Neural Aspects of Brand Love

Abstract

Brand love has been identified as a key driver for behavioral outcomes such as brand loyalty, positive WOM or price premium. While we know a great deal about the psychological aspects of brand love, we know very little about the neural ones. The purpose of this paper is to explore this. We used a 3 (positive, negative, neutral video stimuli) x 2 (strong vs. weak brand) experimental design. To assess the neural aspects, 53 participants underwent *f*MRI scans while watching short video clips and rated them on a 7-point bipolar scale (-3 = very negative; +3 = very positive). Our results suggest a '*negativity bias paradox*' in contradiction findings from psychology literature (based on attitudinal data) that negative events exert greater impact on consumer behavior than positive ones. We also find evidence for a '*strong brand paradox*' with fans of the weaker brand showing greater neural activities than fans of the stronger brand which contradicts findings from consumer behavior research.

Keywords: *Brand Relationships, Brand Love, Neuroscience*

Track: *Consumer Behavior*

1. Introduction

Since the initial works by Blackston (1992), Fajer and Schouten (1995) and Fournier (1998) research on consumer brand relationships has come a long way. As Fetscherin and Heinrich (2015, p. 387) state, "consumer brand relationships is interdisciplinary, complex and multi-dimensional with a variety of concepts, constructs and underlying theories borrowed from different fields." Concept studied are brand attachment (Thomson, Macinnis, & Park, 2005), brand commitment (Wang, 2002), brand passion (Bauer, Heinrich, Martin, 2007; Pichler & Hemetsberger, 2007), brand tribalism (Veloutsou & Moutinho, 2009) or brand love (Batra et al., 2012) just to mention a few. Each concept relates to a different degree of emotional connection consumers have with brands either individually or in a group context. However, brand love has been identified as a key concept either consisting of some of these concepts (e.g., commitment, passion) or driving some of these concepts such as brand loyalty. Furthermore, current research has three major gaps.

(1) This relates to the methods and data used. Current studies uses mostly attitudinal data gathered by means of interviews or surveys. This is a serious limitation as consumer behavior is a "consequence of both cognitive and affective processing" (Walla, Koller, & Meier, 2014, p. 1). Attitudinal data allows to assess mostly cognitive behavior and intentions but does not capture adequately behavior and specifically affective processing which asks for neuroscientific methods which tap more into automatic, implicit and non-conscious processes. Consumer neuroscience uses different methods to gather behavioral data. They can be grouped into non-brain related recordings (e.g., eye tracking, galvanic conduct, facial electromyography) and brain related recordings. The latter by recordings on the *electric* activities in the brain (e.g., electrocardiography – EGG, magnetoencephalographic - MEG) or *metabolic* activities in the brain most notably functional magnetic resonance imaging (*f*MRI). Only very recently researchers began to use neuroscientific methods in branding by using eye tracking (Plassmann, Ramsøy, & Milosavljevic, 2012), galvanic conduct (Plassmann et al., 2012; Reimann, Schilke, Weber, Neuhaus, & Zaichkowsky, 2011), electrocardiography (Fisher, Chin, & Klitzman, 2006) or *f*MFRI (Plassmann et al., 2012; Yoon et al., 2006).
(2) The second gap relates to the characteristics studied. While we know a great deal about the psychological characteristics of brand love, we know very little about the neural ones. By using neuroscientic methods, it allows us to better understand the affective processing and resulting region of interest (ROI) in the brain which relate to the brand love contruct.
(3) The third gap relates to the object studied. Most studies focus on individual consumer package goods and few focus on sport clubs. This is surprising as an estimated $57 billion is spent every year on sponsorship alone. Football (soccer in U.S.), for example, is the most popular sport in the world (Deloitte, 2012) and over 900 million people tuned in to watch the final of the WorldCup 2014. As a social experience, football as a whole is more than the sum of its parts (Claussen, 2006) where the club becoming a part of a person's identity, an "extension of the individual-self" (Funk & James, 2004, p. 11). The football fan, once s/he is set with one club, will most likely never change to another club. This is one major difference with consumer packaged products that fans have an 'extreme' loyalty towards their club.

