



How to capture the heart? Reviewing 20 years of emotion measurement in advertising

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ABSTRACT

In the latest decades, emotions have become an important research topic in all behavioral sciences, and not the least in advertising. Yet, advertising literature on how to measure emotions is not straightforward. The major aim of this article is to give an update on the different methods used for measuring emotions in advertising and to discuss their validity and applicability. We further draw conclusions on the relation between emotions and traditional measures of advertising effectiveness. We finally formulate recommendations on the use of the different methods and make suggestions for future research.

INTRODUCTION

No advertising researcher, be it a practitioner or an academic, doubts that emotions are an important factor in the advertising process. In models on “how advertising works”, emotions have never been completely absent. According to the earliest advertising model AIDA, introduced by Strong (1925), an emotional reaction (here: desire) occurred only after consumers had experienced interest for the ad or the product. This led to the widespread conception that the advertising process starts with attention (A) and cognitive processing (Information), which leads to affect (Desire), and then generates behavior (Action). Models based on this order of processing are generally called “hierarchy of effects” models and dominated advertising literature for years (for a review: Vakratsas and Ambler, 1999).

From the 1980s on, the role of emotion changed. Driven by the work of Zajonc (1980), who argued that emotion has primacy over and can function independent of cognition, emotions gained renewed attention and were being accepted as an important mediator of cognitive and behavioral consumer responses to advertising (Batra and Ray, 1986; Edell and Burke, 1987; Holbrook and Batra, 1987).

In the latest decades, considerable progress has been made in the study of emotions. The influential work on emotions by neuroscientists like Damasio (1994) and LeDoux (1996) has led to the general conception that emotions are not a useless by-product but are essential for rational thinking and behavior. Building on these insights, researchers in various disciplines including marketing and advertising have emphasized the great importance of emotions for human behavior and decision making (Ambler and Burne, 1999; Du Plessis, 2005; Hall, 2002). According to these views, emotions dominate cognition and need to be considered as the most crucial factor in the advertising process. Emotional reactions function as the gatekeeper for further cognitive and behavioral reactions.

Giving the importance of emotions in the advertising process, accurate measurement of emotions is essential. However, measuring emotions is not easy. Throughout the years, emotional reactions to advertising have been measured in numerous ways. Although most authors acknowledge the importance of emotions in the advertising process, Vakratsas and Ambler (1999) argued that there is more work needed to calibrate measurement methodologies of emotion in advertising.

The key purpose of this article is to give an overview of the different methods used for measuring emotions in advertising and to discuss their applicability and validity. It is important to notice that by “advertising research” we mean research carried out by both practitioners and academics. Consequently, we aim to formulate useful suggestions on the measurement of emotions that are relevant both for practitioners and academics. We further draw conclusions on how the relation between emotional reactions and traditional measures of advertising effectiveness, like attitude towards the ad (Aad), attitude towards the brand (Abr), purchase intention (PI), and recall or recognition, can be contingent on the measurement instrument that is used.

The most relevant articles on the measurement of emotions published in premiere advertising or marketing journals (and occasionally working papers) are summarized in a table. Giving the abundance of articles available, we have limited ourselves to articles published during the last 20 years. For a review on earlier articles about the measurement of emotions in advertising, we refer to Wiles and Cornwell (1990).

1. DIFFERENT TYPES OF EMOTIONS

We first need to clarify some issues about the concept of emotion. A diversity of reactions is regarded as an emotion. For example, both the positive arousal that attracts men’s attention to ads showing seductive women or the hope one may experience after seeing an ad about revolutionary dieting pills, are classified as emotional reactions. However, those reactions

involve different mental processes. More concretely, the positive arousal in the first example occurs automatically, whereas the hope in the second example is determined by cognitive processes. We therefore need to make a distinction between two types of emotions that operate on a continuum depending on how much cognitive processing they require before the emotion is constituted.

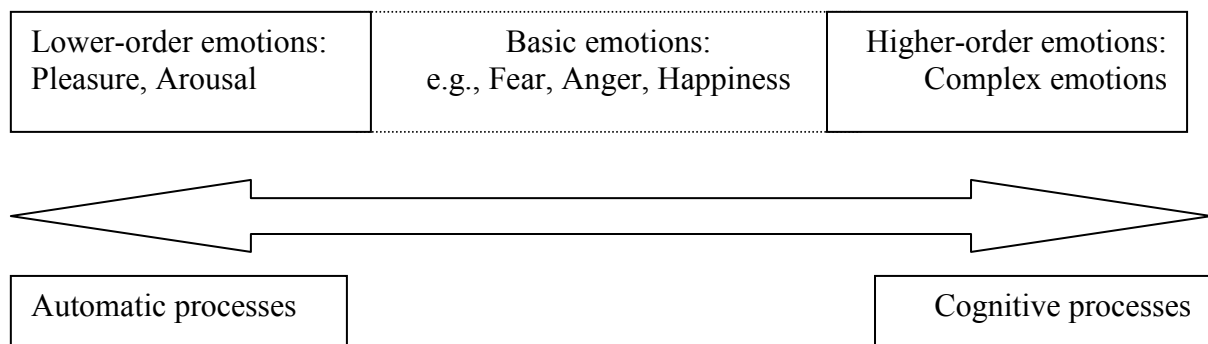
At the left end of the continuum, we place emotions that occur automatically, referred to as “lower-order emotions” (LeDoux, 1996; Zajonc, 1980). These are spontaneous and uncontrollable emotional reactions (Shiv and Fedorikhin, 1999). Rossiter and Bellman (2005) call these “type 1” emotions. These types of emotions mainly involve pleasure and arousal reactions that do not require to be cognitively labeled as a specific emotion. For example, ads that, be it unconsciously, evoke a pleasure or arousal reaction, will receive more attention. When attention is evoked by a positive emotional reaction, it leads to further focusing and learning about the brand’s benefits and, possibly, acceptance of the ad’s message (Van Raaij, 1989). However, in case of low involvement products (e.g., a food snack), attention together with pleasure feelings can immediately lead to acceptance of the message, without explicit learning. Moreover, the ad processing itself is often an unconscious process (Heath and Nairn, in press).

At the right end of the continuum, we place emotions that depend on deeper cognitive processing of the situation, referred to as “higher-order emotions” (Lazarus, 1991; Frijda, Kuipers, and ter Schure, 1989; Smith and Ellsworth, 1985). In a similar vein, Rossiter and Bellman (2005) call these “type 2” emotions. These types of emotions are more complex than lower-order emotions in the sense that higher-order emotions need to be consciously labeled as a specific emotion.

However, these two extremes do not yet solve the entire emotion puzzle. Some basic emotions, like fear, anger, and happiness, are situated somewhere in between lower-order and

higher-order emotions. For example, standing eye in eye with a lion will automatically fulfill you with fear. On the other hand, fear can also be felt after conscious appraisal of a situation. For example, after serious mistakes at work, people may experience fear about losing their job. This type of fear is not constituted automatically but will be felt only after cognitive reflections of the situation. Because basic emotions can be experienced either automatically or after cognitive appraisal, we place them in the middle of the emotional continuum (Figure 1).

Figure 1. The Emotional Continuum



2. OVERVIEW OF THE DIFFERENT MEASUREMENT METHODS

For the measurement of emotional reactions to ads various measurement instruments are available. To date, advertising literature is not straightforward on what measurement instrument provides the most valid emotion measurement. In the following paragraphs, we summarize and evaluate the different emotions measurement methods cited in advertising literature. We will place special emphasis on the difference between lower-order and higher-order emotions when choosing the most valid technique.

We compare two major types of methods to measure emotions: self report measures and autonomic measures. Both methods have been applied in advertising research to register

emotional reactions to advertising stimuli. However, the two methods are fundamentally different. Self report measures focus on introspective reflections about the emotions felt with respect to an advertising stimulus. On the contrary, autonomic measurements concentrate on continuous emotional reactions that are not distorted by higher cognitive processes.

1. SELF REPORT MEASURES

Throughout the years, self report measures have been extensively used to measure emotional reactions to advertising. Self report measures register the respondent's subjective feeling. A "subjective feeling" can be defined as the consciously felt experience of emotions as expressed by the individual (Stout and Leckenby, 1986). In general, we distinguish three types of self report methods that all measure subjective feelings: verbal self report, visual self report, and moment-to-moment rating. In the following paragraphs, we will discuss the three sub-methods in detail.

VERBAL SELF REPORT

In verbal self report, individuals are asked to express their emotions verbally by means of open-ended questions or to rate their emotions on a battery of emotion items by using semantic differential or Likert scales. In advertising literature, this method was initially applied in the eighties by researchers who aimed at developing an inventory of emotional reactions to ads.

In general psychological emotion research, there are two major approaches to the study of emotions: the "dimensional" approach and the "basic emotion" approach. According to the dimensional approach, the full spectrum of human emotions can be described by three independent, bipolar dimensions: Pleasure, Arousal and Dominance (PAD) (Mehrabian and Russell, 1974). In this view, individuals are in a constant state of emotion that can be

expressed as a combination of these dimensions. As a tool to measure these dimensions, Mehrabian and Russell (1974) developed a scale with multiple emotion-adjectives representing the three PAD-dimensions.

