AFFECTIVE TOURISM MARKETING

How and Why Place Marketing Companies Attempt to Elicit Hedonic Emotions Using Audio-Visual Stimuli

Thesis submitted for the degree of Doctor of Philosophy at the University of Leicester

by

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ABSTRACT

This thesis reports on research into the measurement of emotion in advertising. Its hypothesis is 'the presence of three precognitive stimuli - voice, music and face - in adverts will cause a corresponding emotional effect in viewers'. This thesis attempts to find a replicable and reliable way of counting the presence of these three stimuli posing a new model of testing adverts for emotional content and responses. The model proposes that adverts are tested from an encoding and decoding perspective and suggests a four-stage process of interview, content analysis, biofeedback test (using electromyography (EMG), heart-rate and skin conductance) and self-report test (using Feeltrace). This model is explained in this thesis then tested using an example of place adverts. Interviewers of some of the encoders of place adverts indicated that eliciting hedonic emotions were one of their aims which was tested by a content analysis which confirmed the presence of voice, music and faces which expressed hedonic emotion. 20 subjects volunteered from the University of Leicester to undergo the biofeedback and self-report experiments, watching 20 adverts for places. The results showed that the stimuli had a hedonic effect on the biological and cognitive aspects of emotion but there was no significant correlation between the level of hedonic stimuli in the adverts and the responses.

CHAPTER OUTLINE

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List of Programs Used

Details of the software used to analyse the emotional content in audio-visual texts

Programs to Analyse Music

MATLAB (Matrix Laboratory)
Developed by MathWorks.
Commercially available from
http://www.mathworks.com/products/matlab/
Allows computer analysis of sounds with the add-on freeware Miditoolbox

Miditoolbox
Developed by Petri Toivianen and Tuomas Eerola of the University of Jyvaskyla in Finland.
Freeware
http://www.jyu.fi/musica/miditoolbox/
Allows the computer analysis of music translated into a midi file with Matlab.

MPEG to WAV Converter
Commercially available software from
http://www.008soft.com/index.htm
Converts video into audio to allow Widi to interpret the file

Widi
Commercially available from
http://www.widisoft.com/
Converts music into the quantifiable form of Midi from a WAV file.

Programs to Analyse Voice
SFS (Speech Filing System)
Developed by University College London
Freeware
http://www.phon.ucl.ac.uk/resource/sfs/
Allows transcription and automatically matches letters to the sounds. Has command line function which allows the user to create charts with the phoneme data.

PRAAT
Developed by Paul Boersman and David Weenink at the Institute of Phonetic Sciences, University of Amsterdam
Freeware available from:
http://www.fon.hum.uva.nl/praat/
Gives detailed analysis of the prosodic qualities in voice on pitch means, maximum, minimum, nucleus, jitter etc.

Programs to Analyse Faces

FACSAID
Facial Action Coding System Affect Interpretation Dictionary
Commercially available software from
http://face-and-emotion.com/dataface/facsaid/description.jsp
Developed by Paul Ekman and Wallace Friesen
There are training files and full academic back-up to the methods used. There is also a free online version which interprets FACS information.

IrfanView
Freeware available
http://www.irfanview.com/
This program translates MPEG audio-visuals into a series of Bitmaps (BMP) format stills at 25 frames per second - which allows the categorisation of audio-visual material

Text Pad
Developed by Helios Software Solutions
Commercially available
http://www.textpad.com
Needed for IrfanView as it allows text files to be written in .idx form

Icode
Developed by Iain Matthews (Robotics Institute Carnegie Mellon University) and Xuhui Zhou (Carnegie Mellon University, University of Pittsburgh)
Freeware available via the download section in
http://www-2.cs.cmu.edu/~face/index2.htm
Allows coding of frames from an audio-visual. Records the given code for each frame in .idx format.

Programs to analyse Biofeedback Responses

ProComp Infinti
Developed by Thought Technology Limited
Commercially Available hardware with software
Available from many outlets including:
Bio-Medical Instruments Inc at http://www.bio-medical.com
This is a highly sensitive but portable system which, using SC, EMG, HR or many the types of sensor which are all bought separately, registers changes in a subject's physical state. The accompanying software is designed to memorise the data and has methods of converting it into a variety of ways, including the means, semitones etc.

SPSS
Developed by Lead Technology Inc
Commercially available from:
http://spss.com
Used for the interpretation of results. Allows comparison to be made between sets of statistics using recognised formulae to interpret their similarity or difference levels.

Programs to Analyse Self-Report Data

Feeltrace
Developed by Roddy Cowie, Marc Schroeder, Martin Sawey, Ellen Douglas-Cowie, Edelle McMahon, and Suzie Savvidou at Queen's University, Belfast
Freeware available from:
http://www.dfki.de/~schroed/feeltrace/
Allows self-report of emotion in real-time with an audio-visual recording both the valence (whether positive or negative) and its intensity (strength of feeling). Records the data in a quantitative form in a .txt format.

INTRODUCTION

This thesis reports on research into the measurement of emotion in advertising. Its hypothesis is 'the presence of three emotional stimuli in adverts - voice, music and face - will cause a corresponding emotional effect in viewers'. In order to test this hypothesis, a new method of measuring content and responses has been created.

This thesis aims to provide a reliable way of detecting and measuring the presence and nature of emotional content in audio-visual advertisements and a reliable way of detecting and measuring the extent of emotional responses. Using an example of place adverts, it demonstrates how this new method may be put into practice.

The thesis begins with (1) a discussion of the theoretical debate about emotions. It then discusses (2) why emotions might be present in advertising. It goes on to examine (3) previous research on the measurement of emotion in advertisements and suggests (4) three precognitive stimuli – voice, music and face - that adverts may be tested for which are incorporated in (5) a new way of testing adverts for emotional content and responses based on the presence of these three emotion-eliciting stimuli. Finally, there is a report on (5) the results of an attempt to use this method to analyse the emotional responses of a sample of viewers to a selection of place advertisements.

1) A discussion of the theoretical debate about emotions

Chapter One reviews previous research on human emotions. Emotions are notoriously difficult to define, separately or collectively, but a general definition is suggested which encompasses many of the major theoretical perspectives (Plutchik, 1994). In line with a growing consensus in the academic literature on the subject, it is concluded that both biological and cognitive processes are involved in the creation of emotional responses and

that emotion can be thought of as a two-stage process (LeDoux, 1995; DuPlessis, 2005). It is argued that biological responses to an external stimulus can be the primary trigger for a sympathetic cognitive response (Scherer, 1987). One aspect of emotion theory that is of particular interest in this study is the idea of Stimulus Evaluation Checks – the scanning of the environment for stimuli of emotional importance (Compeau et al, 1998). In the case of advertising it has been argued that viewer attention is achieved first via precognitive scanning for emotional stimuli, which, if present will, second, inform the cognitive centres of the brain to address the advert (Zajonc, 1980). It is argued that three stimuli in adverts – voice, music and face – have such attentioning properties (Schupp et al, 2003) and dependent on their qualities can induce an emotional response in the viewer.

2) Why emotions might be present in advertising

Chapter Two considers why emotions might be used in adverts. Advertising has always played on emotions as a selling method - the very nature of rhetoric is emotional. It is argued here that emotional appeals have become more prevalent due to changes in the media environment and audiences. One change which has affected both is information overload in contemporary society where adverts can become more 'noise' (Comanor and Wilson, 1974). Drawing on attentioning theory and the idea of levels of processing (Craig and Tulving, 1975; Mehta and Purvis, 2006) it is argued that emotional appeals are increasingly used to 'cut through' this noise and gain the attention of the viewer. Other reasons why emotional appeals are used include that they are seen to affect the ability to recall the names and qualities of brands (Fiedler 1991; Rolls, 2007) and research into somatic coding has suggested that people store how they feel during the advert along with a memory of the product or service (Pawle and Cooper, 2006). Furthermore, there is an argument that

emotions are the defining factor in persuasion and they, more than rational factors, help consumers make the decision to use a product or service (Damasio, 1994).

3) Previous research on the empirical measurement of emotion in audio-visual texts

In Chapter Three there is a discussion of the ways emotional content and responses to adverts and other audio-visual texts have been studied using quantitative methods. The chapter starts with a discussion of the available methods of analysing audio-visual texts in order to detect emotional content and considers the pros and cons of using interviews of encoders of adverts and content analysis.

Following this, ways of measuring emotional responses are discussed. Technological improvements in brain scanning have meant that adverts can be shown to viewers and the 'hemodynamic events' (Norris et al, 2007) or blood movement in the brain measured. This neuroscientific method has reportedly been used by advertisers and gives quantifiable results and can measure patterns in response (DuPlessis, 2005). What it is less successful at doing is identifying which emotions are affected, as it records oxygenated blood movement to a general area of the brain from which it is difficult to distinguish the actual feeling experienced or level of intensity. A second method that has been used to measure emotional response is to record biofeedback in viewers by using electromyograph (EMG) and electroencephalogram (EEG) equipment. These record changes in the subject's physical arousal states which are partly due to emotional change. Biofeedback responses can measure types of emotion and their intensities and have the benefit of being able to read precognitive responses (Marci, 2006). There is debate over whether biofeedback is emotion (Sloboda and Juslin, 2001) and the neurological pathways of biofeedback response are still unknown (Carlson and Hatfield, 1992). Nevertheless, biofeedback measurement is a sensitive and

precise (Hazlett and Hazlett, 1999) way of gaining quantitative data on emotional responses. Finally, self-report methods allow the known emotional responses of the audience to be quantified. Self-report of emotion has problems of being reliant on the individual's oral ability, awareness of own feelings and the issues about how emotions are defined by the individual (Plutchik, 1994). These problems are limited by using a method of recording feeling that does not rely wholly on words and allows a real-time record of feelings which limits the problem of 'duration neglect' where subtle feelings are forgotten in recall (Gray and Watson, 2007).

4) Three empirically testable precognitive stimuli

Chapter Four assesses the viability of testing adverts for stimuli which may have a precognitive effect. Colour, words and laughter may have the ability to affect the individual in a precognitive manner but there are problems with empirically testing their presence and questionmarks over their precognitive qualities. Voice, music and faces, however, have precognitive qualities, can be quantified and it is it these three stimuli that will be at the centre of a new method for testing adverts for emotional qualities.

5) A new way of testing for the presence of emotion in adverts

Chapter Five describes a new method of detecting the presence and nature of the emotional content in adverts based on three stimuli – voice, music and face.

