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Measuring Emotions in a Consumer decision-making
Context – Approaching or Avoiding

By

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Abstract:

The purpose of this paper is to identify suitable methods for measuring future-oriented emotions in a consumer context, where they have been shown to play an important role in decision-making. However the experience and knowledge of future-oriented emotions in consumer research is limited and it is thus necessary to broaden the perspective to cover emotions in general to gain insight into the possible methods.

This paper examines the methods for measuring emotions in a consumer context. Emotions have recently gained increasing attention but the measurement of emotions is complex and the experience is limited. However several methods have been applied over time and a review of these methods and the experiences gained can build a foundation for further research in the area of future-oriented emotions in consumer decision-making.

Three overall approaches to the measurement of emotions in consumer research are found: Self report, autonomic measures and brain imaging. Verbal Self Report and fMRI are assessed to be the most important methods. Self report is the most commonly used technique to measure emotions especially in consumer research and this is primarily verbal self report. However the method is found to have severe limitations. Brain imaging and especially fMRI has contributed significantly to the progress in cognitive neuroscience and the technique has also entered consumer research in form of neuroeconomics or consumer neuroscience often focusing on emotional aspects and decision making. fMRI is found to offer intriguing new possibilities for insight. However the method is extremely expensive and requires special equipment and expert knowledge that are not usually found in consumer research.

Although problematic and challenging it is found that further work on the measurement of emotions in general and future-oriented emotions in specific are important to consumer research.

Keywords: Measuring emotions, consumer research, consumer decision-making, self report, autonomic measures, brain imaging

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Emotion and feelings have gotten increasing attention in various disciplines in recent years. The technological development has opened for new techniques to search knowledge, and the role played by emotions and feelings in human behavior has become much clearer, although much is still unknown.

From an evolutionary perspective emotions are linked to survival mechanisms. They guide approach and avoidance behavior in humans. Emotions play an important role in our everyday life and the way we make decisions.

Emotions and feelings have long been recognized as important factors in consumption and consumer decision making. The understanding of emotions and the measurement of emotions in consumer research has throughout time depended largely on contributions from more grounded disciplines e.g. psychology and sociology, and the increased focus on emotions in other disciplines has given ground for increasing attention in consumer research. The recognition of the importance of emotion in decision-making, not least due to findings in cognitive neuroscience, has escalated the attention.

Although several studies have been made in consumer research that includes measuring of emotions this is still linked to severe problems and the focus on emotions in scholarly contributions have been limited considering the role emotions play in all aspects of life and thus also in consumer behavior. Measuring emotions is not a simple task and calls for careful reflections. The fact that emotions are often unconscious makes the measurement extremely complex. Besides this rather important challenge; the definition and conceptualization of emotions has not been completely clear, e.g. in the case of future oriented emotions (Baumgartner, Pieters and Bagozzi, 2008), which is extremely important for decision-making (Loewenstein and Lerner, 2003)

The purpose of this paper is to take a closer look at what possible techniques exist to measure emotions and how suitable they are for measuring emotions in general and when possible if they have been used to measure future-oriented emotions. Future-oriented emotions have gotten little attention in consumer research although they play an important motivating role in consumer behavior (Baumgartner, Pieters and Bagozzi, 2008). In order to look further into the measurement of future-oriented emotions it is important to explore the measurement of emotions in general, since

the experience with measuring future oriented-emotions is limited. The paper will thus take a wider look at techniques and experiences with measurement of emotions in general in consumer research as well as measurement of future-oriented emotions.

Emotions in consumer research

Emotions in different forms have been present in hierarchy-of-effect models like AIDA and in advertising literature since 1925 (Strong, 1925). In this type of models affect occurs after processing. This notion was changed after Zajonc (1980) argued that emotions happens prior to cognition and that emotions can function independently of cognition giving rise to two different streams of emotion literature in consumer research. One stream follows Lazarus, and is called the appraisal theories of emotions, according to which emotions need cognitive appraisal, and the other stream follows Zajonc, and these are called the biological oriented theories of emotion. The biological oriented theories of emotions are often focused on arousal.

In 1982 Hirshman and Holbrook published their groundbreaking article on consumer fantasies, feelings and fun and a second article on hedonic consumption (Holbrook and Hirschman 1982, Hirschman and Holbrook 1982), calling for more focus on emotional and experiential aspects of consumption. This initiated a track in consumer research focusing mostly on consumer response to advertising or emotions as a result of consumption. Batra and Ray (1986), Edell and Burke (1987) and Holbrook and Batra (1987) have found emotions to be important mediators of cognition and behavioral response to advertising. Emotions as a result of consumption have been studied by e.g. Holbrook et al (1984) focusing on emotions related to products, and Derbaix and Pham (1991) focusing on emotional experiences associated with different consumption situations e.g. vacation, restaurant visits, shopping and hobby related purchasing. Havlena and Holbrook (1986) make a comparative study of two competing typologies of emotions and assess the comparative reliability and validity of the scales. Westbrook and Oliver (1991) studies patterns of emotional response to product experiences by the interrelationship between consumer emotions and satisfaction judgement, and Mano and Oliver (1993) studies post consumption experiences - evaluation, elicited affect and satisfaction. Also Arnould and Price (1993) studies affective dimensions of consumption. They look at extraordinary experiences in the context of white-water rafting and find that affect, narrative and ritual are important factors in the delivery of extraordinary experiences. They experience that it is difficult for consumers to put words on their expected feelings.

The role of emotions and the character of emotional response are complicated matters. Emotions can assume the function of causes, effects, mediators and moderators (Bagozzi, Gopinath and Nyer, 1999). They are not just positive or negative they can also be mixed, which an important research stream in consumer research at the moment is focused on (Lau-Gesk, 2005, Williams and Aaker, 2002 and Larsen and McGraw, 2001). Also anticipated emotions or anticipatory emotions have been called upon (Bagozzi et al., 2000; Perugini and Bagozzi, 2001; Leone, Perugini and Bagozzi, 2005; Baumgartner, Pieters and Bagozzi, 2008). This was followed up by Baumgartner, Pieters and Bagozzi, (2008) on future-oriented emotions, where they stress that the conceptualization of this concept has been unclear since anticipated and anticipatory emotions are different concepts. They build this split conceptualization on a proposal by Loewenstein and Lerner (2003). Anticipatory emotions are according to this conceptualization emotions expected to be experienced in the future if certain events do or do not occur, whereas anticipated emotions are currently experienced due to the prospect of a future event (Bagozzi, Pieters and Baumgartner, 2008: 685)

Recent findings in cognitive neuroscience and Neuroeconomics (LeDoux, 1998; Damasio, 2000, 2003; Loewenstein 2000; Mellers and McGraw 2001) have made it clear that emotions play an even larger role in decision making than so far assumed. The idea of rational decision making and emotion and feelings as noise has ultimately been rejected. Decision-making without the influence of emotions is not possible (Damasio, 2000). Sound and rational decision-making depends on prior accurate emotion processing (Bachara and Damasio, 2005: 336) Thus the importance of including emotional aspects in consumer research is even greater than was earlier recognized.

