Emotional Network in Control of Cognitive Processes in Advertisement

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ABSTRACT
The theoretical background for the presented research are network models of memory and emotion, and the prospect theory. The research examines cause-effect relationships between emotions elicited by the advertisement and the processes of evaluation and memory for ads appealing to positive or negative emotions. Structural equation modeling has been applied as a method of statistical analysis. The two studies show the significance of emotions and the specificity of autobiographical ads and PSA’s (non-commercial advertisements), with reference to a consumer’s personal gains and losses in the light of the prospect theory.

INTRODUCTION
One of the crucial factors determining the way consumers process information of advertisement are emotional reactions elicited by ads. Ad-triggered emotions, transferred to the ad, can influence the evaluation and memory of both an ad and the advertised brand (Burke, Edell, 1989; Holbrook, Batra, 1987; Morris et al., 2002; Escalas et al., 2004). Recent studies suggest that positive and negative emotions have an asymmetrical effect on reactions to ads (Moore, Hutchinson, 1983; Brown et al., 1998). However, different roles of positive and negative emotions in evaluation and memory of ads have not been explained yet (Cotte, Ritchie, 2005; Faseur, Geuens, 2006; Tanner, 2006). This problem can be solved in the light of network models in which relationships between emotion and cognition are considered. The role of positive and negative emotions in evaluation and memory of advertisement can be modified by the context of ad perception and by instrumental or prosocial motivational factors. Friestad and Thomson (1993) showed that memory of ads was dependent on the context in which they were perceived (ad-directed processing vs. brand-directed processing). Emotional advertisements were better remembered when perceived in the ad-directed context. Furthermore, Sujan, Bettman and Baumgartner (1993) and Baumgartner, Sujan and Bettman (1992) found that consumers’ autobiographical memories involving products and product usage experiences were affectively charged and retrieval of autobiographical memories influenced evaluation and memory of advertisement. The stronger the emotions (net-effect) elicited by the ad were, the better the ad and brand were evaluated. The better the brand evaluations, the better memory for brand claims was, but only in strong argument conditions. Relationships between positive vs. negative emotions and evaluation and memory of ads can be analyzed in the light of gains and losses which the consumer incurs by purchasing or not purchasing the product. Such an approach to research matches the prospect theory by Kahneman and Tversky (1979).

The goal of our research is to investigate cause-effect relationships between emotions elicited by the advertisement and the processes of evaluation and memory for ads appealing to positive or negative emotions. Our purpose also is to show the significance of emotions and the specificity of autobiographical ads and PSA’s (non-commercial advertisements), with reference to a consumer’s personal gains and losses in the light of the prospect theory.

THEORETICAL BACKGROUND

Network organization of emotions
Relationships between emotion and cognition can be well explained by network models of the mind. In the PDP model, McClelland (1995) explains information processing of objects and events, but not emotions. Parallel and cooperative processing of emotional information were emphasized by Suarez Araujo and colleagues (2005). Bower (1992) took emotions into consideration as well as events and objects in his network model of memory. A constructivist and contextual approach to emotion and memory was presented by Parrot and Spackman (2000). Panksepp’s (2000) studies indicated the cooperation of emotional and cognitive processes. The emotional system can be considered as a network structure as well as in other perspectives. There are neurobiological, psychophysiological and psychological arguments that systems responsible for processing positive and negative emotions are independent (Cacioppo, Berntson, 1994; Cacioppo, Gardner, 1999). Research into influences of positive and negative emotions on cognitive processes showed that positive affect improved creative problem solving: it led to cognitive elaboration and flexibility, giving rise to more thoughts, more nontypical thoughts, and innovative solutions to problems. Therefore, it can be claimed that positive affect activates a wide area of a cognitive network. On the other hand, research on negative affect showed that the negative affect is not simply the opposite of positive affect in either its behavioral or cognitive effects. Negative affect increases vigilance more than positive affect, while activating a narrower area of the cognitive network (Ashby, Isen, Turken, 1999).

Positive and negative ads and gains and losses
According to the prospect theory by Kahneman and Tversky (1979), ‘losses loom larger than gains’. Kahneman and Tversky’s research has been concerned mainly with monetary outcomes. However, the authors suggest that the theory is applicable to choices involving other attributes. Positive and negative emotions in advertisement can be significant not only in evaluation and memory of ads but also in experiencing satisfaction of purchase (gains) or dissatisfaction with not having purchased the product (losses). Therefore, one can expect that ads can elicit strong negative emotions and high sensitivity by suggesting what consumers can lose by not purchasing the product, whereas ads implying gains by purchasing the product elicit moderate positive emotions and low sensitivity to the ad. The effect of gains and losses in advertisement can be modified by different motivational factors elicited by both commercial and non-commercial ads. The effect is stronger if gains and losses concern the consumer directly, which is related to instrumental motivation.