Alternatively, the basic emotion approach describes the full spectrum of human emotions as a mixture of (a limited set) of basic emotions. Those basic emotions are considered to be universal and possess distinct adaptive values (Ekman, 1992). Examples of basic emotions are happiness, surprise, sadness, fear, anger and disgust. Several emotion researchers developed a list consisting of specific basic emotions and accordingly made a scale to measure the occurrence of these emotions in various contexts. Most important scales measuring specific emotions are Plutchik's 'Emotion Profile Index' (1980) and Izard's 'Differential Emotion Scale' (1977). Both scales have been extensively used in psychological research on emotions (e.g. Kozmar et al., 2003; Susman et al., 1998).

Verbal scales emerging from both the dimensional and the basic emotion approach have been adapted to capture emotional reactions in an advertising context. The dimensional approach was applied by Olney, Holbrook, and Batra (1991). Plutchik's Emotion Profile Index was introduced in advertising research by Zeitlin and Westwood (1986) and Izard's Differential Emotion Scale was applied in an advertising context by Allen et al. (1988). Other researchers have applied verbal self report to develop their own typologies of emotions in advertising (Batra and Ray, 1986; Edell and Burke, 1987; Holbrook and Batra, 1987; Burke and Edell, 1989; Mano, 1996; Pieters and Klerk-Warmerdam, 1996).

Havlena and Holbrook (1986) compared the value of the two approaches in a consumer setting. They found the PAD-dimensions to capture more information about the emotional character of a consumer experience than Plutchik's eight basic emotions. It is interesting to notice that some authors, in an attempt to incorporate an empirically based classification of emotional reactions to advertising, found dimensions comparable to the PAD-dimensions. For

example, Holbrook and Batra's typology (1987) consists of three dimensions: pleasure, arousal and domination. Likewise, the emotion classification of Pieters and Klerk-Warmerdam (1996) led to a similar three-dimensional structure: pleasantness, intensity, and direction.

Following this, we can conclude that in verbal self report measurement the dimensional approach seems to prevail over the basic emotion approach. This may not be very surprising, given the fact that the studies cited here mainly focused on immediate reactions to ads which typically involve lower-order pleasure and arousal reactions as outlined in the dimensional approach.

Currently, the development of a typology of emotional response is no longer the main focus of advertising research on emotions. Verbal self report is now mostly being applied as a set of emotion adjectives that need to be scored by means of semantic differentials or Likert scales. This form of verbal self report has several advantages. It's a simple, cheap and quick method to investigate large-scale emotional responses to a set of advertising stimuli.

However, there are some important limitations concerning the reliability and validity of this method. Although most authors report their verbal emotion scales to be sufficiently reliable, emotion scales often consist of a long list of emotion adjectives. Rating a large set of ads on such a list may be cumbersome and produce fatigue in the respondents.

When it comes to the validity of this method, the most important limitation involves an inevitable amount of cognitive processing required in verbal self report that may distort the original emotional reaction in case of lower-order emotions. For higher order emotions, this is not disadvantageous since cognitive appraisals are needed to register these types of emotions.

Respondents may also be unable to report their emotions because they are not aware about how they exactly feel or, respondents may be unwilling to report their emotions because of social desirability concerns. Combining these constraints with verbal self report, it can be

argued that a perception of emotional response may be measured rather than the emotional response itself.

Another issue involves the fact that verbal self report is retrospective. It can measure emotional reactions only after the advertising stimulus is shown, not while it is presented. This is an important issue in the copy testing of commercials in which it is important to know which part of the commercial evokes the most intense emotional reaction.

VISUAL SELF REPORT

Similar to verbal self report, visual self report instruments measure subjective feelings. Instead of relying on verbalizations or a list of emotion words, responses of visual self report are based on cartoon-like figures representing different emotions or emotional states. In advertising literature, we take notice of two visual self report instruments: the – most frequently used – SAM and the – more recent – PrEmo.

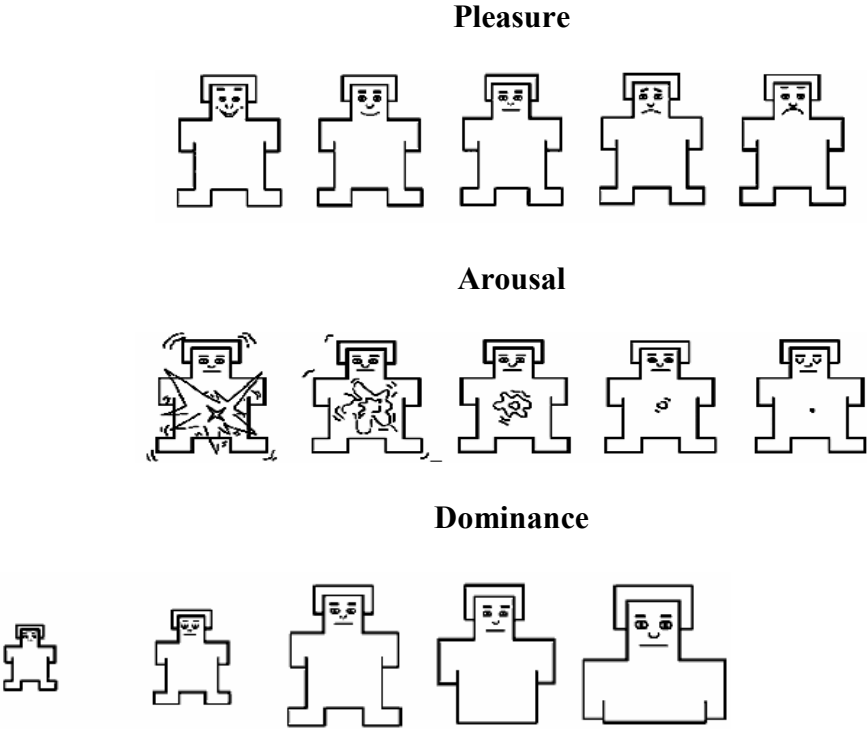
The Self Assessment Manikin (SAM), developed by Lang (1980), is a visual self report instrument that relies on Mehrabian and Russel's PAD-dimensions (1974). Instead of rating a set of emotion-adjectives for all three PAD-dimension, Lang (1980) created a set of five figures for every dimension (see figure 1). Accordingly, for every single dimension respondents have to indicate which figures best represents their emotional state (e.g., after seeing a picture).

SAM was introduced in advertising research by Morris and colleagues (1994, 1995, and 1998). Later, Morris et al. (2002) developed AdSAM® in which 232 emotion words were scored on SAM. These emotion words are plotted in a two-dimensional space with pleasure and arousal as the two axes. As a result, emotional reactions to ads can be compared to these emotion words. This enables researchers to visually match lower-order pleasure and arousal reactions to specific higher-order emotions.

Due to a lack of effects found on the dominance dimension, this dimension is often dispensed with when reporting PAD or SAM results. This point was already acknowledged by Russell (1980) and later by Olney, Holbrook, and Batra (1991).

Morris et al. (2002) applied AdSAM® to measure emotional responses to a large (n=240) and various set (TV, print, radio) of advertising stimuli. They conducted an extensive multivariate analysis including, besides emotional reactions, other measures of advertising effectiveness: cognitive attitude (including beliefs and knowledge) and behavioral measures (including Abr and PI). Their findings reveal that, in comparison with cognitive attitudes, emotional reactions to an ad have a stronger effect on behavioral measures evoked by the ad. Morris et al. (2002) therefore conclude that, when using the visual self report measure AdSam®, emotions dominate over cognitive aspects in predicting behavioral attitudes like brand attitude and behavioral intentions like purchase intention.

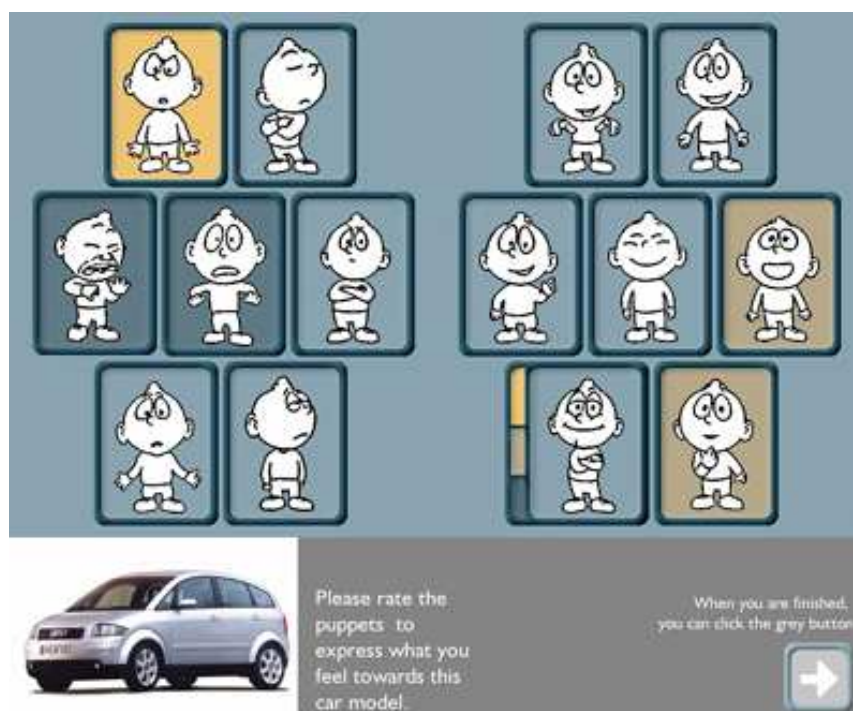
Figure 2. Self Assessment Manikin (Lang, 1980; Morris, 1995)



Recently, Desmet (2002) developed the visual measurement instrument PrEmo. Instead of static figures, PrEmo includes 14 animations of 1-2 seconds. Each animation represents a specific emotion. In total, PrEmo comprises seven positive emotions (desire, pleasant surprise, inspiration, amusement, admiration, satisfaction, and fascination) and seven negative emotions (indignation, contempt, disgust, unpleasant surprise, dissatisfaction, disappointment, and boredom). PrEmo is depicted in Figure 2. In the left hand corner the test stimulus is shown and respondents have to indicate how strongly the target stimulus makes them experience each of the 14 emotions represented by the puppets.