The method measures emotional responses from an encoding-decoding perspective (Juslin and Luakka, 2003) arguing that it is useful to interview advertisers to investigate their intentions. These interviews can give insights into the types of emotion targeted. This allows

a hypothesis to be formed about which emotions will be present in the adverts. This hypothesis can be tested by a content analysis.

The content looked for is three key stimuli - voice, music and face - because of their attentioning properties and ability to indicate to the audience a type of emotional response. The nature of these stimuli and the features which determine their emotional quality are identified. The voice prosody in the advert can be analysed based on the criteria of Scherer (1987), Cahn (1990), Murray and Arnott (1993), Paeschke and Sendlmeier (2000) among others. The emotional properties of music in the adverts can be similarly quantified based on the criteria of Motte-Haber (1968), Booth-Davies (1978), Gabrielsson and Lindstrom (2001) among others. For faces, the Facial Action Coding System (Ekman and Friesen, 1978) enables quantification of this emotional feature. After a coding schedule is produced the content of the advert is assessed using a semi-automatic method. Using the computer programs MATLAB and Miditoolbox the emotional nature of the music in the adverts can be quantified. Using the computer programs PRAAT and Speech Filing System the emotional properties of speech in the advert can be quantified. Faces are quantified using the computer programs Icode and FACSAID. Once the results for each advert are gained they can be ranked according to presence of emotional stimuli. This allows a comparison later with the responses to discover whether a correlation exists.

Having examined the encoding stage using quantification methods, the new method approaches the decoding process from both a biofeedback and cognitive perspective. The methodology chosen to investigate audience responses (i.e. the decoding of the adverts) was adapted from several practitioners in the study of emotions (Peper and Karcher, 2001; Gendolla, 2001; Hess and Blairy, 2001; Bradley and Lang, 2000). Biofeedback is commonly used to test emotional responses to advertising so this procedure was based on other studies including Marci, 2006 and Hazlett and Hazlett, 1999. As emotional responses are relative to the individual, in this method there is a two minute pretest of each subject's baseline heart-

rate, skin conductance level and facial EMG response level (Rickard, 2004). As emotion is a two-stage process of biology and cognition, a second method, self-report, allowed known emotional responses to be measured. Feeltrace (Douglas-Cowie et al, 2000) measures known emotional responses to adverts. It is a program written specifically for the measurement of emotional responses to audio-visual texts and has the benefit of having a training programme built in, of measuring emotions in real-time, of being able to record both the type of emotional arousal and its intensity and of limiting the amount of words on the screen thus avoiding some of the problems of an entirely verbal measurement method. When all of the results are in for the independent (emotion-eliciting stimuli) and dependent variables (biofeedback and self-report responses) the two can be tested for connections using Statistical Package for Social Science (SPSS).

Emotional responses are subject to many factors beyond an advert so this new method incorporates the measurement of key variables which could alter the responses, including mood (Matthews et al, 1990), psychological type (Eysenck et al, 1975) and handedness (Oldfield, 1971).

6) The results of an attempt to use this method to analyse the emotional responses of a sample of viewers to a selection of place advertisements

Chapter Six reports the results of this method of testing for hedonic emotions in response to exposure to place adverts.

The first results are from the interviews which reveal some awareness of emotion by place marketers and a general sense that a positive or hedonic response is the desired one. This allowed a hypothesis to be formed that the place adverts were intending to elicit a hedonic effect in the audience. Having identified the expected emotion, a coding schedule was devised which included the criteria of voice, music and face which indicate hedonic

emotional expression. The place adverts were then ranked by the presence of these emotional stimuli. The results show that although varied, in general the adverts contain the expected hedonic stimuli. However, compared to the results of the biofeedback and self-report responses, there was very little correlation between them. With few exceptions, the correlations between the amount of hedonic stimuli in the adverts and the responses of the viewers were not significant.

The thesis concludes with a discussion of the success and weaknesses of this testing method. It suggests that its strengths include its encoding-decoding perspectives and the way three key stimuli which can affect the individual on a precognitive basis are identified and a quantification system established. Its weaknesses include the lack of significant correlation between the content and responses suggesting that there are other variables affecting emotion which are unaccounted for. The method may only ever form part of a way of studying emotional content as it is limited in the stimuli it assesses. Furthermore, its application is limited to assessing one emotion at a time and it is debatable whether this method can be transferred to more complex emotions.

CHAPTER ONE

A Discussion of Theoretical Perspectives on and a Working Definition of Emotion

This chapter reviews research on human emotions and makes a case for adopting both a cognitive and a physiological perspective. It argues for the primacy of a biological response to some stimuli, provides a working definition of emotion for the purposes of the present study and argues for the use of archetypal emotions when testing for the content and effects of adverts.

The nature of 'emotion' is a topic of considerable debate. Thompson (1988) discovered over a hundred theories of human emotion. A lack of agreement is one of the problems of studying the subject, as Nielsen and Kaszniak have pointed out: 'There is no consensus among emotion theorists on the proper definition of emotion' (2007: 362). Many, like George Mailler (1975), believe that, 'an attempt to define emotion is obviously misplaced and doomed to failure' (cited in Carlson and Hatfield, 1992: 5). Duffy (1941) would agree with such sentiments believing that, 'emotion, as a scientific concept is worse than useless' (cited in Strongman, 1977: 21). Such negative comments reflect the difficulty of the concept. However real its impact, an emotion is an abstract rather than a concrete concept which cannot be divorced from our thought patterns or physical responses as, 'our entire consciousness of the world and this includes our consciousness of ourselves is suffused with emotion' (Cornelius, 1996: 3).

Reflecting this difficulty, the Oxford English Dictionary's definition of, 'mental feeling or affection distinct from cognition or volition' is flawed in two ways. Firstly, it requires a definition of 'feeling' which is often seen as being the same as emotion – 'Emotion is feeling' (Strongman, 1987: 1). Secondly, it presumes emotion to be divorced from cognition and action when it may be seen to be integral to both. Not only is the concept of

emotion difficult to define, there seem to be different types; anxiety, for example, can be a personality trait or a state. As well as trait and state emotions, there are complementing emotions - for example, art can cause a response of joy and responding emotions such as admiration for the quality of the art (Frijda, 1993). Finally, emotion may be seen as a process rather than a state and theorists sometimes take a part of this process and consider this to be the emotion.

Understandably, the concept of emotion has baffled and perplexed many theorists and an all-encompassing definition has been hard to find. Often the definitions only explain part of the concept, as Scherer has noted: 'Reading through the definitions…one is forced to admit that none of them sounds entirely wrong' (1987: 3). However, we do label emotions and give ourselves words for physical and cognitive responses and there is a shared agreement about the nature of these experiences. Louis Meyer, quoting Shakespeare's A Midsummer Night's Dream, suggests that our need to give, 'airy nothing a...name' can be explained by the fact that 'nameless phenomena are highly disturbing' (Meyer, 2001: 343).

The difficulties of definition of emotion have been made more complex by the range of sometimes conflicting schools of thought that have influenced those who have chosen to study the subject. As Cornelius stated: 'The definition of emotion offered by any one psychologist who studies emotion reflects the particular interest of the psychologist as well as his or her methodological and theoretical predilections and the theoretical tradition and explanatory paradigm' (1996: 9). Rottenberg et al argue that: 'With different investigators employing their own idiosyncratic and often widely discrepant definitions of emotion, it is no wonder that there has been considerable confusion as to which procedures reliably elicit emotion' (2007: 10).

This study concentrates on two schools of thought on the subject – the broadly-termed physiological and cognitive schools. In this chapter there is an explanation of this choice, starting with (1.1) the physiological school which sees emotion as a chemical process

affecting the body then (1.2) the cognitive school which sees emotion as a conscious appraisal of phenomena and (1.3) a growing consensus that emotion is a physiological-cognitive process. After this, there is (1.4) a discussion of which of the processes, physiological or cognitive comes first. Having established an argument for adopting a two-component physiological-cognitive approach, there is (1.5) an acknowledgement of other approaches to the subject which leads to (1.6) a working definition of emotion and finally, (1.7) which emotions can be studied in an empirical manner.

1.1 Physiological school

Those who belong to the broadly termed physiological school consider emotions to be innate and, therefore, universal, and needing, 'no cortical mediation' (Peretz, 2001: p.118). Scientists who can be collected together into this physiological approach believe emotion to be largely the result of evolution and emotion to be a natural physiological response to a stimulus-event. As such, these responses are, 'outside of awareness (and)…unavailable to volitional modification' (Scherer, 1987: p.11). One of the earliest and perhaps the most influential scientific study into the subject was by Charles Darwin (1809-1882) who believed that facial muscles had been created for emotional expression and observed how emotional expression was cross-cultural, confirming his belief in a common origin of the human species[1]. Charles Bell's (1824) *The Anatomy and Philosophy of Expression* and Antoinelle Feleky's (1914) *The Expression of the Emotions* continued to develop Darwin's ideas.

[1] While scientific research into emotions may be traced to this date Carlson and Hatfield writing in 1992 noted how in their field of psychology: 'Only with the past 15 or 20 years or so have modern-day psychologists begun to propose relatively comprehensive theories of emotion and conduct the research necessary to test these ideas.' (Carlson and Hatfield, 1992: ix).

While Darwin, Bell and Feleky were observing the externals of emotion, William James[2] (1842-1910) tried to understand the internals of our evolutionary heritage. Much in the same way as Galen (c129-216) had surmised 1700 years earlier, James thought that the source of emotion was in the visceral system. Emotions were instinctive, to James, a biological response by the internal organs which produces emotion. As he wrote, we perceive an object/event we see as emotional then, ' the bodily changes follow directly the perception of the eliciting fact and that our feelings of the same changes as they occur is the emotion' (James, 1892, cited in Thompson, 1988: 266). These physiological changes are the emotion as perceived by the individual. This is not to say that cognition does not occur but without physiological responses, these cognitions would just be bland thoughts, as James puts it: 'Without the bodily states following on the perceptions, the latter would be purely cognitive in form, pale, colorless, destitute of emotional warmth' (James, 1892, cited in Thompson, 1988: 266). Carl Lange (1834-1900) had a similar theory but concentrated on the cardiovascular system. Behind both theorists' research is a belief in physiology first – that emotions are a bodily response devoid of cognitive processes. However, the so-called James-Lange approach (they did not wholly agree but are often placed together because of broad similarities (Thompson, 1988)) alone is too simplistic to explain emotion and, 'time has not been charitable to the James-Lange approach' (Cotton (1981) cited in Cornelius, 1996: 78). Early experimenters thought that the physiological response was simple. Hess (1935), for example, believed that all biological responses are the same – all cats arch their back so all humans also have a pre-programmed response mechanism: anger, for example, coincides with the production of adrenaline, fists clench etc.. However, experiments conducted by those such as Cannon (1927) (which showed that cutting the nerves to the internal organs does not eliminate emotions (Thompson, 1988)) have shown the importance of the brain in

[2] LeDoux (1999: 43) attributes James's paper in the journal Mind titled, What is Emotion? as the start of academic study of the phenomena.

emotion. Other experiments have shown that if the visceral system is partly dislocated then emotional responses are weaker (Hohman, 1966; Blascovitch et al, 1983).