Theoretical model
On the basis of the assumptions presented above we propose a theoretical model for print advertisement (Figure 1). Our model is based on Burke and Edell’s (1989) research which examined relationships between emotions elicited by advertisement and evaluation of the ad and brand. In Burke and Edell’s analyses the fit of structural models to the empirical data was excellent.

In our model, advertisement, as an emotional stimulus, activates nodes in the emotional network. Emotions elicited by the advertisement influence ad and product evaluation, and memory. Furthermore, according to the effect of familiarity, familiar stimuli are more attractive (Zajonc, 1980). Therefore, one can expect that the more familiar the advertisement, the more positive the evaluation of the product. Since we tested memory for brand claims, we did not expect the effect of ad evaluation on memory: Even in
positively evaluated ads, brand claims can be processed peripherally. Our model can be interpreted as the emotional-cognitive network, sensitive to the context and emotions elicited by the ad.

STUDY 1

Emotions in evaluation and memory of the autobiographical ad

Personal experiences stored in autobiographical memory have specific properties which are important for research into autobiographical advertisement. First, autobiographical memories can be considered a constructive process. Therefore, autobiographical memories are sensitive to the context in which they are retrieved. Second, accessing autobiographical memories is likely to enhance the involvement in communicated information. In autobiographical advertisement emotions are elicited by autobiographical text, referring to personal experiences. Krugman (1965, 1967) emphasized the importance of accounting for the personal experiences that individuals accessed during exposure to an advertisement and assumed that autobiographical memories have an important influence on the process of product evaluation. According to Baumgartner, Sujan and Bettman (1992), encouraging autobiographical memories with an advertisement influences evaluation and memory of the ad. Personal involvement encouraged by the advertisement can also be significant for perceiving gains or avoidance of losses while in possession of the product. This perception depends on whether the advertisement refers to positive or negative autobiographical memories.

In Study 1 we examine cause-effect relationships between emotions elicited by the advertisement and the processes of evaluation and memory for ads appealing to positive or negative emotions. We also investigate the significance of the context in which the ad was perceived (ad-directed processing vs. brand-directed processing) and the significance of positive vs. negative emotions elicited by the ad in its evaluation and recall. Finally, we analyze the results obtained with reference to the consumer’s personal gains and losses in the light of prospect theory.

Participants, Materials, and Procedure

One hundred and eighty-eight undergraduate students, age 19–25, took part in Study 1. Participants were volunteers, from universities and colleges in Warsaw.

Two printed advertisements were designed for the purpose of the experiment. Both ads presented a DVD case. Brand claims of fictitious brand General Master were located at the bottom of each ad. The two ads included different autobiographical texts, one referring to positive and the other to negative autobiographical memories.

The Emotional Network Scale was used to measure emotions elicited by the advertisement. The construction of our scale was inspired by Burke and Edell’s (1989) The Feelings Scale and Sujan, Bettman and Baumgartner’s (1993) Net Affect Scale. The categorical and network structure of emotions constituted the theoretical background for the Emotional Network Scale. Multidimensional scaling methods were applied to establish the network structure of emotions. Psychometric properties of the 21-item scale were described by Grochowska and Falkowski (in print). Three indices of emotions were analyzed: positive emotions, negative emotions and the difference between positive and negative emotions (net-affect). There were 13 and 8 items for positive and negative emotions, respectively. Participants marked their answers on the 7-point Likert scale.

The Ad Evaluation Scale was used to measure the subjects’ assessment of the ads. In constructing the scale a principal components analysis yielded two factors: positive and negative evaluation. In preliminary studies three ads (positive, negative, and neutral) were investigated and adjectives loaded more than .60, shared by the three ads, were selected. Thus, the scale consisted of 32 adjectives, 16 for positive and 16 for negative evaluation. The index of ad evaluation was the difference between sums of positive and negative items, according to the methodology described by Burke and Edell (1989).

Product evaluation was assessed on four 100-millimeter-long scales, in which 0 was low and 100 was high: satisfaction with, and
quality, durability, and utility of the product advertised. The four measures were totaled to form an overall measure of product evaluation. Cronbach-alpha was .94.

**Brand claim recall.** Subjects were asked to list all the brand claims that they could recall from the ad. The number of brand claims correctly recalled was counted. The recall score could vary between 0 and 10.