Neuroscience findings support the notion that emotions can appear prior to cognition but also shows that the influence goes both ways (Damasio, 2000). Neuroscience has given foundation for new research on emotions in consumer research, also known as Neuroeconomics or consumer neuroscience. In advertising neuroscience methods have been applied by e.g. Ambler and Burne, 1999; Ambler, Ioannides and Rose (2000), Du Plessis, (2005); and Hall, (2002). In brand research the contributions have been made by McClure et al. (2004) in form of a classical taste-test between Coca Cola and Pepsi, by performing fMRI (functional Magnetic Resonance Imaging) on the participants. The study supports the traditional finding in taste tests, but the images also shows activation of the reward area in the brain when participant believe to be drinking their favorite brand

explaining the choice behavior as well as documenting the earlier assumption that this is due to the brand effect. Yoon et al. (2006) (which was the first published in JCR¹) test the notion of brand personality, and Hansen and Christensen, (2007) look at emotions related to brands and product categories. Erk et al. (2002) made an interesting study of consumer choice between products in form of different car types finding differences in activation of reward areas related to different types of cars.

Defining emotions

Emotions have been defined in many ways reflecting the theoretical basis of the definition for example psychophysiology and motivational theory (Izard), and clinical psychology and evolutionary psychology (Plutchik) giving little consistency in the definition and clarity of the concept (Richins, 1997; Plutchik, 1980). The diversity of understandings of emotions has affected consumer research where the understanding of emotions also has been somewhat unclear. Several concepts have throughout time covered the emotional aspect of consumptions. Emotions in consumer research have been reflected by the following concepts: Affect, hedonism/hedonic, mood, feelings, and emotions. These words have been used at random not reflecting the actual function of emotions in the light of what is known today. Furthermore there is a widespread tendency in consumer research to not actually defining emotions but instead explaining them by a list of emotion-words that characterizes specific discrete² emotions or by two groups of emotions, positive and negative valenced³ emotions.

According to Richins (1997) one of the clearest explications of the characteristics of emotions, and one that appears to be gaining acceptance was proposed by Ortony, Clore and Foss (1987) and

Ortony, Clore and Collins (1988). According to their proposition an emotion is:

“A valenced affective reaction to perception of situations”

(Richins, 1997, 127)

¹ Journal of Consumer Research

² Discrete emotions refer to separate emotions e.g. happy, sad, satisfied, disappointed etc.

³ Valence is a commonly used expression in consumer research. It addresses the character of a phenomenon and can be positive or negative. In the case of emotions the emotion felt can have a positive or negative character.

Izard (1977), whose emotion scale has been widely applied to consumer research, defines emotions as:

1. *“The experience or conscious feeling of emotion”*
2. *“The processes that occurs in the brain and nervous system”*
3. *“The observable expressive patterns of emotions (particularly on the face)”*

(Izard, 1977, 4)

New findings in cognitive neuroscience have shed light on emotions, what they are and how they interconnect with other functions such as feelings and cognition. One of the most common references on emotions and neuroscience in consumer research is Antonio Damasio.

Damasio defines emotions as follows:

“A collection of changes in body and brain system that respond to specific contexts of one’s perceptions, actual or recalled, relative to a particular object or event.”

(Damasio, 2003: pp)

Emotions and feelings though often used at random are not the same thing (Damasio, 2000, 2003) and mood although similar to background emotions (Damasio, 2000) are longer lasting.

Damasio defines feelings as:

“The perception of a certain state of the body along with the perception of a certain mode of thinking and of thoughts with certain themes.”

(Damasio, 2003: 86)

Affect, a term often used in consumer research, or affective states covers both emotion and feelings (Damasio, 2003) and is thus a less specific concept. Hedonism or hedonic is often used in consumer research as an opposite to utilitarian. Hedonic value for example reflects the entertaining and emotional worth of the consumption (Barbin, Dardin and Griffin, 1994). Hedonic is thus also a broader concept than emotions but interrelated with emotions.

Hansen (2005) supports the separation of emotions and feelings, emphasized by Damasio, from a consumer research perspective and suggests applying this understanding of emotions.

Measuring emotions

An important issue when studying emotions in consumer research is how to measure them. Different methods have been used throughout time to measure emotions in consumer research. These methods have different strengths and weaknesses. In the following the methods will be presented and evaluated.

The methods can be divided in three overall groups: Self report, autonomic measures and brain imaging.

Self report

Self report is the most commonly used method for measuring emotions especially connected to consumer behavior. The main reason for this is that self report involves relatively smaller expenses and does not demand skills that are uncommon to find among consumer researchers. Scholars have found that the use of scenarios in experimental research can generate discrete emotional response (eg. Gopinath and Bagozzi, 1999; Roseman 1991). However, self report is difficult to apply to measuring emotions since emotions are often unconscious or simply hard to define causing bias to the reported emotions.

Based on Damasio's understanding of emotions what is really measured on an emotion scale are feelings of emotions, thus it is more an indication of an experienced emotion than the actual emotion. This will evidently raise the issue of cognitive bias associated with the measurement. However, whether this is a problem or not depends on the focus of the research.

Using self report raises the challenge of choosing or developing a valid and reliable scale. Scales can be either theoretically driven or empirically driven. The problem about theoretically driven scales are according to consumer researcher (Richins, 1997) that they are not obviously suited for a consumer context. Empirically driven scales have been developed specifically for a consumer context. Using an already developed scale can be problematic since the emotion-words on this scale are not adjusted to the particular research focus. Richins (1997) develops a general scale for

measuring consumer experience but suggest that this should be used as a starting point for further development for the specific situation.

A scale for measuring emotions can be either verbal or visual. The most commonly used emotion scales have not been developed specifically for consumer research. Traditionally consumer research has built on psychological theories. This also reflects the measurement of emotions. Often scales from psychology (Plutchik 1980; Izard 1977) have been applied directly to a consumer context. This has been criticized by many scholars (Richings, 1997; Hansen and Christensen, 2007, Schaefer and Diamantopolos, 2008) since emotion scales relevant for psychology in general may not resemble the emotions felt by consumers in a consumption context (Richins 1997; Hansen and Christensen, 2007).

Verbal self report (VeSR)

VeSR is the most expanded method of measuring emotions in a consumer context. This method can be applied in experimental designs, in questionnaires and in interviews. Research is conducted using open ended questions or a battery of emotion items measured by semantic differential or Likert scales. Approaches to emotions and thus to scales can be empirically oriented (Edell and Burke, 1987; Holbrook and Batra, 1987; Richins, 1997; Schaefer and Diamantopolos, 2008) or theoretically oriented (Izard, 1977; Mehrabian and Russell, 1974; Plutchik, 1980; Watson and Tellegen, 1985).

The three most common used measures of emotions in consumer research are all founded in psychology: Izards 10 fundamental emotions from the “Differential Emotions Theory” (Izard, 1977), Plutchiks 8 basic emotion categories (Plutchik, 1980) and Mehrabien & Russell’s PAD-model (Pleasure, Arousal, Dominance) (Mehrabian & Russell, 1974).

Izard’s (1977) framework “assumes that separate and discrete emotions exist and that each has measurable experiential and motivational properties” (Izard, 1972: 85). Izard’s (1977) Differential Emotions Scale measures 10 fundamental emotions.

Izard's fundamental emotions	Interest, Enjoyment, surprise, distress (sadness), anger, disgust, contempt, fear, shame/shyness, guilt
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Fig 1: Differential Emotions Scale (DES) (Izard, 1977)

From an evolutionary perspective (Emotions linked to survival jf. Darwin, ((1879), 1979)) Izard partly bases his 10 fundamental emotions on emotions that are universally associated with and recognized in distinct facial expressions (Richins, 1997). Izard's (1977) Differential Emotions Theory (DES) is available in four forms. In consumer research DES-II is the most used of these. It contains 30 adjective items that divided in three groups measures each of the ten fundamental emotions (Richins, 1997).