Over the years, biologists have noted an increasingly complex biological process that produces or responds to emotion. James argued for its visceral location, Lange its vascular location, Cannon located it in the brain. Other scientists have added skin, somatic muscles and hormonal excretors. Cannon's view that the brain is the main source of emotion which signals changes in the body is perhaps the most persuasive as studies on patients with lesions in the amygdala do not show some of the bodily responses to emotional stimuli such as changes in skin conductance (Becheral et al, 1999, cited in Zalla et al, 2000: 1764). In particular, the thalamus, especially the hypothalamus seems to be where, 'the patterns of expressive emotions are elaborated' (Ekman and Scherer, 1984: 15). Figure One shows the pattern of stimuli from receptor to the emotional hub, the thalamus which releases chemicals to the body and informs the cognitive part of the brain the route taken by emotion through the brain showing how the release of chemicals to the cerebral cortex and visceral system occurs before there is cognitive feedback

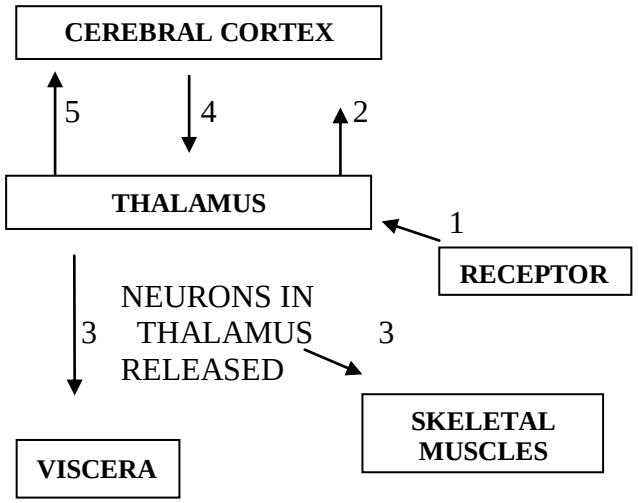

Figure One: Cannon's model of emotional response

The hypothalamus and surrounding limbic system appear to be the seat of emotions such as fear, anger, desire, dejection, depression, ecstasy and affection. This connects well with the list of basic emotions agreed by many taking the physiological approach to the study of emotion. The brain is part of the Central Nervous System (CNS) which acts with the Peripheral Nervous System (PNS). Part of the PNS is the Autonomic Nervous System (ANS) also known as the visceral nervous system which includes organs which operate outside of consciousness. The head ganglion (main collection of nerves) stimulates all or some of the ANS (dependent on whether the stimulus activates the Sympathetic or Parasympathetic system, the latter being more selective while triggering the former is thought to aid the fight-or-flight response necessary for survival). Unfortunately, the 'visceral afferent system is little understood' (Carlson and Hatfield, 1992: 113) except the face, where it is observable.

This observable aspect of the ANS is one that can be more easily measured. Following on from James-Lange perspective Floyd Allport (1924) was of the view that 'awareness of one's facial expression is the emotion' (summarised by Lanzetta (1976), cited in Cornelius, 1996: 367). While this may be too simplistic, experiments confirm that the face is an important indicator and cause of emotion. Laird[3] (1974) and Strack et al[4] (1988), for example, have undertaken experiments to confirm this. While their results were conclusive about the importance of facial feedback there are criticisms of such experiments. Winton (1990) notes that it is debatable whether the subject got the expression 'right' and points out that there are many intervening variables such as the pleasure of doing an experiment and the pain of holding one expression for so long which may affect the results. Furthermore, from such experiments there have been different conclusions (cf., Ellsworth et al (1979)). Nevertheless, Carlson and Hatfield stated that this is one theory with a wide agreement:

[3] Based on self-report measures, Laird (1974) tested whether holding sad and happy expressions led to commensurate feelings.

[4] Strack et al (1988) studied the responses to cartoons to see if they were assessed more positively if the subjects mimicked a smiling expression by keeping a pen in their mouths.

'Most theorists agree that our emotions are influenced to some extent by facial feedback' (1992: 199)[5].

Underpinning the brain and ANS are the neurohormones which work through each. In the search for the biological origins and pathways of emotion there have been 'great strides' in the scientific fields in recent years largely through genetic research but to this day, 'researchers who tried to tease out the neural foundations of emotion ended in a tangle of confusion' (Carlson and Hatfield, 1992: 121). Frijda concurs with this stating that, 'the mode of operation of most neurohormonal factors upon mood and 'feeling' is unclear and open to various interpretations' (1991: 398). This is part of the intellectual full stop making emotions still a mystery, a sentiment backed up by Carlson and Hatfield: 'Today, the neurosciences still know very little about the nature of consciousness, subjective experience or emotional feelings' (1992: 124).

That said, the physiological approach has been vital in establishing the origin and pathway of some emotions. It highlights the view that emotion is a physiological response – the bodily changes which accompany cognition of an event/stimulus are what the brain receives as 'emotion'. Physiological studies of the brain have also given further credence to Darwin's evolutionary theories showing how the brain appears to be triune – created in three stages – Protoreptillian, Protomammalian and Neomammalian. The Protoreptillian part of the brain was formed during the earliest stage of human evolution, containing the drives for food, shelter, defence and reproduction. This part contains the head ganglion – the main neural pathway to the physiological system. It may be here that our 'fight-or-flight' response originates and the most basic emotions of pleasure and pain. It is in this part of the brain that the emotional centres of the brain including the nucleus accumbens, amygdala and

[5] One useful extension to this area has been the experiments on children which have been useful in suggesting an evolutionary basis for emotions. Steven (1979) observed that all babies responded to sweet tastes by smiling and sour by lip pursing. In addition, Plutchik notes, 'infants can produce almost all of the discrete facial movements that adults produce' (1994: 174) - even when born blind and deaf. This suggests that we have evolved with a face that instinctively communicates and arguably feeds back emotion.

hypothalamus rest: 'these subcortical structures evolved early and may carry out limited operations that are essentially preconscious' (Winkielman and Berridge, 2004: 120).

It may be argued that the physiological approach does not take into account the full complexity of emotions perhaps concentrating too much on the responses generated in the Protoreptillian part of the brain at the expense of the mammalian parts where emotional impulses are regulated. Those that see emotion as a biological response tend to confine their studies to the exploration of a few emotions. This echoes the very early belief of Spinoza (1632-1677) who claimed that there were only three emotions and everything else was a mix of these - for example, 'love is nothing but joy, accompanied by an external cause' (cited in Plutchik, 1994: 54). Even Darwin in the Expression of Emotions in Man and Animals (1872) did not claim to know how many emotions there were although he mentioned seven (Plutchik, 1994). Another weakness of some involved in tracing emotion to a physiological response is that they do not take into account biological variability in humans, having 'the simplistic and erroneous assumption that because all humans are similar anatomically, they are similar physiologically' (Thompson, 1988: 330). Age, sex, and race vary us, as well as genetic variability and biological factors caused by diet, the menstrual cycle etc. The James-Lange approach is still popular today, albeit in the Neojamesian guise. Although such theorists as Tomkins (1962), Izard (1971) and Leventhal (1979) concur with James that, 'the pattern of autonomic and somatic arousal *is* the emotion' (Thompson, 1988: 276), to physiological arousal ('which is 'paramount' - Thompson, 1988: p.276) they add cognitive factors.

1.2 Cognitive school

The cognitive approach has 'become one of the most dominant approaches to social psychology' (Argyle, 1991: 161) and as such, according to Carlson and Hatfield (1992) has

dominated the recent history of the study of emotion. Cornelius (1996) links this to a zeitgeist change in academic research which grew in the 1960s (Oatley and Jenkins, 1996)[6]. Despite the claim that 'cognitive science is really a science of only part of the mind, the part having to do with thinking, reasoning, and intellect. It leaves emotion out' (LeDoux, 1999: 25), in the absence of a convincing and complete neurological model members of the cognitivist school of social psychology have attempted to explain emotion in terms of cognition. Cognitivists concentrate on the role of appraisal or evaluation believing that it is the interpretation of physiological experience that labels and defines emotion. Emotion is linked to semantic (cf., Suci and Tannenbaum, 1955; Wickens, 1972) and schematic (cf., Clark and Fiske, 1982) processing. The object or stimuli triggers patterned psychological processes and these include emotion.

Cognitive social psychologists interested in the study of emotions have conducted experiments exploring the ways emotions can be manipulated. Schacter and Singer (1962), for example, believed that the only biological response to emotion was the suppression or release of epinephrine (adrenaline). They injected subjects with the chemical – some had been told that it was epinephrine and of its effects (Informed), some had not been told of its effects (Ignorant) while others were Misinformed of the likely response. The subjects were put into a room designed to make them angry (a questionnaire had to be filled in which included such questions as how many times the subject had sex in a week and a final question of how many sexual partners the subject's mother had – 4 being the lowest option). They were accompanied by an actor who responded angrily to the questionnaire. Others were sent to a 'euphoric' room where an actor played with the paper and generally 'made merry' of the enjoyable activities given. The subjects generally responded accordingly, especially the Misinformed and the Ignorant – those in the angry room who interpreted the adrenaline as

[6] LeDoux suggested that this grew to such a level that, 'By 1980, the cognitive approach to emotion was just about the only approach' (1999: 53).

anger while those in the euphoric room interpreted their bodily sensation as happiness - leaving the experimenters to conclude that adrenaline is the bodily response and the individual decides why s/he has received this trigger according to circumstance.