**Procedure and methods of statistical analysis**

The study was conducted individually, in laboratory conditions. Subjects were asked to either evaluate the merits of the advertised brand (brand-directed processing) or to judge the merits of the actual advertisement for the brand (ad-directed processing). At first, a buffer ad was implemented. Then, forty seconds were given to view an experimental advertisement. Two groups viewed the ad referring to positive autobiographical memories and the other two viewed the ad referring to negative. Then the subjects were asked to list all the brand claims they could recall from the advertisement, in the order that first came to mind. They were then asked to fill The Emotional Network Scale, The Ad Evaluation Scale and product evaluation scales. Assumptions on the network structure of cause-effect relationships between analyzed variables allowed the testing of the theoretical model applying structural equation modeling as a method of statistical analysis.

**Results**

**Emotions in memory and evaluation of autobiographical ads**

The proposed model of effects of emotion on evaluation of ads and products and on memory for brand claims, similar to Burke and Edell’s (1989) models, was tested in structural equations modeling. The system was tested by translating the variables presented in Figure 1 into a system of structural equations expanded to include the positive and negative emotions as well as the difference between them (net-affect) elicited by the ad, for the two ads referring to positive or negative autobiographical memories. In this way, the six empirical models were tested. Structural equation models for the ad referring to positive autobiographical memories are presented in Figure 2.

As we can see in Figure 2A, net-affect elicited by the ad referring to positive autobiographical memories had a direct effect on the ad and product evaluation. Although emotions elicited by the ad had no direct influence on the memory of brand claims, the fit of the model to empirical data was worse after removing the path between emotions and the memory of brand claims.¹ This means that cause-effect relationships presented in the model are significant for the entire model. Furthermore, there was an effect of brand claims on product evaluation (at the level of statistical tendency, p=0.08). Familiar stimuli were evaluated more positively. Thus, there were three determinants in product evaluations in the analyzed model: memory of brand claims, ad evaluation and emotions elicited by the ad. Similar regularity could be observed in the ad referring to positive autobiographical memories, in the case of eliciting positive emotions (Figure 2B). But this effect did not occur in the case of eliciting negative emotions (Figure 2C) nor in the ad referring to negative autobiographical memories (Figure 3). Thus, positive emotions activated a wide area of the cognitive network. On the other hand, negative affect was not simply the opposite of positive affect in its cognitive effects.

Negative emotions elicited by the ad (Figure 2C and 3C) had a direct effect on one variable only: evaluation of the ad. Negative emotions had an effect on the negative ad evaluations but not on the evaluations of the product itself. In product evaluation subjects relied upon ad evaluation. Relationships between negative emotions and the memory of brand claims and the evaluations of the product were not significant in this model. However, after remov-

¹Akaike’s Information Criterion (AIC), (Akaike 1987), has been used for selecting the best model among a number of candidate models. We compared AICs for six models respecting the path between emotions and the memory (-1.729; -1.9; -1.68; -1.62; -0.96; -1.991) to AICs for six models after removing this path (-2.369; -3.739; 39.75; 54.05; 17.23; 34.01, respectively). The model that yields the smallest value of AIC is considered the best. Models respecting the path between emotions and the memory had lower AICs than the models after removing this path.
Emotions in evaluation and memory of autobiographical ads, in the two contexts of ad perception

It was expected that the structure of relationships between emotions elicited by the ad, evaluations of the ad and brand, and brand claims recall were modified by the context of ad perception. In the following analyses the theoretical model was tested for the data obtained in two contexts of ad perception: ad-directed and brand-directed processing. In subsequent analyses, emotions elicited by the ad (positive emotions, negative emotions and net-affect), in two contexts of ad perception, for ads referring to positive vs. negative autobiographical memories, were taken into consideration. Thus, the $\chi^2$ tests were used to estimate the fit of empirical data to twelve theoretical models (Figure 4).

An interesting regularity may be seen in Figure 4: in models for ads referring to positive autobiographical memories the fit of the model to empirical data was much worse than in models for ads referring to negative autobiographical memories. This means that...
subjects were more sensitive to losses (negative, threat message) than to gains (positive message). This result is in accordance with prospect theory by Kahneman and Tversky (1979)—“losses loom larger than gains.” The same product presented in the perspective of gains vs. losses was remembered and evaluated differently. Moreover, in ads referring to positive autobiographical memories, there was an effect of brand claims memory on product evaluation in the ad-directed context, while in the brand-directed context this relationship was not significant. This means that relationships between memory of brand claims and product evaluation in the ad-directed context had an emotional nature—familiar stimuli were more attractive. In the perspective of marketing application one can say that through positive emotions the ad is better remembered, whereas negative emotions cause deeper, more thorough information processing.

