


ACADEMIC PAPER

The impact of emotions on recall: An empirical study on social ads

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Abstract

Emotions are a complex phenomenon that entails a tricky problem regarding the measurement. To partially overcome this question, we assess emotions both using self-report and measures commonly used in neuromarketing. This study assesses the accuracy of the recall after 4 months regarding two social advertising videos about female genital mutilation. Forty female participants were recruited. The skin conductance trend of the participants is different when viewing the two videos. The majority of participants (94.9%) reported that the two videos elicited different emotions (sadness for the first video and anger for the second one). Furthermore, according to arousal and valence model, these data are consistent with the literature that underlines the importance of psychophysiological indexes in measuring emotions and their associations with memory performances.

KEYWORDS

advertising, emotion, memory, psychophysiology, skin conductance

1 | INTRODUCTION

Social advertisements (ads) are commonly designed to influence the voluntary or involuntary behaviour of a target audience in order to improve the welfare of individuals and society (Donovan & Henley, 2003) according to the idea of libertarian paternalism (Sunstein & Thaler, 2003). The success of public health interventions, especially those promoting behavioural change, rests on effective communication (Russo, 2011).

The purpose of the present study is to analyse the recall accuracy of two social advertising videos that used two different communication strategies, that is, violent and nonviolent code.

Past research has emphasised the importance of emotional reactions to advertising and has focused on the study of memory: Specifically, researchers put their attention on the responses in terms of recall, because emotional response to an ad is proved to influence

several aspects including the attitude towards advertising and brand (Batra & Ray, 1986; Du Plessis, 2005; Edell & Burke, 1987; Hall, 2002), attention (Medina, 2010; Stayman & Batra, 1991), the recall of the message, and therefore its effectiveness (Englis, 1990; Hazlett, Hazlett, & Yassky, 1999; Mai & Scholler, 2009; Medina, 2010; Page, Thorsom, & Heide, 1990; Stayman & Batra, 1991). However, the challenges both for researchers and for advertisers are mainly two: (a) which is the better way to measure both emotions and memory and (b) which communicative strategy is the most effective in promoting awareness on welfare issues.

Beyond the classic “hierarchy-of-effects” model (Holbrook, 1986), more recent studies have applied current knowledge from neuroscience and consumer psychology to study consumer processing of advertising as narrative structures of meaning in which emotions play a significant role (Escalas, 2004; Passyn & Sujun, 2006). Consumer research has been largely silent about properties of emotions beyond their valence that may underlie and differentiate them. This seems to be due to the widely held assumption that the valence of an emotion featured in an ad (i.e., its positivity or negativity) is the primary predictor of a consumer’s response to the ads (Elster, 1998; Forgas, 1995). Thus, if an ad depicts any of the several emotions that share a common valence (e.g., negative feelings such as fear, anxiety, or guilt), people’s behaviour toward the ads will simply reflect that valence (e.g., negative).

*Dr. Missaglia and Dr. Oppo wrote the first draft of the paper and contributed equally to the study.

[†]Dr. Oppo performed statistical analyses and discussed the results.

[‡]Dr. Missaglia, Dr. Oppo, Dr. Mauri and Prof. Russo wrote the protocol of the study.

[§]Dr. Missaglia, Prof. Russo, and Dr. Ciceri reviewed and discussed the literature.

[¶]Dr. Ghiringhelli analyzed the FGM topic.

All the authors read and approved the final version of the paper.

From a measurement theory point of view, traditional techniques include the so-called “self-report measures”, and the first studies that assess the role of emotions in advertising research used these kinds of measures. However, some authors claim that these techniques may not be able to capture the whole complexity of emotional experience because they base exclusively upon verbal statements and can be distorted by cognitive bias (Haley, Staffaroni, & Fox, 1994). Specifically, self-report measures capture conscious emotional reactions (Micu & Plummer, 2010), but the validity of these assessments for measuring lower order emotions (Poels & DeWitte, 2006) is often biased by cognitive or social desirability constraints. For these reasons, methods based on subjective emotional perceptions are not always able to accurately capture the emotional state of the person. By contrast, the nonverbal measurements, based on the registration of neurophysiological parameters, may give a more accurate and reliable output because they are not mediated by cognitive processes (Poels & DeWitte, 2006).

Regarding the second point previously stated, social ads are often designed using a “shock tactic” to evoke negative emotions (i.e., fear) to raise awareness and challenge pre-existing attitudes toward relevant social issue as violence on women, obesity, smoking, and alcohol abuse (Henthorne, LaTour, & Natarajan, 1993; LaTour & Rotfeld, 1997; Witte & Allen, 2000). However, storytelling with soothing emotional arousal is viewed as one of the most effective strategies to encourage prosocial behaviour (Merchant, Ford, & Sargeant, 2010).