Dutton and Aron's (1974) experiment adds further credence to the cognitive approach providing strong evidence for the role of appraisal in interpreting emotions. They placed a female researcher on two bridges – a high one on a swaying 450 foot long suspension bridge 230 foot above Capilano Canyon and a low one 10 feet above a stream. On both bridges the researcher asked males to recall a story which were tested for sexual imagery. The high bridge stories contained much more of this imagery than those offered by participants on the low bridge. The researcher also gave the men a contact phone number to use to find out the results of the experiment. 9 out of 18 males on the high bridge contacted the researcher while only 2 out of 16 did on the low bridge (Dutton and Aron, 1974: 512) leading to the conclusion that circumstance helps to control the interpretation of the event and therefore the emotional response. In this case, the fear of being on the high bridge was interpreted as sexual arousal.

These experiments demonstrate the importance of cognition on emotion. They show that biological responses are interpreted by the individual and this can help determine which emotion is experienced. However, critics of such experiments (cf., Plutchick, 1994; Leventhal, 1974) comment on the way adrenaline is presumed to be the chemical determining mood. Marshall and Zimbardo (1979) make the withering statement: 'it is somewhat reassuring, especially considering the possible adaptive significance, that our true emotions may be more rationally determined and less susceptible to transient or whimsical situational determinants that has been suggested by Schacter and Singer' (cited in Cornelius, 1996: 87). Another weakness is the undifferentiated way some cognitive theorists (cf., Mandler, 1975) saw the ANS operating. As Cornelius (1996) notes, there is no biological backup to such studies. Schacter and Singer's 1984 study starts and stops with the term 'physiological

arousal' as an explanation of the biological responses in their subjects. This over-simplification makes their findings 'extremely flawed' (Cornelius, 1996: 79). The full complexity of emotions might look more like the model in Figure Two factors with that predispose emotion affecting which areas of the limbic system are employed along with behaviours and hormonal responses which correspond to them (adapted from Henry, 1986, cited in Carlson and Hatfield, 1992: 328)

.

Foresight
Language analysis
Visio-spatial synthesis
Logic
Insight

↓

Decided emotion	serenity	anger	elation	fear	depression
Limbic system activation	amygdala	amygdala central nucleus	hippocampus basal nucleus	amygdala septum	hippocampus
Behaviour	meditation	fight	bonding	flight	loss of control
Some Hormonal Responses **↓ down** **↑ up**	NOR EPI↓ EPI↓ PULSE↓	BP↑ PULSE↑ NOR EPI↑ TESTOSTERONE↑	ACTH↓ CORTISOL↓ ENDORPHIN↑ TESTOSTERONE↓ CORTISOLE↑	BP↑ PULSE↑ NOREPI↑ EPI↑ TESTOSTERONE↑	PULSE↑ ACTH↑ ENDORPHIN↓

Figure Two: model of emotional response showing predispotisions and chemical changes

1.3 Physiological-cognitive agreement

There is a growing consensus about emotion being a two-component process of both biological and cognitive responses. It is useful here to borrow Leventhal's (1974) terms of 'cold' (non-emotional) and 'hot' (emotional) systems to explain how physiological and cognitive responses work in tandem. The cold system operates when the stimulus-representation calls for a mechanical response. For example, a puddle of water elicits a cold response as it is planned to be stepped over, executed, and then appraised to see if wet. A puddle of blood, however would trigger the hot system – facial responses, feelings of disgust and fear. The puddle must still be overcome so both systems can work at once,

'simultaneously evaluat(ing)...external and internal stimuli at an unconscious level' (Thompson, 1988: 301). Leventhal also identified three stages of appraisal: the 'stimulus-representation' stage is partly governed by schemata (perceptual motor codes) which are memories, triggered by sights, sounds, smells etc acting as 'situational cues' (Thompson, 1988: 301) which elicit, 'specific emotions and specific motor programs' (Thompson, 1988: 301) then the 'planning-execution' and 'appraisal' stages help to deal with the stimuli and allow learning for any future involvement with it.

Oatley and Johnson-Laird (1987) also work from a physiological-cognitive standpoint, believing there to be a limited number of basic ANS responses – happy, sad, anxiety, fear, anger and disgust which are biological instantaneous reactions. Later, the cognitive processes take over and modify these initial responses adding to their complexity. Cardland's (1977) continuous emotional feedback (see Figure Three) model demonstrates this idea and argued against a temporal sequence believing that physiological response, cognitive appraisal and emotional experience all happened simultaneously, feeding off and being altered by each other.

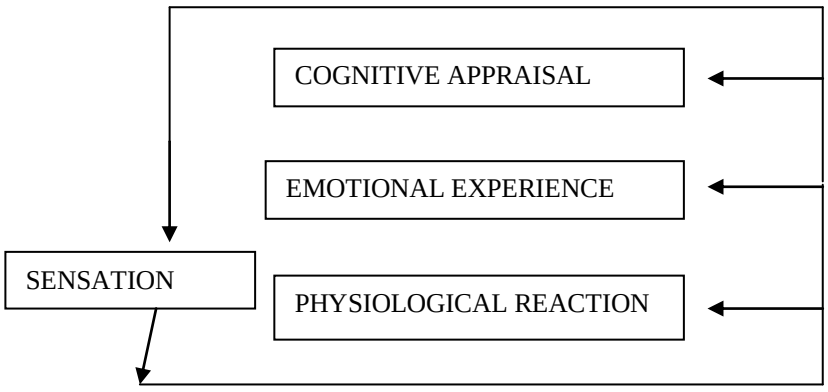

Figure Three: Cardland's 1977 diagram which shows how emotion is the result of continuous feedback

While the physiological school tends to concentrate on few emotions, seeing an evolutionary basis to them Cognitivists have attempted to explain more complex emotions such as 'pride'.

While those in the cognitive school accept the physiological component of emotion they argue that it only becomes manifest when the individual can label it.

1.4 The primacy of biological responses

While there is a growing consensus that emotion is a two-component process the primacy issue still remains – which comes first, the biology or the appraisal? For Lazarus (1991) there are three appraisal stages – firstly, one which considers what the person feels (subjective); secondly, one which assesses bodily responses (physiological) and thirdly, where the person assesses what to do (action). Therefore, he puts biology second. Heidler (1980) argues that there is first a physiological response from a stimulus followed by appraisal stages: primary which considers the consequences for well-being; secondary where actions are decided and re-appraisal for future reference. Therefore, biology for Heidler is primary. Cardland (1977) argues for the simultaneous nature of biological and cognitive experience. A gestaltian idea of memory whereby stimuli are packaged helps to explain how emotion may be simultaneously a biological and cognitive response as emotion is part of the gestalt (DuPlessis, 2005: 64).

There is some agreement, that a biological response may precede a cognitive interpretation. Improvements in neuroscience technology have allowed the patterns of emotional response to be observed and mapped and they provide support for the primacy of biology. LeDoux's (1999) conclusions from his neurological studies that, 'any stimulus takes two paths through the brain. It goes into the amygdala which produces a response on an emotional…level, and it goes into the hippocampus where the content…is evaluated' (cited in DuPlessis, 2005: 63). Marci usefully sums up the four main lessons from neuroscience: '(1) the vast majority of emotional processing occurs below conscious awareness; (2) despite the importance of emotions, humans have limited ability to describe their emotional world;

(3) emotional and memory systems are dynamic and change moment-to-moment in response to the environmental context and (4) the emotional centers of the brain are connected to the cognitive centers of the brain and receive information prior to and influence cognitive processing and behaviors' (2006: 381). Marci demonstrates that neurological experiments have concluded that emotional processing mainly occurs beyond consciousness and that there is first a biological 'hit' that a stimulus gives the brain which leads to cognition.

This idea that emotion is a preconscious biological trigger is supported by Scherer's (1987) theory that an individual on encountering a stimulus puts it through a Stimulus Evaluation Check (SEC) to determine its value. Table One outlines his view of the sequencing of stimulus processing (Scherer, 1987). While it is unlikely that all emotional processing would follow the same route, the model suggests that biology is the prime responder and this informs the cognition. Before this, the Novelty Check occurs scanning the environment for new events/stimuli and their effect on the biological system. The individual is positioned towards or away from the stimulus-event dependent on the level of pleasure that can be gained or danger that must be avoided. Having been signaled as relevant, the cognitive processes take over: 'When a stimulus…is perceived as significant, an increase in physiological arousal results helps prepare the body for action' (Rickard, 2004: 372). This is not to say that cognitive thoughts cannot induce emotion nor that biology does not need cognition to 'make sense' but that when it comes to certain stimuli the evidence suggests that biology is triggered first.

1. Novelty Check– see whether there is a change in internal or external stimuli
CNS: alpha blocking; P300 component in evoked cortical potential
Endocrine: corticosteroid secretion
ANS: HR response; SCR responses; pupillary dilation
SNS: local tonus changes
Face: AUs 1, 2, 5 or 4, 7, 26, 38; gaze directed
Voice: interruption of phonation; fricative sounds
Body: Head raise, body straightener
2. Intrinsic Pleasantness– approach or avoidance tendencies based on innate feature detectors and learned associations
HR deceleration, glandular secretions
SNS: local tonus changes
Face: AUs 5, 26, 38, 12, 25
Voice: faucal and pharyngeal expansion, relaxation of tract walls, vocal tract shortened
Body centripetal hand and arm movements
3. Goal/Need Significance Check – evaluation of whether the stimuli obstructs or is conducive to the organism's goals or needs
4. Coping Potential Check– Evaluating the cause of the stimuli and the organisms power to affect and control it
5. Norm/Self Compatibility Check – social and personal conventions considered before a response is made.

Table One: description of Stages of Stimulus Evaluation Check and Component Patterning Theory predictions for stimuli (adapted from Scherer, 1987)

SECs are precognitive acts, an animal survival method in which the organism receives a stimulus which 'alerts' (Scherer, 1987: p.29) it to the event, during which time, CNS and SNS responses are put into action affecting the skin, heart-rate, and pupils and sending electrical signals to the vascular system. It is at this point, the assessment can happen. When an individual is in contact with a stimulus emotions are a powerful force in determining both attentioning and indicating emotional response. This concept puts more detail on the Jamesian idea that, 'emotion is a perception of bodily changes' (Winkielman and Berridge, 2004: 120) so the bodily changes come first and the cognitive perception interprets. These responses are, 'non-negotiable' and force our attention onto the eliciting stimulus until the action tendency is realised' (Sloboda and Juslin, 2001: 88). In LeDoux's terms, emotional information has a 'quick and dirty' (cited in Kindt et al, 1996: 653) route that is 'automatic

and crude' (Kindt et al, 1996: 653) and sends emotionally affecting stimuli on a different route to neural information.