Against this background, the contribution of this paper is threefold. First, we focus on an important industry (sports) with a focus on soccer in order to better understand fan's 'love' towards their club. Second, we use *f*MRI to investigate fan brand love. Third, in doing so, we complement existing studies by providing insight into the neural aspects of brand love.

2. Hypotheses Development

2.1. Background

The few branding studies using *f*MRI investigated for example brand familiarity for soft drinks (McClure et al., 2004) or car brands (Schaefer, Berens, Heinze, & Rotte, 2006), child's brain response to logos (Bruce et al., 2014), brand judgment (Yoon et al. 2006), brand preferences (Venkatraman et al. 2012), consumer loyalty (Plassmann, Kenning, & Ahlert, 2007) or emotions to evaluate brands (Esch et al., 2012). To the best knowledge of the authors, and despite the centrality of the construct 'brand love' in brand relationships, no study assessed the neural aspects of brand love. This is surprising as from a theoretical point of view, brand love is a central concept in brand relationships (Batra et al., 2012; Fournier, 1998) and from a practical point of view, as Barker, Peacok, and Fetscherin (2015, p. 4) show "brand love does in fact signal superior company performance and, ultimately, higher total shareholder return" where companies with more 'love' have a 11% higher total shareholder return (TSR) compared to companies with less 'love'.

2.2. Hypotheses

Prior studies have shown that people place greater weight on negative events and remember them more than positive events. Thus negative events exert a stronger influence on people's behavior. This is referred as the 'negativity bias' (Kanouse & Hanson, 1972). For example (Lutz, 1975) found that negative information about a product attribute led subjects to shift their attitude further in the negative direction more than positive information shifted their attitude in the positive direction. The explanations of the negativity bias are many and varied, but they all suggest that negative events and emotions tend to be have a stronger impact than positive ones. We therefore want to investigate if negative stimuli impact fans (consumers) more than positive ones with the following hypotheses

H1a: A negative stimuli is better remembered (hippocampal area, temporal lobe) by fans than a positive stimuli.

H1b: A negative stimuli is associated with greater negative affect (deactivation in VTA) by fans than a positive stimuli.

The branding literature has a long tradition on arguing that there are differences between 'strong brands' and 'weak brands' and these differences impact brand attitude (Dahlén et al., 2005) brand loyalty (Allender & Richards, 2012), brand elimination (Mao, Luo, & Jain, 2009), or purchase intention (Dahlén et al., 2005) just to mention a few. We expect that brands which are 'loved' more to have more activation in certain parts of the brain than weaker brands. Specifically, we expect that scenes associated with stronger brands are likely to be better remembered (hippocampal area, temporal lobe) than scenes of weaker brands and we test the following hypothesis:

H2: Fans of strong brands remember better (hippocampal area, temporal lobe) scences associated with their club than fans of weaker brands.

3. Method

3.1. Brands

To test our hypotheses between a 'strong brand' and 'weak brand' we chose two teams from the same country and soccer league. We selected *Futebol Clube do Porto* (FCP) and *Associação Académica de Coimbra* (AAC). FCP (strong brand) is the most successful football club in Portugal in the last 35 years, winning all national and many international titles while AAC (weak brand) did very poorly in the same period with only 20 seasons in the first league and 15 seasons in the second league.