In terms of effectiveness, literature has shown that there are conflicting results concerning studies that compared negative versus positive storytelling. Some authors found that the use of fear and shock in marketing campaigns has a positive effect on raising awareness about the consequences of smoking (Wakefield, Flay, Nichter, & Giovino, 2003), the social costs of binge drinking (Pilling & Brannon, 2007), and the deleterious effects of drug abuse (Schmeling & Wotring, 1980); however, others have reached the opposite conclusions (Capella, Taylor, & Webster, 2008; Pechmann & Ratneshwar, 1994) explaining this data as a “boomerang effect” described in the theory of psychological reactance (Brehm, 1966; Brehm & Brehm, 1981).

It is important to underline that the final purpose of a social communication is to bring awareness of a phenomenon, in particular, towards a phenomenon that is partially unknown to promote a behavioural change. Thus, in order to clarify this issue, it is important to understand how memory works. A good deal of literature underlined the importance of emotions both on the recall and on the recognition of previous learned behaviour (LeDoux, 1994). Researchers referred to “emotional memory” as the way in which the individual learning experiences (in particular, intense emotion as fear) shape memory.

The focus of this research is to evaluate which kind of communication strategy—between two options—is the most effective (in terms of recall) in promoting a rising welfare issue in the western society due to migration: female genital mutilation (FGM).

1.1 | Aims of the study

The aim of this study was to assess the 4-month recall accuracy of two social ad videos that used two different kinds of communication

strategy: one based on a nonviolent code and one based on a violent code. We hypothesised that the recall would be better for the video that evoked a greater arousal. Furthermore, we wondered if a very high arousal might interfere in recall and which was the best communicative strategy.

In particular, we wanted to analyse 3 different aims:

- Aim 1: Assess the 4-month recall of two social ad videos.
- Aim 2: Evaluate which were the social ads preferred by the participants to promote FGM awareness.
- Aim 3: Analyse psychophysiological and self-reported measures associated with the recall and with the video's preference.

2 | MATERIALS AND METHOD

2.1 | The female genital mutilations project

The present study was conducted in the framework of the project “Application of integration and communications techniques and models in a multicultural society. The Female Genital Mutilations project” (IRER:2011B015) in collaboration between EUPOLIS and Regione Lombardia (Applicazione dei modelli e modalità di integrazione e comunicazione in una società multiculturale. La progettualità MGF). The primary aim of this project was to analyse the FGM phenomenon in order to provide the basis for social campaigns enabling to contrast and eventually reduce this kind of practice. Developing a culturally sensitive language (UNFPA, 2004) is an invaluable negotiating and programming tool. If the language used is loaded with negative judgements on the community or its values, it creates unnecessary tensions and constructs a wall between the community and the programme. Community might perceive a phrase or an image as value-loaded, and this perception may lead to the community's resistance, at least in the project, launching phase, to any advocacy campaigns to terminate the practice. By contrast, the use of a neutral language allows discussion of the practice and its negative impact on the health and right on woman.

2.2 | The experiment

The present experiment aims to test the accuracy of the recall of two social ad videos (stimuli) on female genital mutilation, after 4 months. Participants viewed 2-min videos on this topic. The first social ad spot (Social Ads 1) was based on a nonviolent code, and it was accurately described in Appendix A; the second social ad spot (Social Ads 2) was based on a violent code (see Appendix B). The ads were selected from a range of options by an expert panel ($N = 10$) who independently assessed as nonviolent the Social Ads 1 and as violent the Social Ads 2. Furthermore, the 100% of the experts stated that the two social ad spots evoked different emotions, namely, sadness for the Social Ads 1 and anger for the Social Ads 2.

2.3 | Participants

Participants were contacted via email and/or via telephone to plan and schedule their participation to the experiments that took place at the

Behaviour and Brain Lab, IULM University, Milan. Forty undergraduate students (age range 21–28 Mean = 23.38, *SD* = 1.97) were voluntarily recruited. We decided to recruit only women because of the delicate topic. All participants signed an informed consent before beginning the experimental procedure.

To avoid a possible carry over effect, participants were randomly assigned to one of two conditions; randomization procedure was carried out using a random list. Eighteen participants (45.0%) were first exposed at the Social Ads 1, and 22 participants (55.0%) were first exposed at the Social Ads 2; we controlled for the effective randomization using chi-square ($\chi^2 = 0.64$; $p = .42$). During the course of the experimental protocol, one participant declared that she did not feel well, and she started to cry; for this reason, we ended the experimental procedure, we reassured the participant, and we deleted her from the analysis.

2.4 | Procedure

After arriving to the psychophysiological laboratory, participants were asked to sit down in front of a computer and were informed about the goals of the study, procedures, and cautions for study participations. To collect psychophysiological data, probes were attached by the experimenter ((Anna Missaglia and Annalisa Oppo, licensed psychotherapists) licensed psychotherapists) while explaining briefly the general rationale of the research. Once the subject felt comfortable, the experimental test started while instructing subjects to try to remain without moving during the beginning baseline (3 min watching a cross on the screen) and the presentation of the stimuli (Social Ads 1 and 2).