An important difference between SAM and PrEmo is that with PrEmo more than one specific emotion can be registered. PrEmo was initially developed and applied to measure emotional responses to design (Desmet, Hekkert, and Jacobs, 2000; Desmet, 2002) but Ketelaar and Van Gisbergen (2004) applied PrEmo to measure emotions evoked by open versus closed advertisements. They concluded that PrEmo is a user friendly, valid and cheap instrument to measure emotional reactions to advertising.

Figure 3. PrEmo (Desmet, 2002)



When it comes to the advantages and disadvantages of this method, we agree with Morris et al. (2002) that visual self report instruments like SAM are quick and user friendly tools for measuring emotional responses to advertising. This makes visual self report faster and less boring than verbal self report. Also, visual instruments are suitable for cross cultural research and research with children (Morris, 1995).

However, we do not completely agree with Morris et al. (2002) when they state that SAM eliminates the cognitive processing associated with verbal measures. SAM consists of three rows of figures explicitly named as pleasure, arousal and dominance. Further, verbal instructions are necessary when administering SAM. This implies that higher order processes are still involved in the completion of these measures and hence potentially affect the lower-order emotional responses SAM aims to register. We agree that SAM reduces introspection and cognitive processing when compared to verbal self-report. However, it does not completely eliminate it. Consequently, the main limitation of this approach still concerns the cognitive bias: visual self report can only measure perception of an emotional reaction. This may affect the valid measurement of lower-order emotions.

When it comes to the visual measurement of higher-order emotions, PrEmo may be a valuable alternative for the rather cumbersome verbal measurements. Moreover, PrEmo has already proven to be a valid tool for cross cultural emotion research (Desmet, 2002).

MOMENT-to-MOMENT RATINGS

In moment-to-moment ratings respondents are asked to rate an advertising stimulus by indicating in real time the strength of the perceived magnitude of an emotional dimension or a specific emotion in relation to a (neutral) reference point.

In advertising research, the most important moment-to-moment rating tool is the ‘warmth monitor’ (Aaker, Stayman, and Hagerty, 1986). The warmth monitor requires a respondent to

move a pencil down a paper while viewing a commercial, moving the pencil from left to right to indicate how warm his or her feelings are at any given time. To provide a reference point, the warmth monitor contains four scale anchors going from the extreme left (absence of warmth) to the extreme right (emotional – moist eyes). Baumgartner, Sujan, and Padgett (1997) used a similar tool called the ‘feelings monitor’. In this computer based measurement instrument, respondents have to move a cursor from left to right indicating whether the advertising stimulus elicits positive or negative feelings at any given moment. This method can not only be used to capture positive emotional reactions. Rossiter and Thornton (2004) applied the moment-to-moment ratings to measure continuous fear-relief reactions to anti-speeding commercials.

The strength of these moment-to-moment rating instruments is that they can provide an immediate and continuous measurement of emotional response. Additionally, they are cheap and easy to understand and to use. Besides measuring general valence or arousal, any specific emotion can be measured by these moment-to-moment rating instruments (e.g., relief, hope).

Although Vanden Abeele and Maclachlan (1994) found that the warmth monitor was a reliable instrument for measuring warmth in advertising, they raised some questions about the discriminant validity of the measure. When asked to rate other positive emotions than warmth by means of the warmth monitor instrument, these other emotions were found to be strongly correlated with warmth. Vanden Abeele and Maclachlan (1994) suggest that this lack of discriminant validity could also be due to the concept of warmth itself, since it is not a really a discrete emotion and overlaps with several other positive emotions (e.g. joy, love, pleasure). It seems that instead of measuring warmth as a discrete emotion, the warmth monitor rather registers a general indication of positive feelings. In this case, the feelings monitor can overcome this validity problem since it explicitly measures a general state of valence.

OVERALL EVALUATION OF SELF REPORT MEASURES

Self report measures share the advantage of being user friendly and quick measures of emotional response. No complex instruments or programs are required and, moreover, it is possible to administer emotional reactions to a relative large set of advertising stimuli. This makes self report a cheap method that is very suitable for large scale research. Due to these advantages, self report has always been a very popular method for practitioners.

Nevertheless, self report measures suffer from an important limitation referred to as “cognitive bias”. An abundance of research shows that people are not fully aware of a lot of things they do and like in daily life but rather process information automatically and behave spontaneously on many occasions (Bargh and Chartrand, 1999; Chartrand, 2005; Zaltmann, 2003). Furthermore, recent research provides evidence for the existence of emotions that influence behavior without being consciously experienced by the individual (Winkielman, Berridge, and Wilbarger, 2005). Following this, self report measures based on subjective feelings may not always be able to capture lower-order emotions in an accurate way, although these lower-order emotions may have a substantial influence on our decisions.

Further, social desirability concerns can distort self report (King and Bruner, 2000). Especially for sensitive topics (e.g. erotica, charity, racial issues, gender issues, age issues, etc.) respondents are not always willing to report how they really feel. Recently, measures like the “implicit association test”, which overcome a social desirability bias, have been introduced in advertising research (Brunel, Tietje, and Greenwald, 2004). The combination of these types of measurements with traditional self report often reveals an inconsistency between implicit and explicit attitudes (for example for ads with black versus white spokespersons). Moreover, implicit measures may be more valid when measuring emotional responses to ads that contain such sensitive topics.

Social desirability concerns may not only interfere with the valid measurement of lower-order emotions, but also with the measurement of higher-order emotions (e.g. guilt).

However, for higher-order emotions, which are based on cognitive labeling, verbal self report may be indispensable.

2. AUTONOMIC MEASURES

As stated above, emotions are accompanied by (bodily) reactions that are partially beyond an individual's control. These "autonomic" reactions include facial expressions (e.g. smiling, frowning) and physiological reactions (e.g. sweating) primarily caused by changes in the autonomic nervous system (Bagozzi, 1991; Winkielman, Berntson, and Cacioppo, 2001). In fact, the autonomic reactions are manifestations of lower-order emotional processes. Over the years, several instruments have been developed to capture autonomic reactions. Because the validity of self report for measuring lower-order emotions is often biased by cognitive or social desirability constraints, the measurement of autonomic reactions can overcome this problem since they measure emotional responses beyond the respondents' control.

In the following paragraphs we discuss the most relevant autonomic measurement methods that have been used in advertising research: facial expression, heart rate, and skin conductance. We briefly describe the techniques and illustrate them with examples from recent advertising research.

FACIAL EXPRESSION

The experience of some basic emotions like e.g. joy, disgust, or anger is visibly reflected in people's facial expressions. Ever since Darwin (1872), facial expressions have been studied as an indicator of emotional state and as a communicator of emotional information. To derive emotional responses from facial expressions, Ekman and Friesen (1975, 1978) developed the Facial Action Coding System (FACS) that codes visible facial

muscle movements and links it to specific emotions. In advertising research, this coding system was applied by Debaix (1995) in a study comparing verbal emotional responses and coding of facial expressions to a set of commercials. He found that emotional responses deriving from verbal measures had an effect on ad and brand attitudes whereas facial expressions measured by the FACS did not. Derbaix (1995) and other authors (Bolls, Lang, and Potter, 2001; Hazlett and Hazlett, 1999; Ravaja, 2004) argued that the changes in muscular activity evoked by advertising are often too subtle to be measured by the FACS.

Facial electromyography (EMG) is a more precise measure of facial expressions. It has proven to register facial muscle activity when no changes in facial expression were found by means of the FACS (Cacioppo et al., 1986). In facial EMG, two different muscles are of importance: the corrugator and the zygomatic muscle. The corrugator muscle is located above the nose close to the eyebrow and contractions in this muscle are involved in frowning. The zygomatic muscle is situated around the cheeks and controls smiling. In facial EMG electrodes that register muscle contractions are placed on these two muscles.

A study by Lang et al. (1993) showed that there was increased activity in the zygomatic muscle when exposed to positive pictures and increased activity in the corrugator muscle when subjects looked at negative pictures, giving proof that facial EMG is a valid measure of valence. Bolls, Lang, and Potter (2001) showed that the zygomatic muscle activity was larger in radio commercials with a positive emotional tone and the corrugator muscle activity in commercials with a negative emotional tone.