Izard's typology has been used in a variety of consumer research contexts. Allen et al. (1988, 1992) used it to measure emotions in advertising; Batra & Ray (1986); Westbrook (1987) and Westbrook & Oliver (1991) focused on post-purchase emotions and satisfaction.

Izard's Differential Emotions Scale has been criticized for being too narrow and with too much emphasis on negative emotions (Richins, 1997). This makes it unsuited for measuring emotions related to many consumption situations e.g. experiential consumption, where positive emotions play a central role.

Plutchik (1980) also used an evolutionary perspective to identify eight primary emotions that are survival oriented.

Plutchik's primary emotions	Fear, anger, joy, sadness, acceptance, disgust, expectancy, surprise
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Fig 2: Plutchik's primary emotions (Plutchik, 1980)

Later he developed the Emotions Profile Index (EPI) (Plutchik & Kellerman, 1974), which was used to measure human emotions. The index contains 62 forced-choice emotion descriptor pairs. Responses are transformed into scales representing each of the eight emotions. Plutchik's primary

emotions are assessed to be too narrow since they are all survival related. Emotions in a consumer context are not necessarily survival related.

Plutchik was introduced in advertising by Zeitlin & Westbrook (1986). Plutchik has mainly been applied in advertising research. Holbrook & Westwood (1989) have developed a shorter version of Plutchik's primary emotions.

Both Plutchik and Izard have been criticized for their basic emotions approach. Scholars have found no evidence of the notion of basic emotions as a foundation that should explain other emotions (Richins, 1997).

Mehrabien and Russell's (1974) PAD-model (Pleasure-arousal-dominance) are founded in environmental psychology and measure the individual's emotional responses to their environment. The idea of the PAD model is that all emotions have two dimensions and that all emotions fit into one of the three categories: Pleasure, arousal and dominance. PAD contains 18 semantic differential items, six for each P, A and D. PAD was not specifically intended for measuring emotions and is thus not suitable for measuring specific emotions.

Within consumer research PAD has been used in various contexts. Donovan and Rossiter (1982) and Sherman, Mathur and Smith (1997) applied the PAD-model in a retail environment. Holbrook, Chestnut, Olivar and Greenleaf (1984) applied the PAD-model to a study of consumer experience related to play (e.g. games, sports and leisure activities), Hui and Bateson (1991) used PAD in a study of the physical environment and perceived control in a service encounter, and Olney, Holbrook and Batra (1991) applied PAD to a study of advertising effect and viewing time.

Richins (1997) point out that the PAD-model of emotions could be relevant when measuring consumer response to retail environment but the validity for the measurement of emotions in interpersonal interaction cannot be assumed. Furthermore PAD measures underlying dimensions, which means it cannot measure discrete emotions. Critique specifically linked to PAD is that the scale has very low discriminate validity (Groeppe-Klein, 2004)

One other model that should be mentioned is the PANAS-model (Positive And Negative Affect Schedule). The model was made explicitly from Watson et al. (Watson & Tellegen, 1985; Watson, Clark & Tellegen, 1988; Watson & Clark, 1992). It measures positive and negative affect as two mutually independent dimensions. Originally it was designed to measure a mood scale but has been applied to measure product and service satisfaction by Mano and Oliver (1993) and Dubé and Morgan (1988) and to measure post-purchase affect by Mooradian and Oliver (1997) and finally to measure negative affect in advertising by Huang (1997).

Positive affect (PA)	Attentive, interested, alert, excited, enthusiastic, inspired, proud, determined, strong, active
Negative affect (NA)	Distressed, upset, hostile, irritable, scared, afraid, ashamed, guilty, nervous, jittery

Fig 3: Positive Affect and Negative Affect Schedule (PANAS) (Watson, Clark and Tellegen, 1988)

A few scholars have compared the scales (Machlei and Eroglu, 2000; Havlena and Holbrook, 1986). Havlena and Holbrook (1986) compared Mehrabian and Russell (PAD-model) to Plutchik (EPI) in the context of general consumption experience. Machlei & Eroglu (2000) study emotions in a shopping environment. They consider shopping situations as consumption situations where emotional responses are particularly likely to happen. Machlei & Eroglu (2000) compare Plutchik's (EPI), Izard's (DES) and Mehrabian and Russell's (PAD) scales with the intent of finding the most suited for the measure of shopping emotions. In the case of shopping experience Machlei & Eroglu recommend using either Plutchik or Izard instead of Mehrabien & Russell. Choice between Plutchik and Izard should be based on the research question. Izard is considered more suited for looking at unpleasant experiences rather than pleasant. Plutchik is more suited for expectancy and acceptance when studying e.g. salesperson intervention.

Machlei & Eroglu's findings are contradictory to the earlier comparison study by Havlena & Holbrook (1986) where Mehrabian & Russell were considered a better choice than Plutchik for measuring emotions in general consumption experiences. Machlei & Eroglu assess that this is due to the object of study which in Havlena & Holbrook's case was general consumption experiences and not the particular case of shopping. Machlei & Eroglu further adds that Mehrabian & Russell's PAD-model has the advantage of being the only of the three measurements that include the arousal component and the PAD-model also considers the dominance dimension which could be relevant

when the study includes control over one's environment e.g. retail crowding, waiting time etc. (Machlei & Eroglu, 2000: 111).

Also scales developed specifically for a consumer context exist. Often these scales originate from Mehrabian and Russell (1974), Plutchik (1980) or Izard (1977) or if empirically based have extensive similarities to one of these, which both Bagozzi, (1991) and Poels & DeWitte (2006) point out. This is seen in e.g. Holbrook and Batra (1987) with some similarities to Mehrabian and Russell (1974).

Batra & Ray (1986), Edell & Burke (1987), Holbrook and Batra (1987), Aaker, Stayman and Vizina (1988), Burke & Edell (1989), and Mano (1996) all developed their own typology of emotions in advertising. Edell & Burke (1987) and Burke & Edell (1989) developed a three-dimensional model to measure ad related feelings. Aaker, Stayman and Vizina (1988) developed the Ad Feeling Cluster and Batra & Holbrook's (1990) Affective Response to Ad categories provides affective response categories to profile ads. As it can be seen all of these contributions are ad-related and their appropriateness in general consumption context is unknown.

Richins (1997) presents an emotion measure for diversified consumer contexts called the Consumer Emotions Set (CES). Richins (1997) starts out with an empirically based list of 47 emotions and narrows it down to CES, which contains 17 consumer emotion-words or categories (7 positive, 8 negative and 2 others).

Positive emotions	Romantic love, love, peacefulness, content, optimism, joy, excitement
Negative emotions	Anger, discontent, worry, sadness, fear, shame, envy, loneliness
Others	Surprise, other items (guilty, proud, eager, relieved)

Fig. 4: Consumer Emotions Set (CES) (Richins, 1997)

The CES emotions are emotions only experienced directly from consumption situations and not from advertising. The scale is based on a multidimensional scaling approach. Richins (1997) investigates the existing scales used in consumer research with primary focus on Izard (1977), Plutchik (1980) and Mehrabian and Russell (1974) and the here on founded scales. She concludes

that none of the commonly applied scales are appropriate to apply directly to a consumer context, although they make a good foundation to start from. A number of problems are related to applying the existing scales to consumer research: 1) The scales largely ignores emotions that are central to peoples lives e.g. love, 2) The scales use terms unfamiliar to many people, such as “melancholy”, and not part of peoples everyday vocabulary. Furthermore some scales are confusing e.g. PAD scale use opposite anchor points that are not really opposites e.g. bored and relaxed, 3) Emotions are context specific and thus the appropriateness for a consumer context are unknown until this has been tested further. Consumer emotions tend to be less extreme in character than generally experienced emotions (Richins, 1997).