After each spot, subjects were asked to answer two questions: one regarding the intensity of the emotion and one about the type of emotion felt during the viewing of the spot.

2.5 | Psychophysiological measure

Three different psychophysiological measures (heart rate, skin conductance, and electromyography) were used.

2.5.1 | Heart rate (HR)

Concerning the measures of HR variability, amongst others, the interbeat interval (also known in the scientific literature as RR interval, the time elapsing between two consecutive R waves in the electrocardiogram) from blood volume pulse is the mean of the distance between heartbeats. For instance, in a very general way, a distance of 1,000 ms (1 s) means that there is a heartbeat every second (60 beats per minute, generally during rest). On the opposite, a distance of 500 ms (half of a second) means that there are 2 heartbeats every second (120 beats per minute, which means an important increase of cardiac activity in comparison to rest). Several studies showed the correlation between HR activity and affective states (Magagnin et al., 2010; Poels & DeWitte, 2006).

2.5.2 | Skin conductance (SC)

Skin conductance is the measure of electrical conductance of the skin that changes in presence (or absence) of sweat. SC values increases

when the sweating glands, controlled by the autonomous nervous system, release more sweat because of motor or mental activity (once the environmental temperature is controlled and always at the same level). The correlation between SC and emotions has been shown by the scientific literature (Bolls, Lang, & Porrer, 2001; Gakhal & Senior, 2008). From previous literature that implied the use of physiological methods in the testing of advertisements, SC emerges as a good indicator of arousal (Bolls et al., 2001; Boucsein, 1992; Ravaja, 2004; Sequeira, Hot, Silvert, & Delplanque, 2009). Moreover, SC can represent the level of arousal in Lang model of emotions relying on psychophysiological measures.

2.5.3 | Electromyography (EMG)

The EMG is the measure of the electrical activity produced by skeletal muscles that increases when the muscles contracts in order to move the body or because of autonomic nervous activity related to emotional and/or mental activity. Facial EMG is the best measure of the valence of the emotional reaction as it records facial muscle movement from two different muscles: the zygomatic muscle (reacts more at exposure to positive stimuli) and the corrugator muscle (reacts more at exposure to negative stimuli; Bolls et al., 2001; Lang, Dhillon, & Dong, 1995; Larsen, Norris, & Cacioppo, 2003; Witvliet & Vrana, 1995). In this research, the muscle monitored is the corrugator supercilii from the face, because of its important correlation with emotional phenomena (Lang, 1995; Witvliet & Vrana, 1995).

For monitoring the responses of the autonomic nervous systems, physiological signals of blood volume pulse, galvanic skin response, and EMG of corrugator supercilii were monitored. Flexcomp (a device from Thought Technology) was used for the acquisition of the data, and Biograph Infinity 3.2 and Matlab 7.2 were used to compute and analyze the data collected. The Flexcomp device was synchronised with the eye-tracking system according to a protocol used in previous research. The sampling frequency for measuring the physiological signals was set at 256 Hz.

Eye and gaze tracking were recorded and computed by Senso Motoric Instruments system 250 RED at 250 Hz.

Three-minute baseline assessment was conducted to avoid individual variability in psychophysiological parameters. To have control about individual differences, the so-called “baseline” procedure was applied to the experimental protocol. According to the literature (Onorati, Barbieri, Mauri, Russo, & Mainardi, 2013) in experimental protocols taking advantage of psychophysiological measures (HRV, SC, Respiration, EMG, etc.), it is important to apply the baseline calculation for each participant. As indicated in the “Procedure” section, before starting the experiment, every subject was exposed to 3 minutes of a black screen with a white cross. We calculated the differences between the mean value of baseline condition and the mean value of experimental exposure.

2.6 | Explicit measures

One self-report measure and one interview were used, and the last one represents our main outcome measure.

2.6.1 | State-Trait Anxiety Inventory (STAI)

The STAI is a reliable and valid measure that has been used with both clinical and nonclinical populations (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The measure comprises separate self-report scales for assessing state and trait anxiety. The state anxiety scale (S-anxiety) consists of 20 items scored from 1 to 4 that evaluate current feelings of tension, discomfort, anxiety, and nervousness, while the 20 items of the trait anxiety scale (T-anxiety) scored from 1 to 4 trait scale assess anxiety levels in general. The cutoff score of 46 (75th percentile) suggests the presence of a state or a trait anxiety. Participants filled STAI trait before the exposure of the social ads and filled two STAI state after the exposure of Soc Ad 1 and after the exposure of Soc Ad 2.

2.6.2 | Interview: outcome measure

In order to assess long-term recall, a phone interview (see Appendix C) about 4 months after the video exposure was conducted by a psychotherapist (A.O.). The phone interview aimed to test the accuracy of long-term memory of the participants to the two stimuli in order to give an answer to the core research question: "which kind of storytelling determines a greater recall?"