3.2. Participants

A fan is not just an "emotionally committed consumer of sporting events" (Guttmann, 1986, p. 6), but is emotionally attached to a brand (Pimentel & Reynolds, 2004), with a permanent and constant interest in a club (Wann et al., 2001). Fans are enthusiastic devotees (Sloan, 1989) who make make sacrifices 'for' their team such as spending time and money to watch a game (Cayolla & Loureiro, 2014). Fans have been identified to be brand lovers given that once a fan, they are extreme brand loyalty and normally don't change their club. This provides a suitable context to study brand love. Sixty one participants from both clubs were recruited. They come from a wide range of professions, ages, education and income, and all of them considered themselves as football fans of either FCP or AAC. Out of the 61 subjects scanned, 53 were included in this study (8 subjects were excluded due to excessive head motions) where 27 were FCP and 26 were AAC fans (53 males, aged 20.6-60.2 years, mean age 34.4±10.6 years). All subjects were screened using standard *f*MRI scanning protocol.

3.3. Procedure

All participants signed the informed consent approved by the Ethics Committee of the Faculty of Medicine of the University of Coimbra, in accordance with the Declaration of Helsinki. Prior the *f*MRI, participants completed a demographic questionnaire and another one which assessed the level of identity with the football club (Wann & Branscombe, 1993). The present study used *f*MRI in order to map brain activations (and deactivations) based on the statistical parametric maps. The experiment was performed in a 3T Magnetom Trio Tim whole body scanner (Siemens, Erlangen, Germany), using a 12-channel head coil. Functional information was obtained using Echo Planar Imaging (EPI) sequences covering nearly the whole brain.

3.4. Stimuli

During the *f*MRI scans, participants watched short video clips of 6 - 12 seconds of positive (own team scores a goal), negative (opposing team scores a goal) or neutral (goal situation of other teams) goal situations followed by an answer block of 8 seconds. A black screen of 9-15 seconds followed each pair of video/answer defining the baseline period (see Figure 1). At the end of the session, participant underwent 2 EPI-BOLD scans of 10 minutes each. A total of 35 videos were presented to each participant who rated them on a bipolar -3 (negative) to +3 (positive) scale resulting in 1,855 *f*MRI observations. Videos were shown inside the MR scanner by means of an LCD screen and audio was provided through headphones.

Figure 1: Experiment

Video clips were randomized in each session and were different for FCP and AAC fans as videos included goal situations of their favorite team's respectively of scoring a goal (positive stimuli), opposing team scores a goal (negative stimuli) and goal situations of a unknown team to participants. To assure the consistency of visual content, all videos are exclusively goal situations, excluding images of fans' reaction, coaches' reactions, lifting cups or any failed goal. EPI-BOLD images were undistorted using the GRE maps and data was pre-processed using slice scanning time and motion correction. The anatomical and functional data were co-registered automatically and manually verified.

4. Results and Discussion

We conducted two ANOVA analyses to test our hypotheses. One to determine the main effects of the positive and negative stimuli (videos) on brain activities and regions as well as another ANOVA to assess any differences between subjects of fans (strong vs. weak brand).

4.1. Difference between positive and negative stimuli

Figure 2 shows the significant main effect of positive and negative stimuli for all subjects (videos visualization) with values of [$F(2,64) > 6.37$, $p < 0.003$] in a cluster involving the right inferior temporal lobe, parahippocampus and hippocampus. The maps also revealed significant differences in the right inferior parietal lobule, thalamus, ventral tegmental area, and posterior cingulate (not discussed and tested in this paper to keep it within 7 pages).

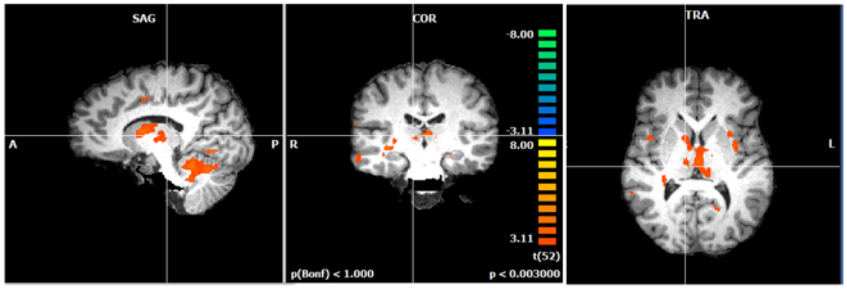

Figure 2: F-map revealing the significant main effect of videos

Our results show there are more brain activities in the various parts of the brain (inferior temporal lobe, parahippocampus and hippocampus) for positive compared to negative simuli. This is in contrary to our H1a and H1b based on prior findings on attitudinal data in the psychology literature documenting the '*negativity bias'*. This suggests a *'negativity bias paradox'* where our neural results are in contradiction with attitudinal results.

