on visual masking (see for example Kouider and Dupoux, 2004; Pessiglione *et al*., 2008; Kouider *et al*., 2010), this is not possible when using different complex images, as the mask will not work sufficiently for all stimuli. Second, and following the same point, because of the visual properties of the logos themselves (brightness, contrast, color composition, etc.), some stimuli may be less successfully masked. This may thus elevate the possibility that the experimental design will be suboptimal and invalid. Taken together, our results are limited by the use of a single aspect of brands, that is, their names, and future studies should use alternative means to study the effect of brand preference on the threshold to consciousness.

It should also be noted that our results provide independent insights into the nature of consciousness. Several studies have argued against the dichotomous view of consciousness and studies suggest that subjects are neither fully conscious nor fully unconscious of a stimulus (Ramsøy and Overgaard, 2004; Christensen *et al*., 2006; Sandberg *et al*., 2010). Rather, studies in neuropsychology and experimental psychology have clearly demonstrated cases in which subjects or patients report having sensory experiences that cannot be classified as either clearly conscious or unconscious. Instead, there are instances in which the observer reports having vague, glimpse-like experiences of a stimulus. Patients sometimes report this as "black on black," or liken it to "a mouse under the carpet" (Zeki and ffytche, 1998; Ffytche and Zeki, 2011). Given this, one can contend that conscious perception can be classified into an instance of conscious *detection*, in which the observer reports seeing something but not being able to report on the exact identity of the item being shown, and conscious *identification*, in which the observer has a clear percept of what was shown (for a review see Ramsøy and Overgaard, 2004).

In terms of brand communication, our data provide novel suggestions for the importance of improving brand preference. In particular, besides the effects that overt brand liking can have on products and information, our data suggest that brand preference affects attentional mechanisms. In today's increasingly crowded consumer communication space, such findings are of utmost importance. For example, the American Association for Advertising Agencies (Britt and Adams, 2007) provided a conservative estimate of a typical exposure to over 600 ads per day for an adult (although if you count all exposures whenever you pass a brand you might run up to 20.000 exposures per day). Of those advertisements, only about 10% were explicitly noticed and recalled. Our results suggest that which ads are recalled is not purely coincidental but that there is a significant contribution of individual preference – especially strong disliking and liking – upon the likelihood that a brand will be detected and as such be remembered. This suggests that from a brand communications perspective, inducing strong emotional responses in consumers has an added benefit that it increases the likelihood of that brand being detected in a crowded environment. Although we do not think that inducing strong brand disliking in consumers will have consumer benefits, there may be a space in which negative communication may have an impact on detection, such as in health-related communication.

Our study lends further support to the use of the PAS, a method for assessing the clarity of perception. The PAS was originally conceived in 2004 (Ramsøy and Overgaard, 2004) in which it was demonstrated that above chance levels of guessing the features of a stimulus was only possible when subjects reported having detected the stimulus, but chance levels of guessing when reporting having seen nothing. Employing neuroimaging measures, the PAS score was related to a graded neural response in regions known to be involved in conscious perception (Christensen *et al*., 2006). Taken together, our results lend further support to the use of the PAS in studying consciousness and extends these results by demonstrating that emotions lead to a parallel shift in perceptual clarity, as assessed by the PAS. That is, for the brief stimulus duration, emotionally neutral percepts tend to be unseen by the subject, but stimuli that bears on a subjective preference are more likely to be reported as "glimpses." Likewise, at middle stimulus durations, brand names with emotional salience are more likely to be reported as clear experiences compared with brand names for which the subject has a neutral preference.

CONCLUSION

The results presented here are, to our knowledge, the first to demonstrate that subjective hedonic value – measured as subjective preferences for brands – leads to a stronger

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likelihood that information associated with the brand will be processed consciously. Furthermore, by extending the study to include both positive (like), negative (dislike), and neutral preferences (indifferent), previous research is extended and show that positive preference has a larger impact on consciousness than both negative and neutral preferences. These results both improve our understanding of the relationship between emotions, valence, attention and consciousness, and in particular, our understanding of how brands affect emotional processing, leading to significant changes in attention and subsequent cognitive processing.

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