STUDY 2

Emotions in evaluation and memory of PSA’s (non-commercial ads)

The particular feature of Public Service Advertisements is that they usually elicit negative emotions. PSA messages often refer to anxiety or compassion. Appeals to anxiety encouraging the viewer to take action for his own good (for example, to give up smoking) are often used in PSA’s. Appeals to compassion are efficient in PSA’s encouraging viewers to help others (e.g. to support starving children). According to Bagozzi and Moore (1994) negative emotions elicited by the PSA lead to empathic reactions and facilitate making decisions to help others.

The aim of Study 2 was to investigate cause-effect relationships between emotions elicited by the PSA and the processes of evaluation and memory for such ads. The significance of positive and negative emotions in evaluation and memory of PSA’s was also examined. Unlike Study 1, the persuasive message did not refer to personal gains or losses.

Participants, Materials, and Procedure

Ninety-eight undergraduates and postgraduates participated in Study 2. Participants were volunteers, from Warsaw and Lodz universities.

Two print public service advertisements were designed for the purpose of experiment. Both ads presented the logo of the fictitious foundation “Loving Bears”, its slogan and information about the campaign. The two ads presented different photographs: one referring to positive emotions (showing a healthy and cheerful child) and the other to negative emotions (showing a sad and scruffy child). Emotions elicited by the ads were measured with The Emotional Network Scale.

Advertisement and the campaign (advertised idea) evaluations were measured on five 7-point adjective scales adapted for PSA’s.

An index of memory for the ad and the campaign was a sum of scores on questions on the feeling of familiarity of the ad and campaign.

Procedure and methods of statistical analysis. The study was conducted individually. Each participant was presented one advertisement. One group viewed the ad referring to positive emotions and the other to negative emotions. Then the subjects were asked to fill The Emotional Network Scale, scales for ad and campaign evaluation, and answer the questions on familiarity of the ad and campaign. Structural equation modeling was used as a method of statistical analysis.

Results

The theoretical model was tested by translating the variables presented in Figure 1 into a system of structural equations expanded to include the positive and negative emotions as well as the difference between them (net-affect) elicited by the ad, for the two PSA’s referring to positive or negative emotions. That way, all six empirical models were tested. Structural equation models for the ad referring to positive emotions are presented in Figure 5, and to negative emotions, in Figure 6.
As we can see in Figures 5 and 6, there was only an effect of emotions on the evaluation of the ad and the campaign when the ad referred to positive emotions, but not to negative. Whereas in the case of the ad referring to negative emotions, an effect of emotions was observed on the feeling of familiarity with the ad and the campaign. The more positive the emotions elicited by the ad presenting a sad and scruffy child, the more familiar the ad and the campaign were reported to be. However, the foundation was fictitious and the ad was constructed for the purpose of the experiment. In the case of the ad presenting a healthy and cheerful child, the evaluations of the ad and the campaign were based on emotions. Whereas in the ad presenting a sad and scruffy child evaluations of the ad and the campaign were based on cognition – i.e. the feeling of familiarity of the ad and the campaign.

Figure 7 presents the fits of the model to empirical data ($\chi^2$) for PSA’s referring to positive and negative emotions.

When the ad was not coherent with the problem advertised (presenting a healthy and cheerful child), the fit of the theoretical model to the empirical data was better than in the case of the ad coherent to the problem advertised (i.e. presenting sad and scruffy child). This means that people are more sensitive to dissonant stimuli. The ad presenting a cheerful child could elicit a dissonance, and cause astonishment and more careful attention to the ad.

**FINAL REMARKS**

The research showed that positive emotions activated a wide area of the cognitive network. Therefore, one could expect that more cues of ad recall are available. On the other hand, negative emotions activated a smaller area of the cognitive network and elicited high sensitivity to the perceived ad, so messages in the advertisement are processed more thoroughly. Therefore, one can say that cooperation of positive and negative emotions enables better memory of the ad. It is worth noting that only positive emotions are transferred to product evaluation; negative emotions are not significant here.

Public service advertisements which elicited dissonance and high sensitivity, caused astonishment and more careful attention to the ad. This way the persuasive message in the ad could be remembered better.

Commercial ad referring to losses was processed more sensitively than the ad referring to gains. This result is congruent with prospect theory by Kahneman and Tversky (1979). This effect appeared only in the case of persuasive messages referring to personal gains and losses. The results of our research suggest that advertisers can control the form of persuasive messages to influence the perceived satisfaction of purchase (gains) or dissatisfaction with not having purchased the product advertised (losses).

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FIGURE 7
Values of fits ($\chi^2$) for models of PSA’s referring to positive and negative emotions


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