The decision to administer the phone interview after 4 months raised up from the peculiarities of the research. Participants, all university students, had experienced something peculiar for them. It was considered, therefore, not to use 24-hr measures of memory, classically used in market research, but to carry out for a measure of long-term memory.

However, it has to be acknowledged that the time period used to assess long-term recall in this setting was extremely variable, and the literature does not provide specific time frame in which the long-term recall should be assessed (Lull & Bushman, 2015; Terry-McElrath, Emery, Szczyka, & Johnston, 2011).

The interview was conducted in a structured way using mostly open-ended questions (see appendix C). All questions were unprompted in order to avoid any kind of suggestions. This interview was adapted from an interview that was previously used in social ad research (Durkin & Wakefield, 2010). We considered the number of reported details to assess the recall accuracy, and finally, we asked to participants which social ads they would use to promote social awareness about FGM.

2.7 | Statistical analyses

Data are presented as means and percentages. The differences between categorical variables were calculated using chi-square (i.e., emotion reported by participants), while the differences between

continuous variables were calculated using paired sample *t* test (i.e., state anxiety reported by participants after the two-video exposure; blink per second number). To analyse the trend of GSR (Galvanic Skin Response) during the video exposure, we used a generalised linear model for repeated measure. Specifically, the SC values registered throughout the video exposure were entered into a repeated measure analysis of variance (SC per second) as within-subject factors, and Social Ads 1 and 2 were entered in the model as a between-subject factor. Moreover, in order to assess which social ad was more effective in long term, we used logistic regression models, and odds ratio (OR) and 95% of confidence intervals were calculated to assess which social ad was more effective in long term. To clarify the magnitude of effect size, we rescaled the OR in Cohen *d* using the γ coefficient ($\gamma = [OR - 1]/[OR + 1]$; Kraemer & Kupfer, 2006). Effect sizes of 0.2, 0.5, and 0.8 are "small," "medium," and "large" (Cohen, 1988).

Finally, to analyse the recall accuracy, paired sample *t* test (i.e., number of particular recalled) and chi-square were used (emotion explicitly reported by the participants).

The alpha level was set at 0.05. Analyses were conducted using SPSS (Statistical Package for Social Science), version 21.

3 | RESULTS

3.1 | Stimuli analysis

The 94.9% ($N = 37$) of the participants reported that the two videos elicited different emotions. In Table 1, psychophysiological and self-report measures were reported.

In particular, using a chi-square to assess the distribution of the emotion that the participants reported for both social ads, we observed that a greater percentage of them reported to feel sadness during the Social Ads 1 (chi-square = 37.92, $p < .001$) and anger during the Social Ads 2 (chi-square = 11.64, $p = 0.02$).

In Figure 1a, we reported the distribution of the emotion notified during the Social Ads 1 and in Figure 1b we reported emotion during the spot 2.

Looking at the state anxiety self-report measure, we found that the participants reported a higher score ($t = 2.99$; $p = .006$; $d = 0.7$) after seeing the Social Ads 2 (STAI mean = 54.21 [$SD = 12.47$]) than during the Social Ads 1 (STAI mean = 45.72; $SD = 10.12$).

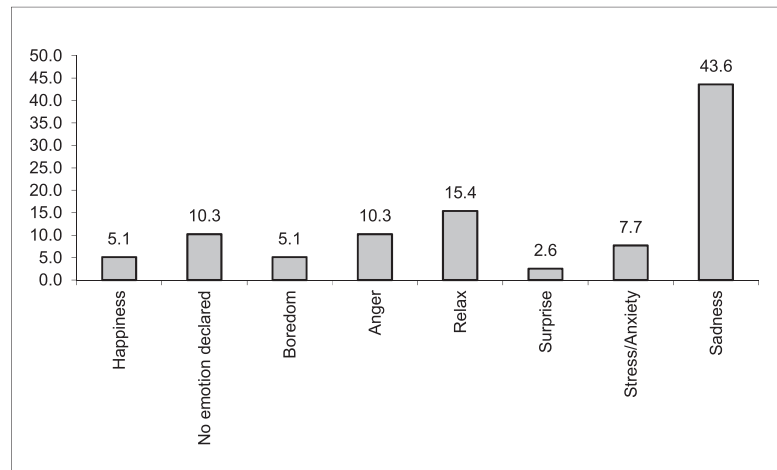
Analyzing the intensity of the emotion reported after the viewing of the videos, we observed that participants reported a significantly