Hazlett and Hazlett (1999) compared emotional reactions to TV commercials measured by facial EMG with results from self report scales. They concluded that, overall, facial EMG was a more sensitive indicator of emotional reactions to TV commercials and that facial EMG responses were closely related to emotion-congruent events during the

commercial. Their results also indicate that, compared to self report, facial EMG measures were more related to brand recall measures administered five days later.

Notwithstanding these general positive evaluations, facial EMG also suffers some limitations (Bolls, Lang, and Potter, 2001). First of all, there is the problem of ecological validity. The measurement of facial EMG has to be completed in unnatural lab settings. Moreover, the placement of electrodes on the face can make subjects draw the conclusion that their facial expressions are under measure. This awareness about what is being measured could make respondents more conscious of their facial expressions which may reduce validity. Facial EMG is also susceptible to noise, for example, evoked by sudden movements of the subject which reduces reliability.

SKIN CONDUCTANCE

Skin conductance (SC) or electrodermal activity is a frequently used measure of activation of the autonomic nervous system (Dawson, Schell, and Filion, 2000). SC gives an indication of the electrical conductance of the skin related to the level of sweat in the eccrine sweat glands. These sweat glands are involved in emotion-evoked sweating. They cover the whole body but are most dense on the palms and the soles of the feet (Dawson, Schell, and Filion, 2000). When there is more activation of the autonomic nervous system, there will be more sweat secretion and consequently a higher level of SC. Since the increase in activation of the autonomic nervous system is an indicator of 'arousal', SC can be used as a measure of arousal (Ravaja, 2004). When measuring SC in practice, electrodes - that register the level of conductance (or inversely: resistance) to a light electrical current - are placed upon the sweat-sensible places of the palm of the hand.

In advertising research the use of SC has been scarce. Some advertising researchers, when testing other emotion measurement methods, have measured SC merely as a validation

measure of other “arousal” measures (Aaker, Stayman, and Hagerty, 1986; Vanden Abeele and Maclachlan, 1994; Bolls, Lang, and Potter, 2001). Based on interviews with market researchers applying SC on the one hand, and practitioner case studies on the other hand, La Barbera and Tucciarone (1995) concluded that, overall, SC seems to be a better predictor of market performance compared to self report measures. However, the cases they report are practitioner cases that were not explicitly designed to compare the predictive or external validity of SC versus self report. Before generalizing their conclusions, well designed experiments will need to find further support for these findings.

In sum, SC can be considered as a sensitive measure of arousal. However, measuring SC and analyzing SC-data requires a lot of practice. It can best be carried out by experts since it has to be set up and analyzed very meticulously in order to obtain valid results. La Barbera and Tucciarone (1995) have formulated some important guidelines concerning equipment and statistical formulas which need to be taken into consideration when designing SC research. They argue that a lot of previous SC studies in advertising (mostly carried out in the 1960s) failed to find effects of SC because they lacked sensitive equipment and accurate statistical protocols. Therefore, these researchers were unable to separate ‘noise’ from the true arousal response.

Further, the major limitation of SC is that it can not determine the direction or the valence of the emotional reaction. It merely measures arousal which can be either positive or negative in valence: either very pleasurable or very repellant advertising stimuli evoke large SC responses (Hopkins and Fletcher, 1994). Also, a lot of individual variation is found when measuring physiological reactions like skin conductance. Psychophysicologists (e.g. Ben-Shakhar, 1985) have developed procedures to standardize skin conductance measures between individuals. These rather cumbersome procedures need to be considered when designing SC-

research. Additionally, other factors like fatigue, medication, women's menstrual cycle, and so forth, can influence SC responses (Hopkins and Fletcher, 1994).

HEART RATE

The beating speed of our heart can be an indicator of various phenomena: attention, arousal, and cognitive or physical effort. In psychophysiological research heart rate is mostly operationalized as the number of milliseconds since the previous heart beat (Lang, 1990).

To distinguish heart rate measures indicating attention to commercials from measures indicating arousal responses to commercials, Lang (1990) looked at phasic (i.e. short term) changes in heart rate for attention and at tonic (i.e. long term) changes as an indication of arousal. She concluded that for both attention and arousal heart rate can be a valid real-time and continuous measure. When attention increases, there is a phasic deceleration of heart rate. Arousal, furthermore, is accompanied by a tonic acceleration in heart rate.

At the same time, heart rate can give an indication of the valence of an emotional response. Compared to neutral stimuli, both positive and negative stimuli first exhibit a phasic decrease in heart rate. At a tonic level, positive stimuli evoke an increase in heart rate while negative stimuli generally lead to a decrease in heart rate (Greenwald, Cook, and Lang, 1989; Cuthbert, Bradley, and Lang, 1996). These findings were replicated in advertising studies using heart rate to measure emotional responses to advertising stimuli (Lang, 1990; Bolls, Lang, and Potter, 2001).

Although previous studies seem to support that heart rate is a valid measure of arousal, valence or attention, one needs to be careful in interpreting heart rate results. Exactly because heart rate can be a measure of different phenomena, interpretation has to be done with caution. For example, a complex thriller can evoke phasic deceleration in heart rate because it requires a lot of attention, on the other hand, the suspense from the thriller can evoke high

arousal and thereby a tonic increasing heart rate. At the same time, because of negative feelings evoked by the thriller, heart rate can decrease due to negative valence. It is therefore not appropriate to use heart rate as the single measurement method of emotional response. However, it can well serve as an additional psychophysiological technique, for example to give an indication of valence when skin conductance is measured (Hopkins and Fletcher, 1994).

Heart rate is mostly not detected directly in the heart but at other - more convenient - places like the finger. Placing a device that registers heart rate on one finger has the advantage that it requires little interference with the subject. In this way, the registration of heart rate can be considered as an easy and cheap way to measure psychophysiological reactions evoked by advertising (Lang, 1994).

OVERALL EVALUATION OF AUTONOMIC MEASURES

Since autonomic measures share the advantage that they can measure emotional reaction in real time without cognitive bias, they seem to provide the most valid tool to measure lower-order emotions. Also, basic emotions can be measured by applying facial EMG since these types of emotions possess distinct facial expressions. Although not yet applied in advertising research, basic emotions of the same valence (e.g. fear and anger) can be distinguished when applying autonomic measurement tools (Sinha and Parsons, 1996).

The concrete implementation and interpretation of those measures is usually less convenient, however. Since some autonomic responses can be an indicator of several aspects of an emotion or of aspects related to emotions (e.g. attention), it is often difficult to establish a clear-cut relation between emotional reactions and autonomic responses. Several authors therefore argue that, for a more accurate interpretation, it is better to use multiple autonomic measures on one respondent at the same time (Bagozzi, 1991; Plutchik, 2003).

Due to these drawbacks, the use of autonomic measures in advertising has been rather scarce (Vakratsas and Ambler, 1999). Nevertheless, the studies by Hazlett and Hazlett (1999) and LaBarbera and Tucciarone (1995) were very promising in showing a difference between self-report measures and autonomic measures in predicting advertising effectiveness, with the last being the most powerful. Although these studies were not explicitly designed to generalize conclusions about the predictive validity of autonomic versus self report measures, they strongly suggest that autonomic measures are promising. We think it is a major challenge for advertising researchers to explore their potential and compare the predictive power of autonomic measures with self-report measures in well designed research experiments.

3. REVIEW TABLE

Table 1 summarizes the most important articles dealing with the measurement of emotion in advertising. Articles are included in the table only when a substantial amount was devoted to the use or development of a research instrument to measure emotions in advertising. Because the measurement of emotional reactions becomes interesting particularly when linked to other measures of advertising effectiveness, the major findings of the different articles concerning the impact of emotions on other measures of advertising effectiveness (- mostly - Aad, Abr, purchase intention, and recall) are summarized as well.

Table 1. Overview of the Emotion Measurement Methods in Advertising Research

1. SELF REPORT MEASURES		
Verbal Self Report		
Study	Method	Other variables included Major Findings
<i>Zeitlin and Westwood, 1986</i> Verbal: Typology based on Plutchik's	-Each primary emotion is measured by 3-4 items. -Score visualized in Plutchik's	No other variables -ER towards advertising can be

Emotion Circumplex - Commercials	emotion circumplex	captured by Plutchik's Emotion Circumplex -reliability: scale items measuring the primary emotions are internally reliable
<i>Stout and Leckenby, 1986</i> Verbal : Own Typology - Commercials	-three progressively involved levels of emotional response: experiential, empathic, and descriptive -measured by an open-ended question, content coded	-Aad, Abr, Ad Recall, PI -ER compared to no ER led to increased ad recall, no difference in Aad, Abr or PI -impact of ER on measures of advertising effectiveness depends on the level of emotional response
<i>Batra and Ray, 1986</i> Verbal : Own Typology -Commercials	-development of typology based on theory (13 emotions) -3 positive emotions further investigated -open-ended questions, content coded	-Aad, Abr, PI -ER have a direct impact on Aad -ER have an indirect impact on Abr and PI -correlational evidence for: ER->Aad->Abr->PI
<i>Holbrook and Batra, 1987</i> Verbal: Own Typology and Dimensional approach -Commercials	-development of typology based on theory (29 emotions) -each emotion represented by 3-4 items -judges rate commercials on all items -factor analysis based on judgment scores yield 3 dimensions: pleasure, arousal, domination	-Aad, Abr -ER mediate effects of ad content on Aad -ER and Aad partially mediate the effects of ad content on Abr
<i>Edell and Burke, 1987</i> Verbal: Own typology - Commercials	-commercials were rated on 69 feeling items -scores were factor analyzed and yielded 3 factors: upbeat feelings, warm feelings, negative feelings	-Aad, Brand beliefs, Abr -positive and negative feelings can co-occur -adding feelings scales improved models for explaining Aad and Abr -feelings matter for both informational and transformational ads
<i>Allen, Machleit, and Marine, 1988</i> Verbal: Typology based on Izard's DES-scale (1977)	-emotions evoked by advertising were rated on DESII (adjectives) and DESIII (phrases) in 2 conditions: with or without viewing a tape with	No other variables -ER is multidimensional and can be captured by the primary emotions derived from Izard.