Another problem about the existing scales is that they are extremely long, which may be possible to apply in a laboratory experiment but is less suitable for a survey or a field study (Richins, 1997)

Hansen, Percy and Lundsteen (2006) developed an emotion scale for measuring emotions in a brand context. They point out that using general psychological scales are not optimal in a consumer brand setting, since emotions connected to brands differ somewhat from emotions in a general perspective. Hansen, Percy and Lundsteen (2006) refer to Ekman (1980), Damasio (2000, 2003) and Le Doux (1998) in their understanding of emotions as well as the Rossiter and Percy Grid⁴ (Rossiter and Percy, 1997). They come up with a 24 item battery scale of emotions associated with brands. They divide the reported emotions and strength of emotions into two categories of positive and negative emotions and calculate a NERS score (Net Emotional Response Strength). They conclude that emotions and feelings are key parts of experiences, and that they will be associated with these experiences in memory. This is the case both in terms of actual use and in terms of understanding.

Schaefer and Diamantopolos (2008) agree with Richins (1997) regarding the problem connected to applying general psychological scales to a consumer context. They develop a scale specifically for emotional response to service encounters, the ESRE (Emotion During Service Recovery Encounters) scale. A scale that they show is valid and reliable for studying the role of emotional response to service failure and recovery encounters. The ESRE-scale is developed on a basis of PANAS, PAD and DES (Plutchik).

⁴ The Rossiter and Percy Grid is a matrix showing *Type of motivation (informational, transformational)* and *Type of decision (low involvement, high involvement)* (for more see Rossiter and Percy, 1997)

A recent contribution touching the subject of measuring emotions is Baumgartner, Pieters and Bagozzi (2008). They suggest a clearer conceptualization of future-oriented emotions considering both anticipated and anticipatory emotions. Anticipated emotions can in principle be all emotions but some are more likely to have a motivating effect than others. Anticipatory emotions are more limited.

	Positive	Negative
Anticipated emotions	Relieved, Satisfied, Happy, Proud	Disappointed, Annoyed, Regretful, Stupid, Guilty, Angry at self
Anticipatory emotions	Optimistic, Confident	Worried, Anxious, Uncomfortable

Fig. 5: Anticipated and anticipatory emotions (Baumgartner, Pieters and Bagozzi, 2008)

Other considerations in scale development should be taken into account. Bagozzi, Wong and Yi (1998) found that bipolarity vs. uni-polarity in emotions is dependent on culture and gender. Bagozzi et al. (1999) advise using uni-polar scales instead of bipolar scales of emotional response. Furthermore they recommend using at least a five point scale but preferably seven to nine scale steps. This is a bit more than Richins (1997), who recommend 4-6 scale points.

The advantages of using VeSR (Verbal Self Report) are that it is relatively simple, cheap and quick to use, however there are some important limitations. They involve a long list of emotion adjectives and the rating can cause fatigue in the respondents which can damage the reliability. Furthermore verbal self report involves cognitive processing, which may distort the original emotional reaction. This problem, according to Poels and Dewitte (2006), only exists for lower order emotions⁵. For higher order emotions⁶ this is not a disadvantage since cognitive appraisals are needed (Poels and Dewitte, 2006). It can be argued that what is measured is the perception of the emotional response rather than the emotional response itself. The impact of this on validity thus depends on what the purpose of the study is. Other validity problems can be inability to report emotions, because

⁵ Lower order emotions: Emotions that happens automatic and without cognitive processing e.g. pleasure and arousal.

⁶ Higher order emotions: Emotions that depends on deeper cognitive processing and need to be consciously labelled as with a specific emotion-word.

respondent are not aware about exactly how they feel, or unwillingness to report their emotions because of social concerns (Poels & Dewitte, 2006).

To sum up, there are some important considerations to make when using self-report. It is important to consider whether self-report is relevant for the purpose of the study, and if found to be, how the scale should be constructed. Scale construction can be time consuming and difficult. Sometimes existing scales can help but there are still aspects to consider. The scale should be suitable for the context; it should include relevant emotion words that are familiar to the participants and it should be noted that emotions in a consumer context are likely to be less extreme than in general. Scales can be unipolar or bipolar and if bipolar scales are found to be the most useful it is important that these poles are in fact opposites. The scales should also be as short as possible, especially if the research is not performed in a laboratory setting.

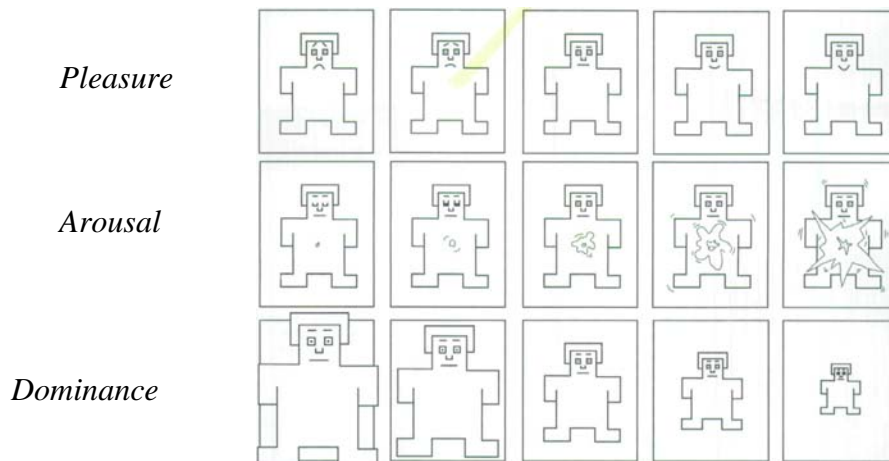
VeSR is also the most commonly used method for measuring future-oriented emotions. It is to my best knowledge the only method so far applied to measuring future-oriented emotions in consumer research.

Visual self report (ViSR)

ViSR has a lot in common with the VeSR techniques. In this case instead of using emotion words the emotions are represented by cartoon-like figures or “smilys”. The main approaches used are:

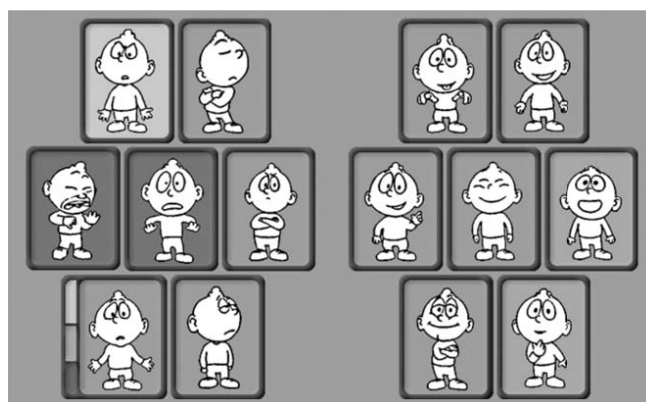
- Self Assessment Manikin (SAM), (Lang, 1980)
- AdSAM (Morris et al., 2002).
- PrEmo (Desmet, 2002)

SAM is based on Mehrabian and Russel’s PAD-dimension (Pleasure-Arousal-Dominance). Respondents indicate which figures best represent their emotional states. AdSAM is a further development of SAM where 232 emotion words were scored on SAM and plotted in a two-dimensional space with pleasure and arousal on the two axes. SAM has shown problems related to the dominance dimension, which respondents seem to experience difficulties in relating to. Furthermore the arousal pictures might have an interpretation issue related to reading the figure.