TABLE 1 Self-report and psychophysiological measures of the stimuli (Social Ads 1 and Social Ads 2)

| | Social Ads 1 | Social Ads 2 | Student <i>T</i> and <i>p</i> |
|--------------------------------|-----------------|----------------|-------------------------------|
| SC μ ohms | -0.573 (2.79) | -1.51 (3.24) | $T = 1.83$, $p = .05$ |
| HR (RR INTERVAL) | 0.465 (13.70) | -7.114 (15.15) | $T = 1.78$; $p = .08$ |
| EMG (Microvolts) | 0.136 (2.75) | -0.612 (1.76) | $T = 1.35$; $p = .18$ |
| Blink/sec | 0.29 (0.15) | 0.22 (0.16) | $T = 3.65$; $p = .001$ |
| State STAI | 45.72 (10.12) | 54.21 (12.48) | $T = -2.99$; $p = .006$ |
| Emotion intensity | 3.38 (0.91) | 4.67 (0.58) | $T = -8.48$; $p < .001$ |
| Emotion predominantly reported | Sadness (43.6%) | Anger (38.5%) | |

Note. EMG = electromyography; HR = heart rate; SC = skin conductance; STAI = State-Trait Anxiety Inventory.

(a)



(b)

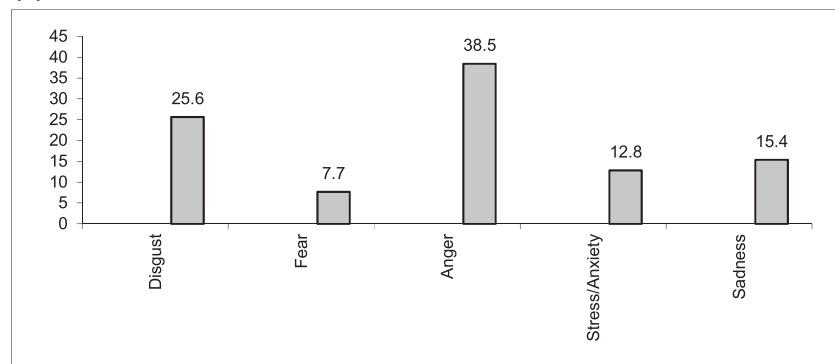


FIGURE 1 (a) Distribution of the emotion during the Social Ads1 (b) Distribution of the emotion during the Social Ads2

higher intensity for the Social Ads 2 (Mean = 4.67; SD = 0.57) than for the Social Ads 1 (Mean = 3.38; SD = 0.90). Furthermore, looking at the SC performance during the video exposures, we observed that it was similar in the two videos, but it was in average higher ($F = 3.88$, $p = .05$) during the Social Ads 2.

Overall, we can state that the arousal was greater during the view of the Social Ads 2 (Figure 2).

Moreover, our results showed that during the Social Ads 1 (blink/sec = 0.29; SD = 0.16), the participant blinked more than during the Social Ads 2 (blink/sec = 0.22; SD = 0.17; $t = 3.65$; $p < .001$,

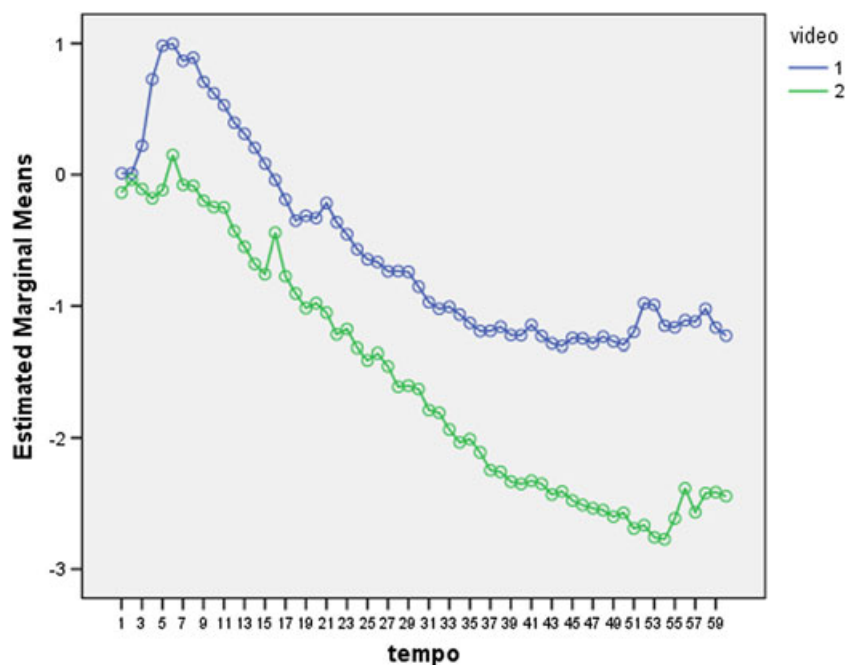


FIGURE 2 Skin conductance performances during the video exposure

$d = 0.51$). There were no significant differences, instead, in the HR and in the EMG response to the two stimuli.