This idea has been given more credence by experiments which mask stimuli (cf., Wilson and Zajonc (1980); Ohman and Soares (1994)) so that the brain is given a stimulus for less than 50ms which is considered beyond cognition (subliminal) meaning any bodily responses that occur must be precognitive. This 'affective primacy hypothesis', suggested by Zajonc (1980) claims that, 'affective stimulus properties are rapidly processed and can exert global effects on judgment and behavior without the intervention of cognitive inferences or conscious awareness' (cited in Nielsen and Kaszniak, 2007: p.368). Gordon added: 'It is now widely accepted by scientists involved in studying the brain that most mental functioning operates unconsciously and that our consciousness is of very little importance in our mental life' (2006: 5-6).

There is understandable debate as to whether the preconscious biological responses (biofeedback) are actually 'emotion' – some giving the term 'proto-emotion' (Sloboda and Juslin, 2001: p.97) arguing that it only becomes emotion when it is cognitively processed. Another problem with the idea of biological primacy is that the biological response to emotion is still uncharted and in the place of the ability to fully track the neurological pathways, theorists can only debate the nature of these initial chemical responses[7]. While it might be seen that the 'vast bulk' (Gordon, 2006: 6) of information is processed unconsciously it could be argued that what is important to the organism in real terms is what is felt and thought cognitively.

[7] One idea is that the animal response to these SECs is an aversive-appetitive one. This means that the organism will look for appetitive and stray away from aversive stimuli. In addition 'emotionally significant stimuli might also reflexively capture the organism's attention and facilitate the processing of these cues' (Schupp et al, 2003: 7).

1.5 Other schools

Having established two of the main schools of thought on emotion as being physiological and cognitive and made an argument for the primacy of a biological response, this section acknowledges other schools of thought on the subject. Hargreaves noted that, 'the days of 'grand' all-embracing theories in psychology have long since gone, such that there is now much more common agreement about the proper concerns and boundaries of the subject there is nevertheless a considerable diversity of modes of explanation' (1992: 10). While there is still this diversity there is a growing common agreement about the subject of emotion which acknowledges the contributions of many of these schools of thought: social constructivist, psychodynamic, behviourist and motivational.

The work of social constructivists for example, clearly shows the effect of culture on collective cognitive emotional responses. To a social constructivist there are an indefinite amount of emotions (Cornelius, 1996) because the society prescribes which subjects are important then gives them words. The body of research into different cultures is useful and has been extended to study the way governments might use emotion for their own ends in the work of such theorists as Elias (1939) who traced western civilisation and how it depended on the control of emotion. Frijda explains: 'Elias convincingly shows how (emotional) acts and experiences…were progressively 'civilised', suppressed and 'channelized'' (Frijda, 1993: 413). As well as the general control of emotion over the years, different societies whether communist or capitalist can use the emotions of shame and guilt to impose attitudes and actions on the workforce. This research is very useful to explain how emotion is partially controllable by forces external to the individual and how culture will help determine them. It also helps us to understand their changing nature but, as Frijda notes: 'social dynamics and ideologies do not influence emotion or control emotion directly' (Frijda, 1993: p.413). In other words, they should be seen as part of the bigger picture which helps to form cognition

and should be acknowledged in this context – not as the all-encompassing controller of emotion.

There are also Psychodynamic approaches to emotion but assessing the work of Freud (1856-1939) and Jung (1875-1961) in 1964, Rapaport concluded that the 'Freudian concept of emotion is unclear' (Strongman, 1987: 30). The basic premise of Freud is that our conscious emotions come from our un and sub consciousness. They become distorted in translation being reformulated to a version we can accept. In particular, Freud was concerned with few and generally negative emotions such as anxiety and envy. To Freud emotions such as anxiety were the result of repressed thoughts and desires that the subconscious would not allow through to the conscious in order to protect the individual so it manifests in this form. There are two reasons why it might be wise not to get sidetracked by Freud. One is the under-studied nature of his assertions (who could scientifically study it? Especially as, 'many of Freud's concepts…are simply untestable' (Thompson, 1988: 292)) and the other is the limited range of emotions with which he is concerned - happiness, for example, does not feature very highly. Furthermore, Freud's huge outpourings over the years 'frequently negated earlier theories' (Thompson, 1988: 283). If Freud was right and conscious emotions are merely versions of the 'real thing' (Carlson and Hatfield, p.35) then only dreams and hypnotism could decipher them. Nevertheless, his essay, 'Instincts and their Vicissitudes (1915) did further the study of emotion and widened the debate and his idea that Instinctual (affective) energy changes the Object (idea) (Clore and Parrott, 1991: 107) is a useful attempt to understand the cognition of emotion. Jung may have further insights into emotions with his assertion that people have a collective unconscious[8] of symbols, images and the species' history. These 'archetypes' which include death, god, power, fire, animal etc. have been passed down from our earliest ancestors and include some of our basic predispositions to

[8] Here it is worthwhile commenting on the Freudian nature of unconsciousness and that referred to in this study. LeDoux (1999) helpfully terms the Freudian unconsciousness as 'dynamic' (p.30) implying unknowable unsourced, powerful forces and the 'cognitive unconscious' which is 'tamer' (p.30) ways of automatically computing phenomena that do not involve higher order processes.

emotions. Other evidence is difficult to find with Jung and research into the brain is not advanced enough to prove or disprove his theory. We are left with his output of beliefs: thinking and feeling are equally important; conscious and physiological responses give rise to emotion; everything about the personality is shaped by feeling. Emotion was certainly crucial to Jung but there is little that can be used by empirical study into emotion.

The Behaviourist school see emotions as desires that could be manipulated by the surrounding environment. There is an agreement with the James-Lange view that emotion is a hereditary 'pattern reaction' (Watson (1929) cited in Strongman, 1987: 18) which involves the brain and body but added to this the work of Pavlov and his theory of conditional reflexes (Thompson, 1988). To a behaviourist such as Watson, 'emotional behaviours *are* the emotion' (Thompson, 1988: 270) and these learned behaviours included autonomous responses, movements and verbalizations (Thompson, 1988). Innate emotions such as fear, rage and love/lust was modified by an individual's surrounding environment to become a Controlled Emotional Response (CER). Skinner (1904-1990) believed that emotions were human activities rather than causes; they were done rather than received. Skinner was attempting to model psychology on the natural sciences with laws that predicted how humans would behave in different conditions. These ideas have been adapted into a more cognitive interpretation respecting the subjectivity of the subject and acknowledging that three innate emotions may be too limited, recognising that the love/lust emotion is not seen in children until 5/6 years old (Thompson, 1988). The approach is limited by an inability to explain emotions that are harmful to the individual, such as intense jealousy nor more complex emotions such as the pleasure we might feel for someone else's success. The behaviourist approach has given us the important knowledge that, as Solomon (1978) noted, emotions are, to an extent, the 'outcome of choices' (cited in Frijda, 1991: 401) as we learn to control or regulate natural feelings until, 'all normal emotional response is dampened, graded and monitored' (Frijda, 1991: 401).

The Motivational approach to emotion views emotion as the end result of goals (Rolls, 2005). This can be a rewarding positive state if they are achieved or a punishing negative state if they are not. There is a psychoevolutionary basis to this approach (cf., Plutchik, 1980) stating that emotions are the result of human adaptation and that there is a purpose to them. So, fear is needed if humans were to avoid danger, wonder if they were to explore their surroundings, loneliness to encourage socialisation. The positive evolutionary goals have, it suggested, created the necessary feelings and from here the individual sets life goals and the reward-punishment functions are activated. As with other approaches this arguably simplistic view of emotions has declined in popularity as motives emerged without corresponding biological need (Reeve, 2009). Also, behaviour is moderated and sometimes caused by more than internal motivation - social pressure, for example, can also cause behaviour. Added to this there are moods fleeting and unexplained caused by among other factors neurohormonal internal changes. As Reeve explains: 'As motivation study progressed and as new findings emerged, it became clear that if progress was to be made, the field was going to have to step outside the boundaries of its grand theories' (Reeve, 2009: 33). The approach did, though, highlight some of the origins and causes of emotions.

There are, then, many ways of viewing emotion and each perspective enlightens. The definition of emotion adopted for this study acknowledges the complexity of the subject but stresses the importance of biology and cognition as its two central processes.

1.6 Integrated definition of emotion using theory from different schools.

Having outlined some of the major schools of thought on emotion and shown a preference for those who see emotion as a physiological-cognitive process with biological primacy it is possible to give a definition of the subject. Frijda noted that, 'any study must begin by defining the subject of investigation. One must know and let be known what one is

talking about (but)...in the case of emotion this is a difficult matter. The phenomena to which the label 'emotion' or 'emotional' is attached appears to be diverse' (Frijda, 1993: 1).

Plutchik (1994) and Kleinginna and Kleinginna (1981) and Rottenberg (2007) have attempted integrated definitions using the major fields of study:

'emotions are triggered by an interpretation of events, that they involve strong reactions of most, if not all, of our bodily systems, that they can be disruptive of ongoing activity, and yet somehow adaptive. Emotion communicates information from one person to another and they may express different feeling states. They may have something to do with survival of the individual and the species…emotion may even have something to do with influencing or regulating the relations between people' (Plutchik, 1994: 5)

'Emotion is a complex set of interactions among subjective and objective factors mediated by hormonal systems which can (a) give rise to affective experiences such as feelings of arousal, pleasure/displeasure, (b) generate cognitive processes such as emotionally relevant perceptional effects (c) activate widespread physiological adjustments to the arousing conditions, and (d) lead to behaviour that is often, but not always expressive, goal-directed and adaptive' (Kleinginna and Kleinginna cited in Plutchik, 1994: 5)

Added to these is Rottenberg et al's:

'a transient but coordinated set of responses that occur when an individual faces a situation (real, or imagined) that is relevant to salient personal goals…typically involving changes in cognitive, experiential, central physiological, peripheral physiological, and behavioral response systems' (2007: 10)

Table Two shows how these definitions incorporate some of the major thinking on emotions. They also illustrate how the area is becoming increasingly integrated and finding common ground within which to work.