Figur 6: Self Assessment Manikin (Morris, 1995: 65)

PrEmo uses 14 animations of 1-2 seconds. Each animation represents a specific emotion. Respondents indicate how strongly the target stimulus makes them experience each of the 14 emotions represented by the puppets. With PrEmo more than one specific emotion can be registered making it suitable to study mixed emotions. ProEmo was originally developed to measure emotional response to design but has also been applied to advertising (Poels and DeWitte, 2006). ProEmo is considered user friendly, valid and cheap (Poels and DeWitte, 2006)). ProEmo further makes it possible to measure more separate emotional aspects than SAM and due to the animations contra the still drawings this can help the interpretation of the drawings.



Firgur 7: Examples of animations in still-version from PrEmo (Desmet, 2005: 5)

The advantages of using visual self report instead of verbal self report is that it is faster and less boring than verbal self report. Visual data are also suitable for cross cultural research and research

with children (Morris, 1995; Poels & DeWitte, 2006). However, as pointed out by Poels and DeWitte (2006) ViSR does not solve the issue concerning the cognitive bias. It is still the perception of the emotion and not the actual emotion that is being measured. The significance of this bias tendency depends on the objective of the research and should only be considered a problem on validity when measuring lower-order emotions.

Movement-to-movement ratings

Movement-to-movement ratings involve movement of a pencil on a piece of paper while viewing a commercial – a so-called “warmth monitor”. Movements are supposed to indicate how warm the respondent’s feelings are at any given time (Aaker, Stayman, and Hagerty, 1986). The technique has mostly been used to measure emotions in advertising. A similar tool was used by Baumgartner, Sujan & Padgett (1997) integrating movement-to-movement ratings into overall ad judgement. Rossiter & Thornton (2004) used movement-to-movement ratings to measure fear relief.

Movement-to-movement ratings offer immediate and continuous measures of emotional response. It is cheap, and easy to understand and use, however it is important to notice that it only measures one dimension. Vanden Abeele & MaClachlan (1994) found it a reliable instrument for measuring warmth in advertising but suggest a lack of discriminant validity. The experience of using movement-to-movement ratings is primarily related to an advertising context.

Method	What is measured	How is it measured	Advantages	Disadvantages
Verbal Self Report (VeSR)	Feelings of emotions	Participants report emotions stating own words or using emotions scales	Relatively cheap Relatively simple Possible to report specific and discrete emotions Can be applied to different situations: Lab experiments, questionnaires and interviews	Long list of emotion words causing fatigue Dependent on cognitive processing Measures are often retrospective Participants inability to report (unawareness or unwillingness) Need scales that are specifically adjusted to the context. Scales can be confusing
Visual Self Report (ViSR)	Feelings of emotions	Participants report emotions stated by pictures or animations representing different emotions	Relatively cheap Relatively simple Relatively quick to use Relatively fast to report Possible to report specific emotions (PrEmo) Suitable for cross-cultural studies and studies with children	Dependent on cognitive processing Measures are often retrospective Participants inability to report (unawareness or unwillingness) Scales can be confusing (especially SAM)
Movement-to-movement ratings	Warmth of feelings	Movement of pencil on paper	Relatively cheap Relatively simple Relatively quick to use Continues measures	Only suitable for limited contexts Problem with discriminant validity One-dimensional

Autonomic measures

Psychological measurement has been used in consumer research as early as the 1920s mostly applied to measuring response to advertising (Bagozzi, 1991).

Autonomic measures rely on bodily reactions that are partially beyond an individual's control. It therefore overcomes the cognitive bias linked to self report. Most autonomic measures are conducted in a laboratory setting, which it is often criticised for, since it is considered out of social

context. However lab experiments are commonly used in both psychology and in cognitive neuroscience as well as consumer research. The advantages of using lab experiments are that you can control for different noise parameters that would otherwise be difficult to detect. The technological development have made it possible to apply some of the methods in a consumer context e.g. in grocery stores.

Facial expressions

Measurement of facial expressions is commonly used in psychology. Applying this method requires specific professional competences. All humans are capable to some extent to read other peoples facial expressions and use them in social interaction, however using the method for doing scholarly research calls for a more systematic and scientific approach to reading facial expressions, which is uncommon to find among consumer researchers.

Two primary methods have been included here. First of all there is the Facial Action Coding System (FACS). FACS codes visible facial muscle movement and links to specific emotions. It can only be used if the changes in muscular activity are strong enough. FACS has been made computer aided which makes it more approachable (Cohn and Kanada, 2007). FACS has been used by Derbaix (1995) to compare verbal emotional responses and coding of facial expressions to a set of commercials. Derbaix (1995) found that FACS is not suitable to use in advertising studies, because the changes in muscular activity are often too vague to measure with FACS.

The second method is Facial electromyography (EMG). EMG measures facial expressions more precise than FACS since it can measure facial muscle activity even though there are no changes in facial expressions. The critic of this method is linked to the setting of the measurement, since it must be conducted in a lab. Furthermore respondents may be affected by the fact that they know they are being measured and therefore try to control muscle reactions (Bolls, Lang and Potter, 2001). EMG has been applied by e.g. Hazlett and Hazlett (1999) in advertising research to compare emotional reactions to TV commercials.

Electrodermal reaction

Electrodermal reaction (EDR) or Skin conductance measures activation of the autonomic nervous system. Activation of the autonomic nervous system indicates 'arousal' (Ravaja, 2004). The EDR measure indicates the electrical conductance of the skin related to the level of sweat in the eccrine sweat glands which is involved in emotion-evoked sweating and is conducted using electrodes. Skin conductance can be measured on the whole body but are more sensitive on the palms and soles of the feet (Dawson, Schell and Filion, 2000).

EDR is a sensitive measure of arousal. However it requires a lot of experience and sensitive equipment. It is therefore best carried out by experts. Furthermore EDR only measures the occurrence of arousal not the valence of the arousal, which can be both positive and negative. Another problem with using EDR are the individual variation and situational factors such as fatigue, medication etc. (Hopkins and Fletcher, 1994), which makes it hard to know what you are measuring. Furthermore measuring arousal may not be the only purpose of the research. The equipment can be carried in a bag and the study can thus be performed in various contexts.

According to LeDoux (1996) arousal is multidimensional. Multidimensionality in arousal is subject to discussion, and it is not really known if arousal is multidimensional or not, but if arousal in fact is multidimensional it can bias the measurement because EDR cannot measure valence.

EDR has been used to measure arousal of consumers in grocery stores indicating particular attention of the consumer toward an object or product (Groeppl-Klein, 2005) and in advertising research to measure influence of archetypes in reaction to commercials (Groeppl-Klein, 2006) and to validate other arousal measures (Aaker, Stayman & Hagerty, 1986; Bolls, Lang & Potter, 2001).

EDR is considered interesting and useful to measure arousal but since it only measures one dimension of the emotional experience, and the role of arousal in the emotional experience is not yet fully understood, it is necessary to combine it with other measures. Furthermore it should be considered whether it is worth the effort, since it is time-consuming to perform the EDR experiments.