- Commercials	commercials	-emotions joy, interest, surprise and disgust are most commonly associated with advertising.
<i>Olney, Holbrook, and Batra, 1991</i> Verbal: PAD dimensions (Mehrabian and Russell 1974) - Commercials	-an independent group of judges rate the ads on PAD dimensions	-viewing time -effects of ad content on viewing time are partially mediated by ER and Aad -Two hierarchical routes to viewing time: pleasure-hedonism and arousal-interest
<i>Stout and Leckenby, 1988</i> Typology - Commercials	-three progressively involved levels of emotional response: experiential, empathic, and descriptive -measured by an open-ended question, content coded	-Aad, Abr, Ad Recall, Brand Recall, PI -reanalysis of the data of 1986 more significant results -ER compared to no ER led to increased Aad, Abr, PI and ad recall, no difference in Brand Recall
<i>Mano, 1996</i> Verbal: Own Typology Dimensional approach - Commercials	-subjects rated commercials on 8 dimensions, yes/no answers -each dimension was represented by 3-4 items -later FA for validating the 8 dimensions plotted on a circumplex	-ad familiarity -all 8 dimensions occur as ERs to ads and can be structured in a circumplex -Pleasantness reactions occurred most frequently in ads -Ad familiarity leads to more Pleasantness and less Boredom
<i>Pieters and de Klerk-Warmerdam, 1996</i> Verbal: Own Typology and Dimensional approach - Print ads	-judges grouped 50 potential ad-evoked feelings according to perceived similarity -after individual difference scaling this lead to 3 dimensions: pleasantness, intensity and direction -18 feelings were selected for the final scale	-Aad, Brand Recall -Aad driven by pleasantness -Recall driven by intensity -pleasantness and intensity are unrelated -consistent with mainstream emotion research (PAD dimensions)
Visual Self Report		
Study	Method	Other variables Major Findings
<i>Morris and McMullen, 1994</i>	-TV commercials were halved	No other variables

Visual: SAM (for continuous measurement) -Commercials	and SAM was measured at the 1 st half alone, at the 2 nd half alone, after the whole ad or at after each half	-ER to the first half was most important in determining emotional responses to the ad as a whole -correlations with the whole ad greater for pleasure than for arousal -reactions to the two halves differed
<i>Morris, 1995</i> Visual: SAM - Print ads	-ads are scored on SAM -135 emotion words were scored on SAM -both the ads and the emotion words are plotted in a 2D pleasure-arousal space	No other variables -description of the visual SAM-measure -the connection of SAM scores to verbalized emotions can be further applied in qualitative research -SAM can be applied to a wide range of marketing communication stimuli
<i>Morris et al., 2002</i> Visual: AdSAM - Commercials, radio and print ads	-SAM was measured to a large set of commercials, radio and print ads	-Aad, Brand interest, behavioral intention (PI or Store Visit) -both ER and Aad were related to behavioral intentions but ER had more explanatory power -Abr is not necessarily a precursor to intention
<i>Ketelaar and Van Gisbergen, 2004</i> Visual: PrEmo -Print ads	-PrEmo was used to measure ER to open and closed ads	No other variables -PrEmo is a valid measure for measuring ER to advertising -Closed ads evokes more positive ER and open ads evoked more negative ER
Moment-to-Moment Measures		
Study	Method	Other variables Major Findings
<i>Aaker, Stayman, and Hagerty, 1986</i> Warmth monitor -Commercials	-warmth reactions to commercials were measured using the warmth monitor -arousal reactions were	-Aad, Ad Recall, PI -warmth was accompanied by arousal

	measured by means of skin response	-sequence effects: a warm ad preceded by another warm ad was less effective than a warm ad preceded by a non-warm ad -warmth is related to Aad and PI -no relation between warmth and Ad Recall
<i>Vanden Abeele and Maclachlan, 1994</i> Warmth monitor -Commercials	-emotional reactions to commercials were measured in three conditions: 1. warmth monitor 2. skin conductance (SC) 3. both	No other variables -the warmth monitor a reliable measure of warmth -warmth is weakly related to SC and only when measured simultaneously -The warmth monitor lacks discriminant validity (compared to Plutchik's emotions)
<i>Baumgartner, Sujan, and Padgett, 1997</i> Feelings monitor - Commercials	-continuous overall positive or negative ER were measured by the feelings monitor	-Aad, Abr, brand recall -Aad was positively related to high positive peaks in ER, and to an increase in ER over time - Although weaker, Abr and Brand Recall exhibited similar effects
<i>Rossiter and Thornton, 2004</i> Fear-Relief measurement - Commercials	-continuous fear-relief reactions were measured and compared to static post exposure measures	-Ad evaluation, behavioral measure -the continuous measure is more sensitive in capturing fear-relief patterns -Emotional shift (fear-relief) has more impact on attitudes and behavior than single, static emotions (fear alone)
2. AUTONOMIC MEASURES		
Heart Rate		
Study	Method	Other variables Major Findings
<i>Lang, 1990</i> Heart rate - Commercials	-Tonic changes in HR were measured to assess arousal reactions to a set of	No other variables -HR can serve as a real-time

	commercials (compared to phasic changes to assess attention)	measure of attention and arousal -emotional content increases physiological arousal -the intensity of attention can be affected by arousal
Skin Conductance		
Study	Method	Other variables Major Findings
<i>LaBarbera and Tucciarone, 1995</i> Skin conductance - Commercials and print ads	-Various (practitioner) studies in which galvanic skin response is measured as an indicator of the motivational power of advertising stimuli	-Market performance -Often discrepancy between self-report and SC -SC seems to be a better predictor of market performance - SC is a valid diagnostic tool for continuous measurement - Guidelines are formulated for the appropriate implementation of SC measurement
Facial Expression		
Study	Method	Other variables Major Findings
<i>Derbaix, 1995</i> Facial coding (vs verbal self report) -Commercials	-trained coders coded the faces of the respondents on three facial areas: brows/forehead, eyes/lids and mouth/chin -this was repeated in three 10 second intervals	-Aad, Abr, brand familiarity -verbal ERs have an impact on Aad and Abr, coding of facial expression have not -Attitude towards unfamiliar brands is more influenced by ERs than attitude towards familiar brands.
<i>Hazlett and Hazlett, 1999</i> Facial expression (vs verbal self report) -Commercials	-Facial EMG activity was recorded and compared to self-report pleasure and arousal measures	-brand recall, persuasion -Facial EMG more sensitive discriminator and more strongly related to brand recall than self report -Significant elevations in continuous Facial EMG measures were related to specific emotion-congruent events in the

		commercial
<i>Bolls, Lang, and Potter, 2001</i> Facial expression, heart rate, skin conductance -Radio commercials	-Facial EMG activity was recorded -HR and SC as measures of arousal	-Aad, brand recall, brand recognition -facial EMG is a valid way to measure valence of emotional response -Arousal (HR, SC) is a better predictor of brand recall than valence (facial EMG)

4. NEW DIRECTIONS IN EMOTION MEASUREMENT: *NEUROSCIENCE AND BRAIN IMAGING*

In the introduction we mentioned the recent contributions from the field of neuroscience in studying the role of emotions in human behavior and decision making. Several advertising researchers have already highlighted the importance of keeping in touch with the latest developments in neuroscience (Du Plessis, 2005; Hall, 2002; Vakratsas and Ambler, 1999). Nevertheless, to date, direct testing of hypotheses based on neuroscience has been limited.

Ambler and Burne (1999) studied the relation between emotional reactions and memory for TV commercials. Emotional reactions were measured by verbal self report. Inspired by neuroscience research, an experimental group was treated with β -blockers (a chemical substance that inhibits the experience of emotions but not the recognition of emotions) and a control group with a placebo. Their results show that ads with higher affective components (compared to cognitive components) yielded better recall and recognition. Further, treatment with β -blockers reduced the difference in recall (not in recognition!) for ads with affective versus cognitive components. Ambler and Burne (1999) conclude that their results are consistent with neuroscience literature which states that emotional reactions are related to long term memory.

The ultimate way of studying the role of emotions in advertising, is by directly looking into the brain. In earlier advertising research, various brain imaging techniques have already been applied (Rotschild et al., 1986; Rotschild et al., 1988; Rotschild and Hyun, 1990; Rossiter et al., 2001). However, these studies only studied memory processes in the brain. They did not focus on what happens in the brain regions responsible for emotional reactions.