4.2. Difference between strong and weak brands

We also found a significant main effect of fans for strong and weak brands on brain activities with [$F(1,32) > 5.16$, $p < 0.03$] in the Medial frontal gyrus and Anterior cingulate (MFC) (Figure 3). Posterior hippocampus and parahippocampus bilaterally, posterior cingulate and left caudate, and right inferior parietal lobule (Brodmann Area 40).

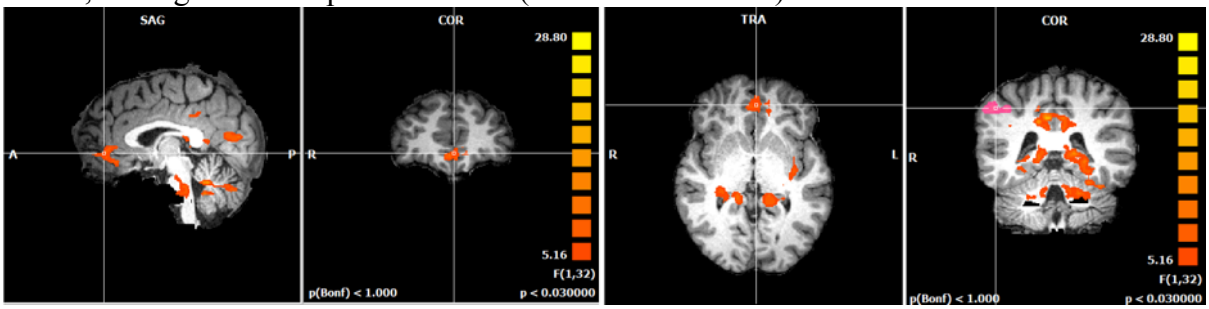

Figure 3: F-map revealing the significant main effects of fans (FCP vs. AAC).

The following Table 1 outlines the mean beta value *differences* between FCP and AAC subjects for positive and negative stimuli (videos) in the Region of interest (ROI).

Mean difference between FCP-AAC	**Positive stimuli**	**Negative stimuli**
Inferior parietal lobule	-0.382	-0.356
Medial frontal gyrus and Anterior cingulate (MFC)	-0.247	-0.288
Posterior cingulate and left caudate	-0.098	-0.232

Left posterior hippocampus and parahippocampus	-0.343	-0.443
Right posterior hippocampus and parahippocampus	-0.189	-0.359

Table 1: Mean Beta Values Differences between FCP and AAC subjects

Contrary to H2, there is less activities in the various parts of the brain (inferior parietal lobule, medial frontal gyrus and anterior cingulate, posterior cingulate and left caudate, left and right posterior hippocampus and parahippocampus) for fans for strong brands than there is activities of fans for the weak brand. This is another surprise. This suggests a *'strong brand paradox*' where our neural results are in contradiction with studies from consumer behavior based on attitudinal data. However, our results find some support in the neuroscience literature where Plassmann et al. (2012, p. 28) "found that when subjects viewed their most beloved brands, there was a decrease in the activation of both the dlPFC and the hippocampus … this study may seem at odds with previous suggestions of a positive relationship between memory engagement and preference formation." In conclusion, our *f*MRI findings yielded insights that are surprising and contrary to expectations based on prior findings from the psychology and consumer behavior research based on attitudinal data and future research should investigate this further.

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