The use of EDR in a future-oriented perspective is to my best knowledge non-existing in consumer research but it has been used in conjunction with heart rate measures in psychology in connection with risky choice (Crone et al., 2004).

Cardiovascular Responses

Heart rate can be used as an indicator of various phenomena: Attention, arousal and physical effort. Phasic⁷ changes in heart rate indicate attention and tonic⁸ changes indicate arousal (Poels and DeWitte, 2006). Heart rate allows for measure of the valence of arousal (Greenwald, Cook and Lang, 1989). Heart rate can be operationalized as number of milliseconds since the previous heart beat (Lang, 1990, Poels and Dewitte, 2006)

Generally heart rate measures are considered to be a valid measure of arousal, valence or attention. However results need to be interpreted with caution since several phenomena can occur at the same time, affecting the heart rate in different direction thus causing bias (Poels and DeWitte, 2006). Heart rate as indicator of emotional response should not be used as single measurement method but could be combined with e.g. skin conductance to indicate valence (Hopkins and Fletcher, 1994). Heart rate has been used as a method for measuring the impact of arousal on information processing capacity (Sanbonmatsu and Kardes (1988) and for measuring emotional response to advertising stimuli (Lang, 1990; Bolls, Lang & Potter, 2001) but otherwise the experience with the method in consumer research is limited.

Eye-tracking

The measurement of eye-movement appeared in consumer research in the 1970's, however, only few studies were performed (Bagozzi, 1991) e.g. Treistman and Gregg (1979) examining eye-movement response to catalog ads measuring average viewing time as an indicator of high and low performing ads. The concept of eye-tracking is linked to the measurement of emotions in the sense that it measures attention and that attention is more attracted by e.g. emotionally triggering images. Eye-tracking measures on attention can thus be an indication of emotional reactions. However since eye-tracking is an unsure measure of emotions it is not considered relevant to use it as a stand-alone method when studying emotional aspects. It can however be useful to combine with other methods for some problems.

⁷ Phasic changes are short term changes in heart rate.

⁸ Tonic changes are long term changes in heart rate.

Eye-tracking have mostly been applied to studies in advertising research where attention play a large role. But can also be used in in-store decision-making (retail-stores). It has been used to study attention toward health warnings in cigarette advertisements among adolescents (Krugman et al. (1994) and to study attention wear-out and the impact of repetition on advertising effectiveness (Pieters, Rosenbergen and Wedel, 1999) and finally to measure the value of point-of-purchase marketing (Chandon et. Al., 2007)

Method	What is measured	How is it measured	Advantages	Disadvantages
Facial Expression	Movement of facial muscles indicating emotional reaction	Human or computer aided interpretation according to coded system. Can also be measured by attaching electrodes to face	Autonomic Not dependent on cognitive processing	Requires expert knowledge uncommon to consumer researchers Emotional response need to be relatively strong (FACS) Can only be performed in a laboratory Sensitive to noise e.g. in form of participants reaction to the unaccustomed situation
Electrodermal reaction (EDR)	Conductance of the skin indicating arousal	Electrodes are placed primarily on the palms and soles of the feet	Autonomic Not dependent on cognitive processing	Requires expert knowledge uncommon to consumer researchers Time consuming Noise in form of participants reaction to the unaccustomed situation Requires investment in special equipment Can only measure one dimension of emotions (arousal)
Heart rate	Number of milliseconds since previous heart beat (attention) and tonic changes (arousal)	Electronic device on e.g. finger	Autonomic Not dependent on cognitive processing	Time consuming Requires expert knowledge uncommon in consumer researchers Noise in form of participants reaction to the unaccustomed situation Requires investment in special equipment Can only be performed in a laboratory Several phenomena can happen at once making measurement difficult
Eye-tracking	Eye-position and eye-movement indicating attention	Camera focused on the eyes of the participant often in front of a screen showing a video.	Autonomic Not dependent on cognitive processing	Not measuring emotions but only attention which can indicate emotional reactions Requires investment in special equipment

Brain imaging

Brain imaging is a new method in consumer research. The method has entered from neuroscience and offers the opportunity for interesting new insights. Emotions are pointed out as an area of specific relevance. However the method is extremely expensive, it requires expert knowledge and has severe technological limitations for experimental designs. Furthermore knowledge within neuroscience is still relatively young and therefore the complexity of the problems investigated must be relatively simple. The use in consumer research is so far relatively limited and thus are the examples of use related to measurement of emotions in consumer research. The most commonly applied methods from neuroscience are the following:

Electroencephalography (EEG)

EEG is the oldest imaging method. It is also the least expensive and most widely available brain imaging method and the data analysis is relatively less complicated than for other brain imaging methods. It measures electronic activity on the outside of the brain using scale electrodes and can only measure the outer areas of the brain, which makes it unsuitable for measuring emotional aspects that are situated in the limbic system in the mammalian brain. However it has a good temporal⁹ resolution making it very suitable for some studies, especially if the focus is on when an action occurs. EEG has been applied in advertising research to study television ads versus print ads in magazines (Krugman, 1971), to study response to TV commercials (Rothchild et al., 1998), memory for components of TV commercials (Rothschild and Hyun, 1990) and to study the impact of affect on memory in advertising (Ambler and Burne, 1999).

Magnetoencephalography (MEG)¹⁰

MEG measures magnetic fluctuations in the brain non-invasively. It has not been applied much to consumer research and the equipment is not as common to find as EEG. MEG is conducted using scale electrodes attached to the scalp like with EEG, however to make this a better measure it is performed very sensitive to magnetic noise, which means it must be conducted in a magnetic shield room (Hämäläinen et al., 1993). MEG has a good temporal resolution, like EEG, but a limited spacial¹¹ resolution – although better than EEG. Considering only the results it is assessed to be

⁹ Temporal resolution refers to the time precision of a measurement.

¹⁰ MEG can be combined with a structural image, a so-called magnetic source image (MSI), which improves the method.

¹¹ Spacial resolution refers to the degree of detail of the image.

better than EEG, however, the method is also more expensive and more complex to analyse. Furthermore it is less available.

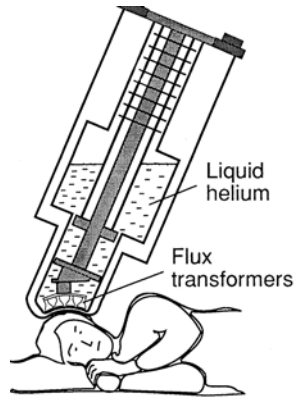


Figure 8: MEG equipment. (Hämäläinen et al., 1993)

MEG has been applied by Ioannides et al. (2000) to measure differences in brain activation during exposure to affective and cognitive ad stimuli. Ioannides et al. (2000) were the first to use MEG in advertising research. Ambler et al. (2004) used MEG to study brand choice in a super-market frame and the role of familiarity of the brand.

Positron emission topography (PET)

PET is a nuclear medical imaging technique which produces a three dimensional image or map of functional processes in the brain. The scanning is performed in a full-body scanner. It measures blood flow in the brain using positron emissions after radioactive contrast injection. Contrary to EEG and MEG, PET has a good spacial resolution but this is on the expenses of the temporal resolution. PET is relatively costly and data are complex to analyse. Most importantly it is invasive due to the injection of radioactive contrast. PET is not often used in consumer research because of its invasiveness but there have been examples of use in other areas of Neuroeconomics e.g. by de Quervain et al. (2004) to study punishment in trust games (Camerer, Loewenstein and Pralec, 2004)

To measure future-oriented emotions PET has been used in neuroscience to measure anticipated anxiety (Simpson et al., 2000) showing that at least this aspect of future-oriented emotions can be measured by the technique.