Ioannides et al. (2000) were the first to apply the brain imaging technique MEG (magnetoencephalography) to observe differences in brain activation during exposure to affective and cognitive advertising stimuli. Despite the very preliminary nature of this experiment (only three subjects were involved), significant differences in brain activation between affective and cognitive ad segments were identified in all three subjects.

To date, the use of brain imaging techniques in advertising is limited. For a clear technical introduction on the relevance of brain imaging techniques for advertising research, we refer to Plassman, Kenning, and Ahlert (2005). However, these techniques are very promising and possess the ability to shed a new exciting light on how advertising works. We call for studies that apply modern brain imaging techniques like MEG or fMRI to study emotional reactions evoked by advertising.

5. EMOTION MEASURES AND ADVERTISING EFFECTIVENESS

Traditional measures of advertising effectiveness include attitude towards the advertisement (Aad), brand attitude (Abr), purchase intention (PI), memory (ad recall, brand recall and recognition), and market performance. Over the years, there has been considerable debate about how these measures of advertising effectiveness need to be structured and how they influence each other (Biehal, Stephens, and Curlo, 1992; Brown and Stayman, 1992; Machleit and Wilson, 1988; MacKenzie, Lutz, and Belch, 1986). In this article we do not aim at solving this debate. However, by reviewing the different emotion measures, we – inevitably

- encountered investigations concerning the relationship between emotional reactions and other measures of advertising effectiveness. In the following paragraphs, we briefly summarize how emotional reactions relate to traditional determinants of advertising effectiveness (Aad, Abr, PI, recall).

IMPACT OF EMOTIONAL REACTIONS ON OTHER MEASURES OF ADVERTISING EFFECTIVENESS

Attitude towards the Ad (Aad). Emotional reactions have a direct effect on Aad. This was found for both verbal (Batra and Ray, 1986; Holbrook and Batra, 1987; Edell and Burke, 1987) and visual measures (Morris et al., 2002). Pleasure reactions had more impact on Aad than arousal reactions (Olney, Holbrook, and Batra, 1991; Pieters and de Klerk-Warmerdam, 1996). Most studies using autonomic measures did not include a measurement of Aad.

Derbaix (1995) found a strong relation between emotional reactions and Aad for verbal measures but no relation between emotional reactions and Aad for the measures obtained by the (insensitive) coding of facial expressions by means of FACS. According to Derbaix (1995), this close relation between emotional reactions and Aad found in verbal self report studies is obvious because both measurements tap into the same underlying construct of cognitive and retrospective response.

Attitude towards the Brand (Abr). Authors applying verbal self report generally found that emotional reactions have an indirect impact on Abr (Batra and Ray, 1986; Edell and Burke, 1987) or that emotional reactions taken together with Aad determine Abr (Holbrook and Batra, 1987). However, the visual self report study of Morris et al. (2002) reported a direct impact of emotional reactions on Abr.

Purchase Intention (PI). Batra and Ray (1986) found an indirect impact of emotional reactions measured by verbal self report on PI. A positive relation between emotional

reactions and PI was found when applying the warmth monitor (Aaker, Stayman, and Hagerty, 1986). Morris et al. (2002) found a direct impact from emotional reactions on PI and, furthermore, this relation was stronger than the impact of cognitive factors (like beliefs and knowledge) on PI. Again, PI was not explicitly tested in studies using autonomic measures. Nevertheless, based on experience from real market results, LaBarbera and Tucciarone (1995) argued that SC measures are more strongly related to actual market performance compared to verbal self report.

Recall. For verbal self report (Pieters and de Klerk-Warmerdam, 1996), magnitude scaling (Aaker, Stayman, and Hagerty, 1986) and autonomic measures (Bolls, Lang, and Potter, 2001) the consistent finding was that arousal is a better predictor of recall compared to valence.

Ad and Brand familiarity. Although not a real measure of advertising effectiveness, ad or brand familiarity can be an important moderator when studying the role of emotional reactions in the advertising process. Although Pieters, Rosbergen, and Wedel (1999) found attention to ads to decrease with repeated exposures, Mano (1996) found that previously seen ads lead to more pleasantness and less boredom compared to first-seen ads. This could indicate that emotional reactions are positively related to ad familiarity.

The inverse was found for brand familiarity, however. It was found that the effect of emotional reactions and Aad on Abr is stronger for unfamiliar versus familiar brands (Derbaix, 1995). These findings are consistent with the results of Machleit and Wilson (1988) and Machleit, Allen, and Madden (1993) who reported that the Abr for familiar brands is already constituted in consumers' minds and is therefore not so strongly affected by Aad anymore.

6. LIMITATIONS OF THE STUDIES SO FAR

A first limitation is that most papers discussed here focus on the measurement of single emotions. This means, they only measure one type of emotion at one given moment in the advertising process (e.g. measuring one-shot pleasure and arousal reactions after viewing a print ad) or they measure one single emotion in a continuous manner (e.g. measuring the level of warmth while viewing a TV commercial). However, as articulated in the “emotion-shift theory”, behavior generated by advertising is often driven by the shift evoked from one emotion to another, e.g. fear → relief, bored → excited (Rossiter and Bellman, 2005; Rossiter and Percy, 1991, 1997).

Several papers do provide support for the emotion-shift hypothesis. For example, the studies by Rossiter and Thornton (2004) and Baumgartner, Sujan, and Padgett (1997) show commercials to be most effective when emotional reactions shift from negative to positive during the viewing process.

The measurement of emotion-shift, however, seems less feasible for print ads. Kamp and MacInnis (1995) found that the “emotional flow” in print ads generated increased likeability. In other words, print ads in which the emotion expressed by the main character shifted from negative to positive in the ad were liked more than ads with static characters. The question remains whether the change in emotions expressed by the main character is transferred to the viewer, thus, evoking an emotion-shift. It is a challenge for future research to try to capture the emotion-shift in print ads.

A second limitation is that most studies reported here are conducted in unnatural lab settings. Moreover, a substantial part of the studies involve a pre-testing context of advertising stimuli. This means that respondents were ‘forced’ to look and think about the stimuli that were shown. As already outlined by Derbaix (1995), emotional reactions and their relation to other measures of advertising effectiveness, as discussed above, may be substantially stronger

in real life when individuals are less motivated for conscious and elaborate processing of ads and brands.

SUMMARY AND CONCLUSIONS

In this article we have evaluated and compared two main methods for measuring emotional reactions to advertising stimuli: self report measures and autonomic measures. These measures fundamentally differ in the aspect of emotions they register. This largely determines their strengths and weaknesses (for a summary see Table 2). Self report measures are cheap and easy but they necessarily involve a cognitive intervention. Autonomic reactions, at first sight, seem most valid to measure lower-order emotions. However, due to implementation difficulties and the lack of straightforward and accurate data, the measurement of autonomic measures is not yet fully integrated in advertising research.

Table 2. Summary of the Different Emotion Measurement Methods

	SELF REPORT MEASURES			AUTONOMIC MEASURES		
	Verbal	Visual	Moment-to-moment	Facial EMG	Skin conductance	Heart rate
Cognitive bias: Yes (Y) or No (N)	Y	Y	Y	N	N	N
Pleasure (P) or arousal (A)	P/A	P/A	P/A	P	A	P/A
One (O) or multiple emotions (M)	M	M	O	O	O	O
Continuous (C) or Static (S)	S	S	C	C	C	C
Individual (I) or group assessment	G	G	I	I	I	I

(G)						
Cheap (C) or expensive (E)	C	C	C	E	E	E
Noise	N	N	N	Y	Y	Y

Comparing the effect of emotional reactions on other measures of advertising effectiveness reveals some general effects for all types of measurement. Results from different methods seem to indicate that the arousal has more effect on recall as compared to valence. When it comes to the effects on Abr and PI, we can conclude that visual self report measures and autonomic measures yielded more direct effects compared to verbal self report, in which the effect of emotional reactions on Abr and PI is often mediated by Aad. We think this is mainly due to the fact that studies reporting verbal self report of emotional reactions often include a similar verbal measure of Aad making Aad a confounding variable instead of a variable that provides additional information. Consequently, in verbal self report, Aad mediates all other effects of emotional reactions. Similar concerns are also expressed by Derbaix (1995) and Morris et al. (2002). This constraint mainly applies to the verbal measurement of lower-order pleasure emotions.

The abundance of studies supporting the direct or indirect impact of emotional reactions on other measures of advertising effectiveness proves that emotions fulfill a crucial role in the advertising process. Recent research on emotions from the field of neuroscience has indicated that emotions come first and form the basis of rational thinking and behavior. Applying this to advertising, we suggest that an emotional reaction needs to be established before further cognitive processing of an advertising stimulus takes place. Emotions can be considered as the gatekeeper for further ad processing. Several studies we reviewed here support this

notion. The paper by Morris et al. (2002) convincingly showed that emotional reactions to ads dominated cognitive factors in explaining behavior, e.g. purchase intention.

RECOMMENDATIONS FOR THE PRACTICAL USE OF THE MEASUREMENT METHODS

The recommendations we formulate are dependent on the type of ad (print ad or commercial) and on the type of emotion (lower vs. higher-order emotion) involved.