Tradition	Plutchik	Rottenberg	Kleinginna
Cognitive	Interpretation of events	Changes in cognitive response systems	Generate cognitive processes
Behaviourist	Regulates the relations between people	Changes in behavioral response systems	Interactions among objective factors
Physiological	Survival of species Strong reactions of bodily system Adaptive	Changes in central physiological systems	Leads to behaviour that is adaptive Activates widespread physiological conditions
Motivational	Disruptive of ongoing activity	Individual faces a situation relevant to salient personal goals	Leads to goal-directed behaviour

Table hwo: How the definitions by Plutchik, Rottenberg and Kleinginna and Kleinginna incorporate four of the main approaches to the study of emotions.

However general, open-ended and imprecise these three definitions are, they do acknowledge the main perspectives on emotional study. This connects with Cornelius's view that: 'I see no reason why future students of emotion can't draw liberally from all four perspectives' (Cornelius, 1996: 213). Critics of this approach might argue that to place contrasting views of emotion into one all-encompassing definition can only be achieved by watering them down and denying that the traditions are conflicting. From a cognitive view, emotions are thoughts and evaluations, from a physiological view they are biological reactions while a behaviourist sees emotions as actions. One emotion cannot be both an instinctive biological reaction and the result of processing the reaction in order to understand it. In addition, these all-encompassing definitions do not include the Freudian perspective that emotions are unknowable except through methods delving into the subconscious or social constructivist views that they are socially made and controlled. Perhaps Frijda's belief that, 'a definition of emotion can only be a product of theory' (Frijda, 1993: 1) should be accepted. However, these definitions are a start, away from the pendulum-swing of prevailing research trends and towards an understanding of the subject. In addition, they recognise that

many of the theories are commensurate in the sense that each school of thought has produced a partial explanation of emotion that is not necessarily contradictory with another school's ideas. As Juslin and Sloboda explain: 'emotions do not constitute a homogenous class. For instance, some, such as disgust, might be primitive, automatic responses that are not susceptible in their operation to changes in the subject's cognitive state, whereas others, such as patriotism, are marked more by their self-conscious intellectual content than their sensational character' (2001: 27).

There are positive signs in the academic community that there is a 'slowly developing consensus' (Forgas, 1991: 5) as, 'affective scientists have increasingly moved towards a consensual understanding of key affective processes' (Rottenberg, 2007: 10). This has happened over time, as Forgas explained, 'as the accumulation of empirical information reached a 'critical mass' in a variety of fields, a slow but inexorable convergence and integration of theories has become apparent in recent years' (1991: 7).

1.7 Emotions that can be studied in an empirical manner

Having established a theoretical standpoint on the subject of emotion and a working definition of the term this section discusses the issue of definitions of separate emotions and concludes that when testing for emotion in an empirical manner it is advisable to isolate the seven archetypal emotions.

One reason for testing for 'archetypal' emotions is because 'a good deal is known about…archetypal emotions' (Cowie et al, 2001: 52). Despite the many differences in approach or belief, theorists cite happy, sad, fear, anger, surprise, disgust, boredom and anger or their synonyms as basic, innate and therefore universal emotions. This takes a Universalist approach to the subject. Universalists (cf., Ekman 1989; Brown 1991; Schwartz 1992) believe that fundamental emotions occur in all humans while Relativists (cf., Harre 1986,

Heeles 1986 and Lutz, 1988) see them as culturally exclusive. Genetic research has produced arguments in favour of Universalists. The decoding of deoxyribonucleic acid (DNA) has determined that humans share 98.2% of our DNA with chimpanzees (cf., Leakey, 1994). If emotions are universal they are passed through our DNA and if humans share so much with chimpanzees then these emotions should be observable in them also. Hebb in 1945 and Goodall in 1986 agree that basic human emotions can be observed in these animals and that humans can recognise their expressions.

Research (cf., Izard, 1980 and Ekman, 1973) has shown that such patterns exist cross-culturally - 'across cultures, humans display response stereotypy during emotional states' (Thompson, 1988: 336). In particular, four emotions: fear, anger, happiness and sadness are characterised by patterns of autonomic activity which can be observed (Thompson, 1988). Furthermore, six emotions can be characterised by distinct facial muscle patterns: anger, disgust, fear, happiness, sadness and surprise (Thompson, 1988). In choosing the emotional response(s) it is important to identify those that can be measured. Table Three establishes some agreement over the types of archetypal emotions and especially the inclusion of happiness.

Theorist(s)	Date	Amount	Details
James	1892	8	Anger, fear, grief, love, hate, joy, shame, pride
McDougall	1926	7	Anger, fear, disgust, elation, subjection, tender, wonder
Watson	1929	3	Fear, rage and love
Arnold	1960	11	Anger, fear, sadness, love, aversion, courage, dejection, desire, despair, hate, hope,
Mowrer	1960	2	Pain, pleasure
Izard	1971	10	Anger, fear, distress, contempt, disgust, guilt, interest, joy, shame, surprise
Tomkins	1980	8	Rage, fear, joy, interest, surprise, anguish, shame, disgust
Plutchik	1980	8	Fear/surprise, anger/acceptance, joy/sadness, disgust/expectancy
Gray	1982	4	Rage, joy, terror, anxiety
Tomkins	1984	9	Anger, fear, joy, interest, contempt, disgust, distress, shame, surprise
Weiner and Graham	1984	2	Happiness sadness
Ekman	1986	6	Anger, fear, happiness, sadness, surprise, and disgust
Shiner	1987	6	Anger, fear, sadness, joy, love, , surprise,
Lattell	1987	12	Anger, fear, despair, sex-lust, loneliness, pity, curiosity, pride, sensuous comfort, sleepiness
Oatley and Johnson-Laird	1987	5	Anger, sadness, happiness, disgust, anxiety
Izal	1990	11	Fear, rage, joy, interest, surprise, anguish, shame, disgust, contempt, shyness, guilt
Scherer and Carrochan	1990	5	anger, sadness, fear (3 negative) love, joy (2 positive)
Frijda	1993	6	Sorrow, happiness, interest, surprise, wonder, desire,
Rolls	2007	2	Pleasure, punishment

Table Three: innate emotions (adapted from several sources including Ortony and Turner, 1990: 316)

It is important, having identified an emotion to establish its definition. Definitions of 'happiness', for example, differ according to theory such as those who see emotions as action tendencies defining it thus: 'happiness can be seen as the state of gaining or making progress toward what one desires' (Dillard and Pfau, 2002: 295). The emotional term chosen should be a broad one with a subject like emotion it is, unfortunately, necessary to be general, as Juslin expressed: 'it is ultimately more important to avoid making serious mistakes (e.g. mistaking anger for joy) than to have the ability to make more subtle discriminations between emotions (e.g. detecting different types of joy)' (2001: 325). In emotional research it is best, as Cowie et al noted to use the 'broad domain coarsely' (Cowie et al, 2001: 51) to overcome some of the many pitfalls of research in this field.

It is also important that the emotion chosen has clear modes of emotional expression and response. A useful summary of what these modes may consist of is given here: 'information about emotion is expressed through many different modalities…the face…the melody of the voice…body posture, hand gesture…and language all carry information about emotion. Physiological measures of heart-rate, blood pressure and evoked response potentials…also allow us to describe the physical and biological processes…that occur during emotional experience' (Stein and Hernandez, 2007: 298).

Critics of this approach such as DeSteno et al argue that, 'the penchant for focusing study of the role of affective states almost solely on happiness and sadness…may mask a truer understanding of the potential influence of emotion on persuasion' (2004: 43). A separate criticism of this approach is that the emotions bulked under the over-riding term are different. Scherer et al (1998) and Burkhardt and Sendlmeier (2000) noted a distinction between 'joy' and 'happiness' and came up with different criteria for affective speech. However, it might be argued that, 'biological events produce emotions' (Thompson, 1988: 265) and that this occurs at both a micro (neurotransmitters) and macro (organs) levels (cf., Thompson, 1988). These autonomic changes are given 'understanding' by cognition and the labels we place on them but these labels are inexact and perhaps should be viewed like colours, not with discrete labels but as an 'emergent property of the complex interaction between cognitions and discrete patterns of physiological activity' (Thompson, 1988: 306). A further problem with concentrating on archetypal emotions is there is no overall agreement about what these are. Many theorists, for example consider 'disgust' to be an innate emotion but Rozin and Fallon (1987) found that children only acquire it after 7 years of age as it needs the 'cognitive sophistication' (Scherer, 1987: 13) to distinguish between the self and the outside world. Considering this complexity there is an argument for using broad measures when labelling archetypal emotions; to use Batra's terms, being 'vaguely right rather than precisely wrong' (cited in MSI, 1991: 43) or Tukey's (1962) 'far better an approximate

answer to the right question which is often vague, than an exact answer to the wrong question' (cited in Holsti, 1969: 12).

1.8 Conclusions

This chapter has discussed the evidence for emotion being both a biological and cognitive two-component process. It has presented an argument that emotion can be triggered by stimuli on a preconscious level and that this initial trigger begins a process of cognition. This chapter also included a working definition of emotion and acknowledges the contributions to understanding the subject of other major schools of thought. There is also a definition of archetypal emotions which can be tested empirically.

The next chapter discusses why emotions are present in advertising and considers that emotions are an increasingly important method of persuasion justifying the choice of subject matter of this study.

CHAPTER TWO

Why Emotional Stimuli are Present in Advertising

This chapter gives reasons why emotional stimuli may be present in adverts and argues that this is an increasingly important subject to study.

Since the 1980s, it might be argued that the proliferation and fragmentation of the media has left advertiser and audience adrift from each other. As Gordon argued, 'The 1980s and 2000s are different worlds. Advertising is no longer king. Brands have taken centre stage and are built and maintained through multiple channels of activity – internet, word-of-mouth, direct marketing, PR, brand experience, retail environments, service, design, sponsorship, partnership and so on' (2006: 8). These changes include the fragmentation of the mass media into billions of web-spaces and the proliferation of companies that can afford to utilise these cheaper, more available platforms resulting in an overload of what Comander and Wilson (1974) termed 'noise' where advertising no longer functions as a meaningful message-giver and instead contributes to the overload of information in society. This has meant a need for a radical rethink of how advertising works (cf., Himpe and Colin, 2006). Indeed, such are the changes that Pawle and Cooper argue that we are now in a new stage of marketing: 'just as products evolved to carry trademarks, and trademarks evolved into brands, now it is time for brands to evolve into "Lovemarks"' (2006: 38). Lovemarks are about building emotional connections between product and consumer, inspiring a 'loyalty beyond reason' (Pawle and Cooper, 2006: 39). Increased use of Functional Magnetic Resonating Instruments (fMRI) to view and measure emotional responses by advertisers have made it clear that, 'human beings are powered by emotion, not by reason' (Roberts (2002) cited in Pawle and Cooper, 2006: 40). Somatic coding has shown how recall of a brand triggers the limbic system as well as other areas of the brain suggesting emotions are stored with brands. If, as Bargh and

Chartrand believe, '95% of our actions are unconsciously determined' (cited in Gordon, 2006: 6) then emotions are a large part of this.