Functional Magnetic Resonance Imaging (fMRI)

fMRI is a technique used for estimating neural activity non-invasively (unlike PET) and with relatively good spatial and temporal resolution. fMRI has a better spatial resolution than EEG and MEG but worse temporal resolution. The spatial resolution however is much better than with PET. Specifically it measures the blood oxygen level dependent (BOLD) signal that strongly correlates with neural activity (Yoon et al., 2006). Thus fMRI can be used to estimate neural activity in active parts of the brain.

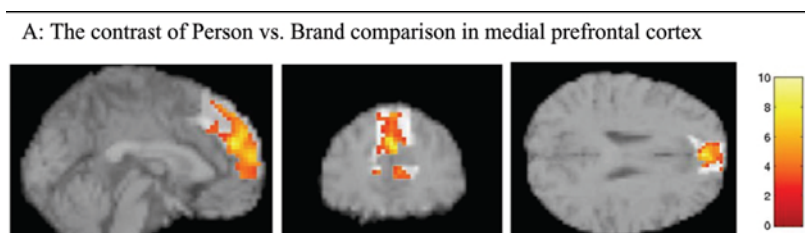


Figure 9: Example of fMRI image (Yoon et al, 2006:7)

The use of fMRI in research has increased over the last twenty years (Berman, Jonides and Nee, 2006) and was introduced in consumer research by Yoon et al. (2006)

Experiments are performed in a full body scanner. Goggles enables participant to view a display with visual, auditory or tactile stimuli. Participants respond to the stimuli by pressing buttons on a pad while the scanner records the BOLD signal (Yoon et al., 2006). A series of scans has to be run for the measurement and it is necessary for participants to lie still in the scanner for 60-90 min., which can be uncomfortable (Yoon et al., 2006) and gives significant limitations to the stimuli that can be used. Furthermore the scanner makes a lot of noise, which add to the discomfort, although this is attempted to be minimized by hearing muffs. The experiment usually takes 1-2 hours (Yoon et al., 2006) and should be performed by special trained investigators. Yet another complication of using fMRI is that to compare subjects images have to be adjusted since the shape and size of the skull varies across individuals. Software has been developed for this. As with other imaging methods fMRI has high measurement costs (but not as high as PET) and data analysis is complex

When using fMRI it is only possible to image slices of the brain, which means that you only see part of the brain in each scan and you cannot see if there is activity in other areas, therefore fMRI is

not suitable for exploratory research. It is necessary to use knowledge from cognitive neuroscience to build hypothesis on which areas will be activated as well as construct a model, thus knowledge in neuroscience directs the possible problems to be investigated.

fMRI has been applied to studying emotional aspects in consumer research by e.g. Deppe et al. (2005) to study the neural correlates of brand choice, by Erk et al. (2002) to study product attractiveness and perception of reward and by Plassmann et al. (2007) to study brand loyalty.

fMRI is the most commonly used method for measuring future-oriented emotions in neuroscience. It has to my best knowledge not yet been applied in consumer research, however to study decision-making fMRI studies have contributed to the study of both prospective outcomes (Kahn et al., 2002) and anticipatory affect in choice (Knutson and Greer, 2008)

Details and evaluations of the most common used imaging methods in consumer research can be seen in the table below:

Imaging method¹²	What is measured	How is it measured	Advantage	Disadvantage
Electroencephalography (EEG)	Electric fluctuation	Voltage fluctuation at brain surface	Not dependent on cognitive processing Good temporal resolution Relative cost-efficient equipment and data collection Non-invasive Relatively straightforward data analysis	Very limited spatial resolution
Magnetoencephalography (MEG)	Magnetic fluctuation	Electrical activity in form of changes in magnetic streams measured by fluctuation of voltage	Not dependent on cognitive processing Good temporal resolution Non-invasive	Limited spatial resolution (better than EEG) Relatively high measurement cost Moderate to high complexity in data analysis Uses magnetic fields which excludes use of test subjects with ferromagnetic ¹³ implants
Positron-emission-tomography (PET)	Changes in metabolism	Measures metabolic activity. Application of radioactive contrast	Not dependent on cognitive processing Good spatial resolution	Very poor temporal resolution Invasive Relatively high measurement costs (higher than fMRI) Complex data analysis High claustrophobic anxiety risk
Functional magnetic resonance imaging (fMRI)	Changes in metabolism	Measures metabolic activity using the magnetic properties of blood	Not dependent on cognitive processing Good special resolution Non-invasive	Relatively low temporal resolution (lower than EEG and MEG, but much better than PET) Relatively high measurement costs Complex data analysis High claustrophobic anxiety risk Noisy Use of magnetic fields excludes use of test subjects with ferromagnetic implants

¹² Kenning et al. (2007)

¹³ Ferromagnetic implants contain iron that can be magnetised.

Evaluation of and reflection on methods and their relevance

Many autonomic measures are limited to the measurement of arousal, and have limitations that mean that results might not commensurate the effort. Using autonomic measures is complicated since expert knowledge of operating equipment is necessary – a knowledge not very common among consumer researchers. Even though new technology has been developed that helps the process as well as improves the opportunity to use the methods, this kind of instruments are costly investments. Furthermore performing experiments using these methods is more time consuming per subject and much more expensive to perform than self-report. It is also expected to be more difficult to attract subjects to participate both because it will be time consuming for the individual but also because some subjects might feel alienated by the equipment.

Autonomic measures seem to have the advantage of supplying data independent of cognitive processing; however a lot of bias still exists. Methods like EDR, heart rate and facial expressions have been available for a long time but are not commonly used. They are generally assessed appropriate for measures of arousal, however the potential for studying emotions are not obvious and the same also counts for future-oriented emotions.

Using brain imaging could be potentially rewarding when looking at emotions as also pointed out by Yoon, Gonzales and Bettman (2008). It is difficult for subject to put word on emotions, sometimes they are mixed and often they are not even conscious. This has been a large problem for consumer research so far, and thus emotional aspects in consumption have not been thoroughly studied.

Brain imaging techniques offer a new opportunity for studying emotions without depending on cognitive processing and subject's ability to recognize and communicate emotions. Brain imaging has contributed significantly to the knowledge of emotions and decision making within neuroscience. The methods offers an opportunity to give answers that we have earlier only been able to guess. However the fMRI studies should not stand alone but be combined with e.g. self report, choice, eye-tracking etc.

Different imaging methods have different strengths and weaknesses. Their appropriateness depends on what is being studied as well as the invasiveness. The most commonly used imaging method in

consumer research is fMRI. EEG has interesting possibilities and it is more approachable (wider availability and less expensive), however it is weak concerning measures of emotions and the experience with measurement of future-oriented emotions are lacking. PET is considered ethically un-wise to apply to consumer research due to invasiveness. MEG offers better temporal resolution than fMRI but so does EEG and EEG is cheaper to use and more accessible. fMRI offers high spacial resolution and is assessed to offers intriguing new insights but it is also complicated to use and demands cross-disciplinary cooperation. Furthermore it is extremely expensive and time consuming to perform. The practical and financial challenges aside the method is relevant to apply to the study of emotions in consumer research. For the study of future-oriented emotions fMRI has had a great influence in neuroscience and thus it is assessed to be potentially rewarding for consumer research in this area as well.