Print ads. For the measurement of lower-order emotional reactions to print ads, autonomic measures are - theoretically – the most valid since they are not distorted by cognitive processes. However, in current advertising research, the use of these types of measures has been scarce. This implies that to date we can not conclude much about their predictive validity. That is why, from a practical point of view, we recommend visual self report measures like SAM. These methods can perform quick and cheap measurements of emotional reactions. Moreover, these measures are suitable for large scale research, cross cultural research and research with children. Although they can only administer subjective feelings, the cognitive bias is lower compared to verbal self report. Moreover, previous research has shown that emotional reactions measured by means of SAM exhibit direct effects on behavioral measures like purchase intention (Morris et al., 2002).

Verbal self report can be suited for the measurement of higher-order emotions related to print ads. Some ads are explicitly designed to evoke discrete emotions, for example, hope, or guilt appeals. Since higher-order emotions typically involve more cognitive processing, verbal self report can be suitable for the measurement of these emotions. Alternatively, the visual measurement instrument PrEmo also captures specific emotions. However, the typical specific emotions evoked by advertising (e.g., hope, relief, guilt) are not explicitly included in this measurement scale.

Commercials. For the measurement of lower-order emotional reactions to commercials, autonomic measures do also - theoretically - provide the most valid measurement. However, keeping in mind the high skills required to implement such research and the little we know about their external validity, these methods first require further exploration. For practical reasons, moment-to-moment measurement techniques may a more feasible instrument to register continuous lower-order emotions. In this way, continuous emotion measures of valence or arousal can be administered quick and easy.

We also recommend moment-to-moment measures to register continuous higher-order emotions evoked by commercials. Rossiter and Thornton (2004) showed that capturing a continuous fear-relief measure by means of magnitude scaling was more sensitive in predicting behavior compared to static post hoc measures of fear.

FUTURE RESEARCH RECOMMENDATIONS

This review reveals how much is still unknown about the predictive validity of the different measurement methods, especially the autonomic measures. We call for studies that investigate how the measurement types relate to external measures like purchase intention or brand choice behavior.

Further, it is also essential that advertising researchers stay in touch with developments in emotion research from rapidly developing fields like neuroscience. It is important that they take the challenge of applying these new insights into advertising research. In this context, the potential of brain imaging techniques also needs to be further explored.

There is still a long way to go before all emotion issues will be unraveled. We argue for a mutual cooperation between academics and practitioners in the sense that practitioners deliver ads which then can be (pre)tested using different emotion measurement instruments. In that way, the predictive power of emotional reactions for behavioral measures like purchase

intention, brand choice, and actual purchase, can be accurately assessed in well designed research experiments. Only extensive and meticulous research, testing real ads in clean experimental designs, will resolve the issues concerning the predictive validity of the different research methods and will, ultimately, reveal the genuine role emotions play in the advertising process.

REFERENCES

- Allen, C.T., K.A. Machleit, and S.S. Marine. "On assessing the emotionality of advertising via Izard's Differential Emotion Scale." *Advances in Consumer Research* 15 (1988): 226-231.
- Aaker, D.A, D.M. Stayman, and M.R. Hagerty. "Warmth in advertising: measurement, impact, and sequence effects." *Journal of Consumer Research* 12 (1986): 365-381.
- Ambler, T., and T. Burne. "The impact of affect on memory of advertising." *Journal of Advertising Research* 39 (1999): 25-34.
- Bagozzi, R.P. "The role of psychophysiology in consumer research." In: Robertson, T.S., and H.H. Kassarian (Eds.). *Handbook of consumer behavior*. New Jersey: Prentice-Hall, 1991.
- Bagozzi, R.P, M. Gopinath, and P.U. Nyer. "The role of emotions in marketing." *Journal of the Academy of Marketing Science* 27 (1999): 184-206.
- Bargh, J.A., and T.L. Chartrand. "The unbearable automaticity of being." *American Psychologist* 54(7) (1999): 462-479.
- Batra, R., and M.L. Ray. "Affective responses mediating acceptance of advertising." *Journal of Consumer Research* 13 (1986): 234-249.
- Baumgartner, H., M. Sujan, and D. Padgett. "Patterns of affective reactions to advertisements: the integration of moment-to-moment responses into overall judgments." *Journal of Marketing Research* 19 (1997): 219-232.
- Ben-Shakhar, G. "Standardization within individuals: A simple method to neutralize individual differences in psychophysiological responsivity," *Psychophysiology* 22 (1985): 292-299.

- Biehal, G., D., Stephens, and E. Curlo. "Attitude toward the ad and brand choice." *Journal of Advertising* 21(3) (1992): 19-36.
- Bolls, P.D., A. Lang, and R.F. Potter. "The effect of message valence and listener arousal on attention, memory, and facial muscular responses to radio advertisements." *Communication Research* 28(5) (2001): 627-651.
- Brown, S. P., and D. M. Stayman. "Antecedents and Consequences of Attitude toward the Ad: A Meta-analysis." *Journal of Consumer Research* 19(1) (1992): 34-51.
- Brunel, F.F., B.C. Tietje, and A.G. Greenwald. "Is the implicit association test a valid and valuable measure of implicit consumer social cognition?" *Journal of Consumer Psychology* 14 (2004): 385-404.
- Burke, M.C and J.A. Edell. "The impact of feelings on Ad-based affect and cognition." *Journal of Marketing Research* 16 (1989): 69-83.
- Cacioppo, J.T., M.L.Losch, L.G.Tassinary, and R.E. Petty. "Properties of affect and affect laden information processing as viewed through the facial response system." In: Peterson, R.A., W.D. Hoyer, and W.R. Wilson (Eds.). "The role of affect in consumer behavior; emerging theories and applications (pp. 87-118)." Lexington, MA: D.C. Heath, 1986.
- Chartrand, T.L. "The role of conscious awareness in consumer behavior." *Journal of Consumer Psychology* 15(3) (2005): 203-210.
- Cuthbert, B.N, M.M. Bradley, and P.J. Lang. "Probing picture perception: activation and emotion." *Psychophysiology* 33 (1996): 103-111.
- Damasio, A. "*Descartes' Error: Emotion, reason and the human brain.*" New York: Grosset/Putnam, 1994

Darwin, C. *"The expression of emotion in man and animals."* London: John Murray, 1872.

Dawson, M.E., A.M. Schell, and D.L. Filion. "The electrodermal system." In: Cacioppo, J.T., L.G. Tassinary, and D.L. Filion (Eds.). *"Handbook of psychophysiology."* Cambridge: University Press, 2000.

Derbaix, C.M. "The impact of affective reactions on attitudes towards advertisements and the brand: a step towards ecological validity." *Journal of Marketing Research* 17 (1995): 470-479.

Desmet, P. *"Designing emotions."* Delft: Technische Universiteit, 2002.

Desmet, P.M.A., P. Hekkert, and J.J. Jacobs. "When a car makes you smile: Development and application of an instrument to measure product emotions." In: Hoch, S.J. and R.J. Meyer (Eds.). *Advances in Consumer Research* 27 (2000): 111-117.

Du Plessis, E. *The advertised mind.* London: MillwardBrown, 2005.

Edell, J.A., and M.C. Burke. "The power of feelings in understanding advertising effects." *Journal of Consumer Research* 14 (1987): 421-433.

Ekman, P., and W. V. Friesen. *Unmasking the Face.* Englewood Cliffs, NJ: Prentice Hall, 1975.

Ekman, P., and W. V. Friesen. *Facial Action Coding System.* Palo Alto, CA: Consulting Psychologists Press, 1978.

Ekman, P. "An argument for basic emotions." *Cognition and Emotion* 6 (3/4) (1992): 169-200.

Frijda, N.H., P. Kuipers, and E. ter Schure. "Relations among Emotion, Appraisal, and Emotional Action Readiness." *Journal of Personality and Social Psychology* 57 (2) (1989), 212-228.

Greenwald, M.K., E.W. Cook, and P.J. Lang. "Affective judgment and psychophysiological response: dimensional covariation in the evaluation of pictorial stimuli." *Journal of Psychophysiology* 3 (1989): 51-64.

Hall, B.F. "A New Model for Measuring Advertising Effectiveness." *Journal of Advertising Research* 42 (March-April) (2002): 23-31.

Hazlett, R.L., and S.Y. Hazzlet. "Emotional response to television commercials: facial EMG vs. self-report." *Journal of Advertising Research* 39 (1999): 7-23.

Havlena, W.J., and M.B. Holbrook. "The varieties of consumption experience: comparing two typologies of emotion in consumer behavior." *Journal of Consumer Research* 13 (1986): 394-404.

Heath, R.G., and A. Nairn. "Measuring Affective Advertising - implications of low attention processing on recall." *Journal of Advertising Research* 45 (in press).

Holbrook, M.B., and R. Batra. "Assessing the role of emotions as mediators of consumer responses to advertising." *Journal of Consumer Research* 14 (1987): 404-420.

Hopkins, R., and J.E. Fletcher. "Electrodermal measurement: particularly effective for forecasting message influence on sales appeal." In: Lang, A. (Ed.) *Measuring psychological responses to media*. New Jersey: Lawrence Erlbaum, 1994.

Ioannides, A.A., et al. "Real time processing of affective and cognitive stimuli in the human brain extracted from MEG signals." *Brian Topography* 13 (2000): 11-19.

Izard, C.E. *Human Emotions*. New York: Plenum, 1977.