3.2 | Follow up interview

After 4 months (days = 117.58; $SD = 15.78$), a telephonic interview was conducted (see appendix A). Thirty-eight (97.4%) of the participants completed the interview. One participant (2.6%) did not answer the phone. Data regarding the accuracy of recall are reported in Table 2.

Overall, the recall was better for the Social Ads 2, both in terms of number of particulars recalled and for the explicit declaration of the subject. The 87.2% of the participants stated that Social Ads 2 was more intense. However, it has to be acknowledged that the 30% of the participants told us that they would use Social Ads 1. In particular, we found that the 64.3% of the participants who reported that they felt anger during the Social Ads 2 chose the Social Ads 1. In order to analyze this issue, a chi-square and an OR was calculate. We found that the participants who reported anger chose Social Ads 1 in a greater percentage ($\chi^2 = 10.43$; $p < .001$) than those who reported other emotions (Table 3). Rescaling OR in Cohen's d using the γ coefficient, we found a large effect size ($d = 0.83$).

Furthermore, We found that the participants who reported to feel anger (mean RT = 9.38 s; $SD = 4.96$ s) during the exposure to Social Ads 2 were faster ($t = -2.19$; $p = .035$) in denominating their emotions during the vision of Social Ads 2 than the participants who reported to feel other types of emotion (mean RT = 15.56 s; $SD = 10.13$ s). Moreover, the participants who felt anger during the exposition of Social Ads 2 reported a lower score ($t = -2.40$; $p = .032$) on STAI-Trait (mean = 40.84; $SD = 5.3$) than those who did not felt anger (mean = 47.37; $SD = 9.08$). However, the participants who felt anger and who did not felt anger reported the same scores on state anxiety both after the viewing of Social Ads 1 ($t = -0.172$; $p = .865$) and Social Ads 2 ($t = -1.31$; $p = 0.199$).

4 | DISCUSSION

Since the early 1960s, when Lavidge and Steiner (1961) introduced almost certainly the first advertising model that included the role of emotion, a good deal of academic and applied research on this topic

TABLE 3 Predictors of the follow-up choice (Social Ads 1)

| Emotion | β | SE | p | OR | 95% CI |
|---------|---------|------|-------|-------|------------|
| Anger | 2.345 | .152 | <.001 | 10.43 | 9.27–11.59 |

Note. CI = confidence interval; OR = odds ratio; SE = standard error.

was conducted. In 5 decades, literature went beyond the supremacy of the sentient thinking underlying how feelings are much more important and influential than we tend to think they are (Gordon, 2006; Zajonc, 1980).

The present experiment was designed to assess whether arousal, assessed both with explicit measures and with psychophysiological measure, was able to predict a better recall after 4 months, and we hypothesised that the recall was better for the video that evokes a greater arousal.

First of all, we found that almost all participants (94.9%) stated that the two videos evoked two different emotions; in particular, we found that sadness was significantly higher after the viewing of the spot that used a nonviolent communication strategy (Social Ads 1), and anger was significantly higher after the viewing of the spot that used a violent communication strategy (Social Ads 2). Moreover, we found that both psychophysiological measure and self-report measure were congruent. In fact, participants had both a greater state of anxiety and a higher level of SC in viewing the social ads that used a violent code communication. Our results on psychophysiological signals (SC and EMG) are in line with the Lang model (1995); in fact, the two spots are designed to have the same valence (aversive) but different arousal levels to test only the effectiveness of stress (arousal) on recall. Furthermore, our results are consistent with other studies conducted in the field of advertising that identified in the SC the best indicator for arousal (Bolls et al., 2001; Ravaja, 2004) that is an index of an emotional reaction.

It could be hypothesised that the congruence between explicit and psychophysiological data might be explained with the topic of the social advertising spots used in our research. FGM, in western countries, is a practice largely condemned (Morrone, Hercogova, & Lotti, 2002), and for this reason, the participants, in line with social

TABLE 2 Follow-up interview

| | Overall % (N) | | |
|---|------------------|----------------|--------------------------------|
| Accuracy of number of social ads (N = 2) | 92.1% (N = 35) | | |
| Accuracy of topic | 100% (N = 38) | | |
| % who reported FGM | 23.1% (N = 9) | | |
| | Social Ads 1 | Social Ads 2 | T or Chi-square;p |
| Number of detail Mean (SD) | 1.69 (0.77) | 2.61 (1.02) | $T = -4.52$; $p < .001$ |
| 1st spot recalled % (N) | 56.4% (N = 22) | 38.5% (N = 15) | $\chi^2 = 1.32$ $p = .25$ |
| Accuracy of recall % (N) | 25.6% (N = 10) | 69.2% (N = 27) | $\chi^2 = 7.81$ $p = .005$ |
| Which was the one that more impressed you? % (N) | 3 (7.7%) | 34 (87.2%) | $\chi^2 = 25.97$ $p < .001$ |
| Would you use the spot 1 or the spot 2? % (N) | 12 (30.8%) | 25 (64.1%) | $\chi^2 = 4.56$ $p = .033$ |

Note. FGM = female genital mutilation.

desirability theory (Edwards, 1957), are free to declare their opinion and feeling about this topic. However, it could be argued that in other sociocultural contexts or with a sample of foreign women, we could find incongruent results between explicit and implicit measures. Thus, it could be very useful to assess this phenomenon both with traditional assessment and with measures used in neuromarketing evaluations because foreign women may not feel free to express their feelings about a practice such as FGM, which is widely prevalent in their culture.