In relation to consumer research the methods should not be seen as a replacement for more traditional methods but as a supplement. They make it possible to evaluate assumption commonly made in consumer research e.g. regarding brand personality (Yoon et al., 2006) and offer an opportunity to both accept and reject as well as to study phenomenon that was earlier extremely difficult to study.

So far the imaging techniques have severe limitations, and a lot of the knowledge neuroscience can contribute with about emotions, decision making and brain functions are still relatively young. Neuroscience is constantly developing new methods for testing and gaining more knowledge on the brain and its role in human behavior, it is thus expected that the opportunities for these methods in consumer research are increasing and so is the interest judging from its position at the ACR (Association for Consumer Research) conference 2008, not only as a single session but also as a roundtable discussion.

The experience in consumer research on performing fMRI is, although increasing, still limited and there are many potential pitfalls to consider. Guidelines on what to consider is given by Yoon, Gonzales and Bettman (2008):

- 1) The method, fMRI, should be appropriate given the research question at hand.
- 2) There should be a proper conceptualization and operationalization before starting the experiment. Meaning that an ex ante neurobiological model must be developed as well as clear expectations of neural processes and correlates.
- 3) Do not lose sight of the behavioral rigor
- 4) The fMRI study should not stand alone. Convergent validity should be sought out by linking to other behavioral measures (e.g. self-report, eye-tracking, choice etc.)
- 5) Experiments should be carefully designed
- 6) Abundant trials should be performed
- 7) Large enough samples should be used

Concerns have been expressed related to the use of neuroimaging methods in a marketing context. The fear is related to the possibility of manipulating consumers into buying. However, there are no signs of a “buy-bottom” yet. The possibilities are nowhere near that specific and we are still on a much grounded level of research. Furthermore it is only possible to do group studies and not individual studies and since participants have to lie in a full body scanner this is not possible to perform without participant’s knowledge and acceptance. Studies are usually performed with around 20 participants, which make it unsuited for generating traditional market data for practitioners. In addition to this concern it should also be noted that the same concerns were expressed when psychology first entered the field and that concerns regarding new methods should always be expected.

Another concern expressed is the risk of cancer related to the exposure to magnetic fields and radio waves. This risk has been thoroughly investigated and there are no evidence suggesting the there is a risk connected with MR scanners, although this is not known for extremely high tesla¹⁴. Studies currently investigating this is not expected to show any concerning outcome. Furthermore it should be noted that this high tesla is not normally being used in studies with either humans or animals (Hoffman, 2008).

The most commonly used method for the study of emotions in consumer research; self report of emotions has severe limitations. Emotions are a complicated topic. Respondents may be unable to

¹⁴ Tesla measures the magnitude of the magnetic field.

assess their own emotions or unwilling to report it. Furthermore the methods hold severe cognitive bias risks. However, the method is still the most approachable in consumer research. The technique has also been used to study future-oriented emotions and even though this, likewise, cause severe problems it is the only technique so far applied to consumer research.

If applying self-report as measurement of emotions scholars should carefully consider the importance of the effect of cognitive influence as well as the fact that the measure is an indication of the emotion happening and not the actual emotion. If self-report as such is considered relevant, careful considerations about scales (unless movement-to-movement ratings are applied) should be made – whether any of the existing scales are relevant, maybe with adjustments or a new scale should be developed. Existing scales are either theoretically- or empirically driven. The theoretically driven scales primarily emerge from psychology and is often criticised for being unsuited for a consumption context. Richins (1997) CES scale is assessed to be a good starting point since this is developed for consumer research but is a general scale meant to be adjusted to the specific purpose. For the purpose of studying future-oriented emotions Baumgartner, Pieters and Bagozzi (2008) offers important conceptual insight on this areas as well as input on the emotion words to apply.

Self-report, especially VeSR but also PrEmo offers the possibility of measuring various specific emotions, which is not possible to measure using brain imaging or autonomic measures. If doing cross-cultural studies or studies with children ViSR should be considered. Movement-to-movement ratings are most obviously suitable for an advertising context.

Conclusion

Measuring emotions in a consumer context calls for careful considerations. Several methods are available to apply and has to smaller or larger extend been applied in consumer research. The most commonly applied method in consumer research is verbal self report. This method does not demand unusual skill for consumer researchers and is relatively cheap to use. However it calls for considerations on scales as well as bias to decide whether the method is suitability for the specific research problems - especially related to the impact of cognitive processing. On the positive side it makes it possible to measure several discrete emotions. If VeSR is considered suitable an extensive work with scales is necessary. A scale can be developed specifically for the study and context of the

study but it is also possible to apply an existing scale, although this has been argued against by several consumer research scholars. Visual self report seem to offer an interesting alternative, however the scaling opportunity is more limited and the experiences with using visual self report at least in consumer research are less solid.

For the measurement of future-oriented emotions the task does not become any less complicated. The conceptualization has been unclear in many contributions making it difficult to separate e.g. anticipated and anticipatory emotions. Furthermore it is also difficult for subject to separate these concepts adding to the already problematic task of reporting emotions. The experience with this area in consumer research is limited and VeSR is the only method applied to study this type of emotions.

Autonomic measures have been present in consumer research for many years. It offers alternative possibilities for measuring primarily arousal but most methods are not obvious suitable for measuring emotions as such and thus not for studying future-oriented emotions either. In spite of the technological development related to these methods they are still relatively more expensive and time consuming than self report and taking into account the outcome possibilities it is rarely worth the trouble.

Brain imaging, especially fMRI has recently cord interest in consumer research. It offers intriguing new possibilities but also holds limitations; both for the measure of emotions in general but certainly also for measuring future-oriented emotions. A huge obstacle in applying this method is that it demands specialized knowledge and experience which is extremely uncommon in consumer researchers thus cross-disciplinary collaborations are necessary. Equipment is extremely expensive and the performances of experiments are time-consuming. Furthermore the necessity of studying theories from neuroscience holds a potential barrier to consumer researchers, since this involves quit unfamiliar vocabulary to most consumer researchers. Another problem can be getting participants for the experiment since it is relatively more time consuming than e.g. self report and people might feel intimidated by the equipment. The possible problems that can be investigated is bound by knowledge in cognitive neuroscience to help form hypothesis and technological limitations means that the experiment can only be performed lying down without moving more than fingers and eyes. This challenges the design of the experiment, however new methods are

constantly being developed and especially the fMRI in combination with other methods has been assessed to be a possible contributor of intriguing new insights by scholars.

As it is clear measuring emotions in a consumer context calls for a lot of decisions, some easier to make than others. Which method solves the problem best? Which equipment is realistically assessable? How much money can be spent? How much time is available? Are the right skills available? As it is obvious there is no simple answer to what method should be chosen and it seems much easier to avoid the subject. For the measurement of future-oriented emotions the answers are not getting easier. Does this mean that we should give up on researching emotional aspects? The answer to this question must be no. Emotions are important factors in human behavior in general and necessary to understand consumer behavior and consumer decision making. It is thus important to gain more insight into and experiences in using the different methods for measuring emotions and especially for getting further insight into the concept of future-oriented emotions since these types of emotions are assessed to have a large influence on consumer decision making.

New methods for measuring emotions should be explored for new possibilities and older methods should be investigated to improve the methods and gain insight and experience in use in various contexts.

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