Kamp, E., and D.J. MacInnis. "Characteristics of Portrayed Emotions in Commercials: When does what is shown in ads affect viewers?" *Journal of Advertising Research* (November/December) (1995): 19-28.

Ketelaar, P., and M. Van Gisbergen. "(Pr)Emotie bij advertenties. Een onderzoek naar het meten van emoties bij advertenties met het Product Emotion Measurement Instrument (PrEmo)." Working paper. Nijmegen: Radboud Universiteit, 2004.

King, M.F., and G.C. Bruner. "Social desirability bias: A neglected aspect of validity testing." *Psychology & Marketing* 17 (2000): 79-103.

Kozmar, D., K.Catipovic-Veselica, A.Galic, and J. Habek."Depression in acute coronary syndrome." *Psychological Reports* 93 (3) (2003): 1105-1108.

LaBarbera, P.A., and J.D. Tucciarone. "GRS reconsidered: a behavior-based approach to evaluating and improving the sales potency of advertising." *Journal of Advertising Research* 35 (1995): 33-53.

Lang, A. "Involuntary attention and psychophysiological arousal evoked by structural features and mild emotion in TV commercials." *Communication Research* 17 (3) (1990): 275-299.

Lang, A. "What can the heart tell us about thinking?" In: Lang, A. (Ed.). *Measuring psychological responses to media*. New Jersey: Lawrence Erlbaum, 1994.

Lang, A., M.K. Greenwald, M.M. Bradley, and A.O. Hamm. "Looking at pictures: affective, facial, visceral, and behavioural reactions." *Psychophysiology* 30 (3) (1993): 261-273.

Lang, P.J. "Behavioral treatment and bio-behavioral assessment: Computer applications." In: Sidowski, J.B., J.H. Johnson, and T.A. Williams (Eds.). *Technology in mental health care delivery systems* (pp. 119-137). Norwood, NJ: Ablex Publishing, 1980.

Lazarus, R.S. *Emotion and Adaptation*. New York: Oxford University Press, 1991

LeDoux, J.E. *The Emotional Brain: The mysterious underpinnings of emotional life*. New York: Phoenix, 1996

Machleit, K.A., C.T. Allen, and T.J. Madden. "The Mature Brand and Brand Interest: An Alternative Consequence of Ad-Evoked Affect." *Journal of Marketing* 57 (October) 1993: 72-82.

Machleit, K.A., and R.D. Wilson. "Emotional Feelings and Attitude toward the Advertisement: The Roles of Brand Familiarity and Repetition." *Journal of Advertising* 17 3 (1988): 27-35.

MacKenzie, S. B., R. J Lutz, and G. E Belch. "The Role of Attitude toward the Ad as a Mediator of Advertising Effectiveness: A Test of Competing Explanations." *Journal of Marketing Research* 23 (2) (1986): 130-143.

Mano, H. "Assessing emotional reactions to TV ads: a replication and extension with a brief adjective checklist." *Advances in Consumer Research* 23 (1996): 63-69.

Mehrabian, A., and J.A. Russell. *An approach to environmental psychology*. Cambridge, MA: The MIT Press, 1974.

Morris, J. D. "Observations: SAM: The self-assessment manikin." *Journal of Advertising Research* 35 (1995): 63-68.

Morris, J.D., and M. Boone. "The effects of music on emotional response, brand attitude, and purchase intent in an emotional advertising condition." *Advances in Consumer Research* 25 (1998): 518-526.

Morris, J.D., and J.S. McMullen. "Measuring multiple emotional responses to a single commercial." *Advances in Consumer Research* 21 (1994): 175-180.

- Morris, J.D., C. Woo, J.A. Geason, and J. Kim. "The power of affect: Predicting intention." *Journal of Advertising Research* 42 (2002): 7-17.
- Olney, T.J, M.B. Holbrook, and R. Batra. "Consumer responses to advertising: the effects of ad content, emotions, and attitude towards the ad on viewing time." *Journal of Consumer Research* 17 (1991): 440-453.
- Plassman, H., P. Kenning, and D. Ahlert. "A window to the consumers mind: application of functional brain imaging techniques to advertising research." In Diehl, S., R. Terlutter, and P. Weinberg (Eds). *Proceedings of the 4th International Conference on Research in Advertising (ICORIA)*, Saarbruecken (pp. 74-81), 2005.
- Plutchik, R. *Emotion – a psychoevolutionary synthesis*. New York: Harper and Row, 1980.
- Pieters, R.G.M., and M. de Klerk-Warmerdam. "Ad-evoked feelings: structure and impact on Aad and recall." *Journal of Business Research* 37 (1996): 105-114.
- Pieters, F.G.M., E. Rosbergen, and M. Wedel. "Visual attention to repeated print advertising: A test of scanpath theory." *Journal of Marketing Research* 36 4 (1999): 424-438.
- Ravaja, N. "Contributions of psychophysiology to media research: Review and recommendations." *Media Psychology* 6 (2) (2004): 193-235.
- Rossiter, J.R., and S. Bellman. *Marketing Communications: theory and applications*. Frenchs Forest: Pearson Prentice Hall, 2005.
- Rossiter, J.R., and L. Percy. "Emotions and motivations in advertising." *Advances in Consumer Research*, 18 (1991): 100-110.
- Rossiter, J.R., and L. Percy. *Advertising communication and promotion management*. New York: McGraw-Hill, 1997.

- Rossiter, J.R., R.B., Silberstein, P.G Harris, and G. Nield. "Brain-Imaging detection of visual scene encoding in long term memory for TV commercials." *Journal of Advertising Research* 41 (2001): 13-21.
- Rossiter, J.R., and J. Thornton. "Fear-pattern analysis supports the fear-drive model of antispeeding road-safety TV ads." *Psychology & Marketing* 21 (11) (2004): 945-960.
- Rothschild, M.L. et al. "EEG activity and the processing of television commercials." *Communication Research* 13 (2) (1986): 182-220.
- Rothschild, M.L., et al. "Hemispherically lateralized EEG as a response to television commercials." *Journal of Consumer Research* 15 (1988): 185-198.
- Rothschild, M.L., and Y.J. Hyun. "Predicting memory for components of TV commercials from EEG." *Journal of Consumer Research* 16 (1990): 472-478.
- Russell, J. A. "A circumplex model of affect." *Journal of Personality and Social Psychology* 39 (1980): 1161-1178.
- Russell, J.A., and L.F. Barrett. "Core affect, prototypical emotional episodes, and other things called Emotion: Dissecting the elephant." *Journal of Personality and Social Psychology* 76 (5) (1999): 805-819.
- Russell, J.A., and A. Mehrabian. "Evidence for a three-factor theory of emotions." *Journal of Research in Personality* 11 (3) (1977): 273-294.
- Shiv, B., and A. Fedorikhin. "Heart and Mind in Conflict: Interplay of Affect and Cognition in Consumer Decision Making." *Journal of Consumer Research* 26 (December) (1999): 278-282.
- Sinha, R., and O.A. Parsons. "Multivariate response patterning of fear and anger." *Cognition and Emotion* 10 (1996): 173-198.

Smith, C.A., and P.C. Ellsworth. "Patterns of Cognitive Appraisal in Emotion." *Journal of Personality and Social Psychology* 48 (4) (1985): 813-838.

Stout, P.A., and J.D. Leckenby. "Measuring emotional response to advertising." *Journal of Advertising* 15 (4) (1986): 35-42.

Stout, P.A., and J.D. Leckenby. "The nature of emotional response to advertising: a further investigation." *Journal of Advertising* 17 (4) (1988): 53-57.

Susman, E.J. et al. "The effect of sex hormone replacement therapy on behavior problems and moods in adolescents with delayed puberty." *Journal of Pediatrics* 133 (4) (1998): 521-525.

Vakratsas, D., and T. Ambler. "How Advertising Works: What Do We Really Know?" *Journal of Marketing* 63 (January) (1999): 26-43.

Van Raaij, F. "How consumers react to advertising." *International Journal of Advertising* 8 (1989): 261-273.

Vanden Abeele, P., and D.L. MacLachlan. "Process tracing of emotional responses to TV ads: revisiting the warmth monitor." *Journal of Consumer Research* 20 (1994): 586-600.

Wiles, J.A. and T. B. Cornwell. "A Review of Methods Utilized in Measuring Affect, Feelings, and Emotion in Advertising." *Current Issues and Research in Advertising* 13 (2) (1990): 241-275.

Winkielman P., G. G. Berntson, and J. T. Cacioppo. "The psychophysiological perspective on the social mind." In Tesser A., and N. Schwarz (Eds.). *Blackwell Handbook of Social Psychology: Intraindividual Processes*. (pp. 89-108). Oxford: Blackwell, 2001.

Winkielman, P., K.C. Berridge, and J.L. Wilbarger. "Unconscious affective reactions to masked happy versus angry faces influence consumption behavior and judgments of value." *Personality and Social Psychology Bulletin* 31 (1) (2005): 121-135.

Zajonc, R.B. "Feeling and thinking: preferences need no inferences." *American Psychologist* 35 (1980): 151-175.

Zaltmann, G. *How customers think*. Boston, MA: Harvard Business school press, 2003.

Zeitlin, G.M., and R.A. Westwood. "Measuring emotional response." *Journal of Advertising Research* 26 (1986): 34-44.