Duffy and Hooper argue that the power of the message has 'shifted firmly…into the hands of the consumer' (2003: 2) and it is time to 'harness' emotions more: 'In a world of switch-off and disenchanted customers, the time is right for a new way of communicating with these consumers…(whereby) marketers respond to both their customers' emotional and functional needs' (Duffy and Hooper, 2003: 1). Techniques that elicit emotions, then, are becoming increasingly important to advertisers. This chapter gives three ways emotions affect the responses to adverts starting with (2.1) because emotions are connected to attitude then (2.2) because emotions can be the main reason for decisions and finally (2.3) because emotional content can determine whether the advert is engaged with.

2. 1 Emotions are connected to attitude

This section discusses the idea that advertisers use emotion because it can create and alter the attitude of the viewer towards the product or service. Dillard and Meijnders found from their research: 'as positivity of mood increased, so did attitude change' (2002: 312). Petty and Cacioppo (1981) believe that attitude is emotion as it is a meta assessment – '(a) general and enduring positive or negative feeling' (cited in Newhagen, 2002: 730). Therefore, it is reasonable to connect a temporary positive affect from an advert with the more long-term feeling which has hardened into 'attitude'.

Forgas (1991) outlined processes by which emotional adverts can affect attitudes to products/services. First, 'integration' which is where emotion and cognition become confused and the feeling is interpreted as the thought. Secondly, people 'anchor' themselves to a feeling and do not adjust when approached by a new stimulus-event thus tainting it with this emotion. In both cases, what a person feels during the advert becomes stored along with

the product/service. Furthermore, emotion may help memory storage and when a 'strong reinforcer' (Rolls, 2007: 143) such as if a positive stimuli is present it will help the recall of a place and on further mention of the place then the memory of the mood will be triggered (Rolls, 2007).

There are good reasons for trying to induce positive emotions in the viewer because people think differently when feeling happy. Forgas noted how, 'positive moods start a processing that relies on heuristic (reasoning)…and has a lack of logical consistency. Negative moods start an analytical step-by-step processing' (1991: p.55). This can be explained by Frijda's goal-orientated mood idea – if a person is in a good mood then his/her goals will have been (at least partially) met and therefore s/he, 'do(es) not need to engage in cognitive effort' (Forgas, 1991: p.59). In Kelly's (1955) words, we 'loosen'. Put simply, 'good mood…reduces thinking about the ad…(and means the viewers) evaluate the arguments in an ad more positively ' (Rajeev, 1991: 21).

Branscombe and Cohen added that emotion is especially powerful because: 'few people would admit to, or are even aware of, using their own emotional states as a means of making a judgement' (Branscombe and Cohen, 1991: 145). Instead, 'most people believe their judgements are …the result of a thoughtful, rational process' (Branscombe and Cohen, 1991: 145). The recipient is unaware of the real power behind them: 'moods…influence judgements precisely because people are unaware of their influence' (Branscombe and Cohen, 1991: 187).

2. 2 Emotions can be the main reason for decisions

This section suggests that emotion is used in adverts because it can move people to action – to decide to consume the product or service.

In *Decartes' Error*[9], Antonio Damasio argues that emotions cause decisions where the individual asks only one question: 'How will I feel if I do that?' (Damasio, 1994, cited in DuPlessis, 2005: 88). Emotions offer a 'shorthand way' (Schwartz and Clore cited in Forgas, 1991: 74) of dealing with the world. This is particularly effective when there is too much information. Experiments by Andersen (1974) and Ajzen (1975) showed how the more information a subject received the more likely s/he was to rely on a general feeling to help him/her decide. As Forgas (1991) explained: 'The more facts known about a topic, the less in general will be the impact of the summary judgement due to an additional fact' (p.48). They also work especially well when there are vague ideas. Forgas, et al (1988) noted that temporary moods have a greater impact on vague ideas but not on well-formed, frequently reassessed opinions[10].

An appeal to emotions may result in a decision to consume the product-service advertised as Clore (1988) noted, 'temporary affective states may serve as information used by people as a judgement-simplifying heuristic device' (cited in Forgas, 1991: p.13). Emotions, then can be the argument; they can form the reason for choosing a product/service (cf., Petty et al (1991)). Clore and Parrott's 'feelings as information' hypothesis states that emotion provides information for decision-making – 'the output of our appraisal system' (Nielsen and Kaszniak, 2007: 368). As Schwarz and Clore (1988) explained: 'affective states are just as informative as cognition, under certain conditions' (cited in Forgas, 1991: p.13). Morris et al (2002) found positive affective attitude explained up to 37% of buying habits and

[9] The error being that we are what we know ourselves to be. There is far more than the rational conscious brain to us than that.

[10] A very simple experiment backed this up. Forgas et al telephoned a very wide range of people and asked them how satisfied they were with their life – the impersonal method and anonymity should have helped gauge a more accurate response. The only variable was the weather. Those phoned on a sunny day were markedly more satisfied than those phoned on a rainy one. They concluded that the mood is the logic for vague concepts. However, this is not always the case and bad moods can encourage the individual to try harder in order to work his/her way through the problem (cf., Branscombe and Cohen, 1991).

a highly significant correlation was found between positive emotion from adverts and buying habits.

While people are unlikely to admit to using emotions in order to decide on actions, it can be seen that, 'only very seldom can human beings act completely rationally – seldom can we know enough to predict the best course of action' (Oatley and Jenkins, 1996: 258). Without all of the facts at hand we will rely on heuristics – methods of action which has no guaranteed outcome, based on feeling. These are not a perfect solution, but are 'better than doing nothing, or...acting randomly, or…becoming lost in thought' (Oatley and Jenkins, 1996: 258). It may be with the overburdening of information that people will become more, to use Fiske and Taylor's (1991) phrase, 'cognitively miserly' as, 'humans burdened with processing demands that far exceed our time frames and mental capacities' (Rhoads and Cialdini, 2002: 529).

2.3 Emotional content can determine whether the advert is engaged with

Oatley and Jenkins wrote: 'advertising does not first get attention, and then create an emotion. Advertising creates an emotion, which results in attention.' (cited in Truss, 2006: 133). Emotionally activating stimuli have attentioning properties – the viewer is signaled to take notice of the screen and consider the value of the stimuli and will look for appetitive and stray away from aversive stimuli. As Mehta and Purvis stated: 'Neurologists today are suggesting that the attentioning process is largely out of the conscious control of the individual, and emotion rather than cognitive/rational responses guides attentioning' (2006: 50). In the case of adverts, if the images or sound can evoke pleasurable stimuli it will cause an appetitive response and motivate the organism towards it: 'emotionally significant stimuli might also reflexively capture the organism's attention and facilitate the processing of these

cues' (Schupp et al, 2003: 7). In turn, it is hoped that this attentioning power will result in more substantial effects for advertisers such as recall (cf., Mehta and Purvis, 2006).

It may be that the viewer searches for stimuli in an advert which is in accordance with current mood. The mood-congruence theory suggests that viewers of adverts are drawn to stimuli facts which most suit his/her affective state. A person in a positive mood may link into humour, for example. Fiedler added that mood affects two cognitive stages – recall and production. In a similar way, people engage in mood management when in a positive emotional state, as Dillard and Meijnders explained: 'Persons in a positive mood are expected to be quite discriminating about the messages they choose to engage because there are so many ways in which their state of elation might be disrupted' (2002: 312). Put simply, 'people in good moods will seek the least engaging stimulation in order to perpetuate their current state, while people in negative moods will seek stimulation to alter their mood (Harris, 2004: 48).

2.4 Conclusions

Emotion has become an increasingly important subject to study. Advertisers have always used methods to appeal to emotions but since the 1980s, it might be argued, these have become more prevalent as advertisers realise the benefits of them. The benefits include a way of dealing with information overload by appealing to the senses and therefore breaking through the 'noise'. There are benefits of attitude change, decision making, attention and recall when using of emotion-inducing techniques in adverts.

The next chapter examines how emotional content in and responses to adverts are assessed.

CHAPTER THREE

Measuring Emotional Content and Responses in Adverts

Chapter One discussed the complexity of the subject 'emotion' and provided a working definition arguing that there is a biological primacy to some emotional responses. Chapter Two considered why emotion is used in advertising and argued that this is becoming an increasingly important topic to study. This chapter reviews some experiments into emotion and advertising which have been used to construct a new method of testing advertising content and responses.

Mehta and Purvis noted how there is no agreement in how to test adverts for emotional content or responses: 'advertisers have long believed that advertising must arouse some emotion to be effective (but)…there is little agreement among advertising researchers about how exactly emotion works to influence the overall impact of advertising, or even how emotional response in advertising can be measured or evaluated' (2006: 49-50). The result of this is that testing for emotional content and responses is done in a variety of ways. This chapter discusses some of the ways emotional content and responses to adverts can be measured.

The chapter starts with (3.1) ways in which adverts can be tested for emotional content including (i) interviews with advertisers and (ii) content analysis, discussing the benefits and drawbacks of each method. The second section (3.2) discusses ways adverts are tested for emotional responses which include: (i) self-report and (ii) biofeedback as well as (iii) other methods used. The final section of this chapter considers (3.3) factors which should be taken into consideration when testing for emotional responses including mood, personality, handedness and use of stimulants.

3.1 Testing adverts for emotional content

One way of ascertaining emotional intention in advert is to (i) use interviewers of the encoders. This section argues that is a seemingly simple and direct way of finding out what emotional content is included in adverts. However, the situation is not this simple as it presumes that the encoders of an advert are aware of the reasons why content was chosen. Adverts are partly the result of institutional pressures and generic expectations. Furthermore, as with most media texts, they are the result of many creators. There is the additional problem with emotion in that the individual is not always conscious of this phenomenon or will admit to using it. A second way is to (ii) use content analysis to decode the text for emotional content. This section discusses the nature of these technique, first by defining the subject matter arguing that they can be seen as being a recoding rather than decoding, then acknowledging that they are a limited reading of any text.