Regarding our first aim that was identifying which was the better strategy to increase awareness on FGM, we found that the social ad that used a violent code was significantly better recalled at 4 months after video exposure for accuracy and number of detailed reported. Our data are consistent with the literature that reports how, in social advertising, a shock communication strategy aimed to raise awareness on relevant social topics might be efficient (Henthorne et al., 1993; LaTour & Rotfeld, 1997; Pilling & Brannon, 2007; Schmeling & Wotring, 1980; Wakefield et al., 2003; Witte & Allen, 2000).

However, in this study, the 30% of participants declared that they would prefer the nonviolent social ad for promoting an efficient social campaign, and this percentage almost doubled (64.3%) if we consider only participants who have reported to feel anger during the viewing of the social ads that used a violent-communication strategy. Taking advantage of this finding, we found that the likelihood of choosing a social ad that used a non violent strategy was about 10-fold higher in those participants who felt anger during the viewing of the social ad that used a violent-communication strategy. Furthermore, those participants that felt anger during the viewing of the Social Ads 2 were faster in denominating what they felt, and they reported a lower score on trait anxiety, but the same state anxiety during the vision of the social ad that used a violent-communication strategy. This data could be explained both in terms of social cognition using the theory of psychological reactance (Brehm, 1966) and in terms of learning theory using the word "aversive control" (Skinner, 1953). According to the idea of libertarian paternalism (Sunstein & Thaler, 2003), we wonder if, regarding the issue of FGM, the best way to enhance the awareness of this delicate topic is a shock tactic that, as we have seen, is associated with a better recall, but at the same time, we have to consider that we could meet the risk of evoking a strong emotion as anger that might contribute to create distance between the Italian and the foreign population.

5 | LIMITATIONS

The results of the present paper should be interpreted keeping in mind that the sample size was fairly small, and only Italian participants were recruited. Thus, our findings should be replicated using a larger sample in which immigrant women and second generation women should be recruited in order to assess if there was any differences both in explicit and in psychophysiological measures between Italian and non-Italian women, but also in first and second generation immigrants.

A second limitation is due to the characteristics of the two social ads used as experimental stimuli. First of all, despite the two social ads were defined by an expert panel who independently assessed the Social Ads 1 as "nonviolent" and the Social Ads 2 as "violent" and

also the participants reported that the two social ads evoked different emotions, the choice of the stimuli remains arbitrary. Second, the two videos have a different length: The social ad that used a violent strategy is 30 s longer than the Social Ad that used a nonviolent strategy. A further limitation is that we could not control for any sounds variable, but this limitation is mitigated by our experimental choice to enhance the ecological validity of the stimuli. Finally, in order to achieve a greater reliability on the outcome measures, two evaluators had to assess independently the accuracy of recall.

6 | FUTURE RESEARCH

Almost certainly, the final aim of the applied research in this field is to identify the predictive validity of social campaign to promote an effective and measurable behavioural change toward a relevant social issue. It would be useful to exactly operationalise what it means to promote an effective and measurable behavioural change, and it would be useful to analyse if remembering a specific social ads leads to a real behavioural change. While media professionals, opinion shapers, and policy makers have often sought to utilise communication systems for social mobilization and change, a lack of understanding of the complexity of behavioural, societal, and cultural factors on end-user consumption patterns (target) has more often led to ineffective, or even counterproductive, outcomes. The preliminary findings of this research suggest some issues in the field of social communication. First of all, it seems crucial that social cause advertising researchers and advertisers stay in touch with developments in emotion research for rapidly developing fields such as experimental psychology and neuroscience.

Neurophysiological measures may be a useful and objective supplement to subjective and declarative data. When combined, these two forms of modality may enable marketers to represent both explicit and implicit consumer reactions to persuasive advertising (Damasio, 1994; LeDoux, 1994; Zaltman, 2003).

It is important to analyse the gap between verbal and psychophysiological responses. When the difference between explicit and implicit responses is minimal, one can be confident of the accuracy of the results; instead, when the difference is remarkable, further investigation may be necessary. Hence, we propose that a joint application of self-report and physiological measures may lead towards a wider interpretation of the emotional responses to advertising elements, rather than using either measure alone. Furthermore, in other sociocultural contexts, incongruent results may emerge between explicit and implicit measures, thereby SC and EMG may prove helpful to detect an emotional reaction that the subject may not feel free to express verbally.

Indeed, we do not suggest that the new shall replace the old; the aim is rather to complete the classic techniques of investigation. A full understanding of human behaviour requires knowledge of the features of conscious experience as well, to be achieved through the use of self-report or interviews.

A critical reflection of intervention and communication approaches for promoting a real behavioural change is required at this point in order to support social relevant themes such as FGM. Nevertheless, although significant efforts have been made to address the FGM-issue, and international and national policy statements have called for an end

to FGM, which has been recognised as a violation of girls' and women's human rights and an obstacle to gender equality, the World Health Organization claims that about 130 million women worldwide have undergone FGM; and an additional two million girls become mutilated every year.

Looking at this relevant social issue, it is worthy to highlight that media campaigns play a crucial role in conveying the proper information among communities, promoting dialogue, integration, and change.

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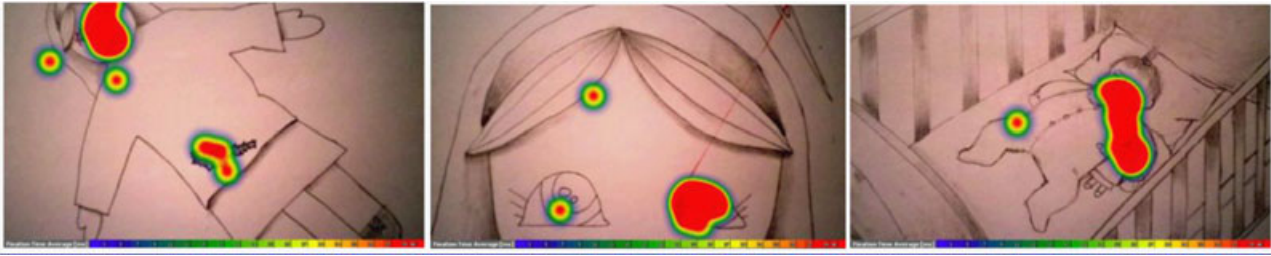
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APPENDIX A

Social Ads 1 (duration: 150 s)



The communication strategy of this ad is based on a nonviolent code: drawings combined with music and with messages written in Italian. The background music in the video leads to sadness and melancholy.

The AD 1 “Rag Doll” tells the story of Fadi, a young Ethiopian woman. The doll, which accompanies Fadi since childhood, shows wounds on the body.

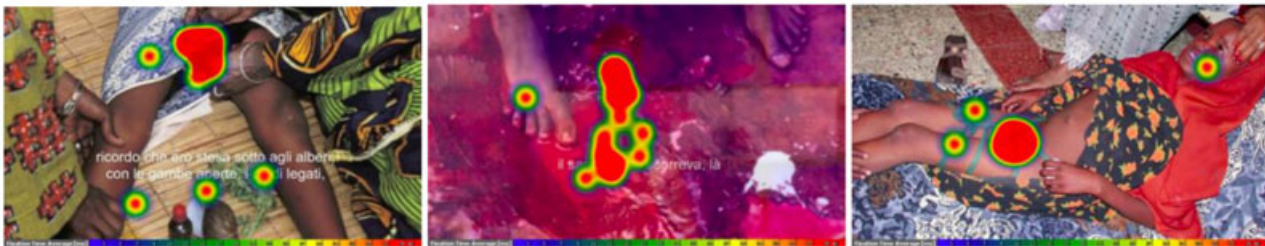
Fadi, who migrated to Italy, decided to mend his wounds and to donate that same doll to her daughter.

A different future awaits the newborn that will not suffer what her mother suffered.

The message is of acceptance of a culture but at the same time a refusal to maintain a practice considered inadmissible. The ad ends with this subtitle: “I will not tear the pages of our past, but turn a new page and move forward.”

APPENDIX B

Social Ads 2 (duration 180 s)



The AD 2 “Every 11 seconds” is a social communication in French subtitled in Italian.

The communication strategy of this ad is based on a violent code, as can be seen in the images above, that elicits a strong emotional impact. The video shows images of girls subjected to mutilation ritual to raise public awareness about it.

Images of a bloody scissors and cut flowers are accompanied by screams of girls.

An African woman reminds us that every 11 s, a child in the world suffers genital mutilation and tells us what she experienced on her own body.

APPENDIX C FOLLOW-UP INTERVIEW

Good Morning, I am Dr. XXX and I am calling on behalf of Behavior and Brain Lab. Can I ask you a few things about our lab?

1. Have you ever heard about Behavior and Brain Lab?
2. Have you ever taken part to our experiment?
3. Do you remember about the experiment?

4. So, you talk about social advertising video, do you remember how many videos you have seen?
5. Do you remember which was the topic of the two videos?
6. Can you talk to me about the videos?
7. Can you remember details about the videos?
8. Which was the one that impressed you more?
9. Would you use the spot 1 or the spot 2?