(i) Interviews of the encoders of adverts

An interview occurs when, 'a participant is asked questions which have been designed to elicit particular types of information' (Hayes, 2000: 113). At its most basic it is, 'a conversation with a purpose' (Gillham, 2000: 1). Interviews are a useful way of getting in-depth responses and can help to discover advertisers' intentions to include emotional content. Asking for them can lead to a high success rate as Gillham noted, 'people are, in general, far more willing to devote an hour...to an interview (even if no benefit to themselves) than to give fifteen minutes to the completion of a questionnaire' (Gillham, 2000: 15) as people like the attention, like to be listened to and like their opinion to be considered which are all human needs fulfilled by an interview. Zaltman (1995) argued that for advertising, 'we must consider reason and emotion as forces which comingle' (39) and stated that interviews of

advertisers was the best way to gain insights into advert encoder intentions. Semi-structured, indepth interviews have been used by Nyilasy and Reid (2009) and Smit et al (2009) as a way of finding advertiser intentions but while interviews are often used to assess audience response there is a more limited list of examples of advertiser interview. This may be because of the nature of the industry being pressurised for time and subject to keeping secrets of the client.

Two disadvantages of interviews are that they are time-consuming and costly. Another drawback is how open they are to having the responses distorted as they rely partly on the interaction of the interviewer and interviewee. Interviews are, by their very nature, subjective[11]. While the concept of objectivity in research may always be viewed with scepticism,[12] the potential for the interviewer to lead the interviewee and for deception is high. A further problem with the interview, specific to the subject matter of 'emotion' is that it may not only be difficult to understand and interpret but also to express, particularly as: 'there is a suspicion in Western culture that there is something wrong with emotions' (Oatley and Jenkins, 1996: 38). This idea extends back to ancient Greece and, 'Plato, who held that the only moral means of persuasion was grounded in logic' (Dilard and Pfau, 2002: ix) placing emotions in the 'lower mind' and extends through Western ideology and a distrust in persuasion because of what Newhagen explained as, 'The Jeffersonian democratic tradition, with its foundations stretching back as far as Milton, elevates reason to be 'good' in that logic drives decision, while persuasion is 'bad' because it is driven by emotion' (Newhagen, 2002: 735). Darwin (1872) connected emotions with our evolutionary heritage so to call someone emotional may therefore imply irrational. An interviewee may therefore be reluctant to discuss a subject which connects him/her with such weakness. Furthermore, emotions can be seen as both, 'a guarantee of authenticity' and 'our best guide to our true selves' (Oatley

[11] It is important to make the distinction between subjectivity on the part of the researcher which may indeed 'contaminate' and the subjective responses from the interviewees who provide insight and understanding.
[12] Hayes comments that the need to be objective in research is a legacy from behaviourist methodology's insistence that human experience is a 'contaminating influence' (2000: 120/1)

and Jenkins, 1996: 38) which has its own problems as it may be difficult to 'open up' and reveal intimate experiences, especially in the formal situation of an interview to a stranger. Another problem with interviewing the encoders of an advert to find out intentions is that it will be the result of a group process with copy-writers and art directors responding to market research and the client (cf., Tunstall, 1964; Mayer, 1958). Furthermore, 'no source communicates as a free agent' (Berlo, 1960: 49) instead the advert is a product of cultural norms, generic form and institutional practices. These restrict the message-maker who may not be aware of such issue considering the formation of adverts to be common-sense.

(ii) Content analysis

There is a more substantial history of content analysis of adverts to try to discover encoder intentions. Content analysis is often used to discover emotional appeals in advertising. Hong et al (1987) compared expressions in faces in Japanese and American magazines by content analysis. Olney et al used the method to test how viewing times alter emotional content of adverts. Huhmann and Brotherton (1997) studied guilt appeals through this method. Indeed such is the widespread nature of content analysis of advertising that meta analyses of these methods have been produced in the Journal of Consumer Research in 1977 and 1991 (cf., Kolbe and Burnett, 1991).

Content analysis is a technique of measuring media content in which 'trained coders use specific rules and definitions to identify…and quantify…in programmes' (Gunter, 1987: 10). A useful term to use when considering the style of content analysis is 'demystification' (cf., Barthes, 1972) - making the 'natural', hidden, meanings in a text obvious (so making them 'unnatural'). The practice goes back to the eighteenth century (Dovring, 1954) but as a research technique, to the twentieth century (Holsti, 1969) with early practitioners such as Harold Lasswell, Abraham Kaplan and Ralph White practicing and developing the technique

(Holsti, 1969). Berelson defined content analysis as, 'the objective, systematic and quantitative description of the manifest content of communication' (Berelson, 1952, cited in Gold, 1994: 20). Useful as this definition is, since this was written it might be seen that there is a greater understanding that there can be no true 'objective' even by experienced content analysers who, 'impos(e) their own meaning systems rather than taking meaning from the communicated content' (Gold, 1994: 21). Furthermore, 'there is no necessary equivalence between the encodings and decodings of messages' (Gold, 1994: 19). As every reading is coloured by subjectivity so the word 'objective' could be re-termed 'systematic' (Cottle, 1998: 4) This is in line with a more modern interpretation of content analysis: 'quantitative content analysis is the systematic and replicable examination of symbols of communication, which have been assigned numeric values according to valid measurement rules and the analysis of relationships involving those values using statistical methods, to describe the communication, draw inferences about its meaning, or infer from the communication to its context, both of production and consumption' (Riffe et al, 2005: 25).

There are many drawbacks to using content analysis: they are time-consuming, subject to error in the definition of content and subject to coder error. Furthermore, texts are the potential bearers of so much information and, in Paquin et al's (1995) words: 'the text is said to function in a polysemous fashion and the many interpretations it engenders never deplete it' (19) so it is not possible to find content as the audience may receive it. Content analyses are by their nature, 'reductionist', 'reduc(ing)…communication phenomena to manageable data' (Riffe et al, 2005: 24). Laurier adds to this stating: ''decoding' is a phrase that I have a problem with since it signifies that same notion of demystification discussed by Barthes, and it is perhaps more useful to write 'recoding' since what normally occurs is a shift from a combination of an image and a short phrase to an extended piece of writing which seeks to re-write the advert' (1993: 270).

3.2 Testing emotional responses to adverts

The last section discussed how emotional content can be studied in adverts. This section considers two main ways emotional responses to audio-visual texts can be measured: (i) self-report, and (ii) biofeedback. It then considers (iii) alternatives to these methods including using neuroscience and hypnosis.

(i) Self-report

Marci (2006) traces the history of testing advertising for emotional responses dating back to the 1950s. Prior to this, emotion has been factored into audience response from the earliest stages of television. Gunter (2000) states that the BBC from the beginning of testing responses to television programmes considered emotion to be important as in 1941 they included enjoyment as a factor in their programmes' success and not only asked for the audience to rate this but gave a space for comments to gain more detail. Their rival television company ITA copied this but in the 1960s tested emotional responses by using semantic differential scales. Another way of testing emotional responses to television is a continuous response measurement. This real-time collection of data has taken place through an on-off button linked to a time graph which could record when the subject liked what s/he saw and multiple scales. All of these methods might be seen as problematic. One issue is definition of terms in the case the BBC's tests: what is 'enjoyment'? Both the BBC and ITA tested after the programme meaning there are issues of recall of emotions after the event. There are also logistical problems for the subjects, the 'on' button often being left on by mistake and the multiple scales to be marked with a level being too complex while concentrating on a screen (cf., Gunter, 2000).

Testing emotional response to media texts is not an easy task as the definition of what emotions are is difficult, then there are problems of measuring intensity and the logistical

issues of time delay and equipment use affecting responses. There are many methods used to test advertising and emotion such as Polegato and Bjerke's (2006) survey using 328 semi-structured questionnaires via email on values using a 7-point Likert scale concluding that if the consumer's values match those in the advert it will be more successful. This positive correlation between emotions and effectiveness was confirmed by Adtrack (cited in DuPlessis, 2005: 145-9) who looked at 23 commercials concluding that 'ad-liking' increases awareness of the product and message that if the liking score was 5/10 the recall was 3%, if it was 6/10 it was 10% and if 7/10 it was 33%. Both studies used the word 'likeability' but there are problems with the issue of defining this as well as debate about whether liking is an effective measure. The Copy Research Validation Study by the American Advertising Research Foundation (cited in DuPlessis, 2005) asked advertisers to identify adverts which had been successful and unsuccessful and cross-checked this with self-report tests on liking and decided that this was not a factor suggesting that positive feeling rather than liking is a more important factor.

One problem with self-report tests is the short-term nature of them - adverts are often repeated meaning the effect is cumulative. In response to this, Eden and Chapman-Moore (1991) tested for three emotions, upbeat, warm and negative and cross-checked these with three judgments, evaluation, activity and gentleness. Adverts were shown once to some subjects and once a day for 5 or 10 days to others and measures were taken just after the advert and after a delay period of a week and a month. The results showed that, 'upbeat feelings had direct effects on attitude toward the brand' (MSI, 1991:.33) and over time: 'ad-induced feelings were found to influence attitude toward the ad and the brand even after a three-day delay between exposure and ad-brand evaluation' (MSI, 1991: 34).

Rosenberg (1982) also conducted a longitudinal study of brand and emotion termed ARS Persuasion which measures adverts' ability to change what people want and Related Recall finding that a positive emotional response was important to the adverts' desired

effectiveness. He performed 5000 ARS tests in 200 categories using phone calls, with subjects selecting a brand then after 18 commercials were shown to them twice seeing if it changed their choice. The results were: 'image and mood ads can have measurable sales effect in market' (MSI, 1991: 38); 'selling the feeling can sell the product' (MSI, 1991: 38) and emotions 'can be effective when added to a brand-differentiating strategy' (MSI, 1991: 38).

While self-report is a common method, the way this has been done is often subject to criticism. One major issue is the correlation (or lack of) between words and feelings - 'verbal measures are limited in their ability to tap a person's emotional experience' (Hazlett and Hazlett, 1999: 9). Table Four gives detailed problems of using words to measure emotions.

Verbal reports are inadequate because:
1. may be used to deceive
2. may be distortions or partial truths – unconscious or conscious
3. depends on subject's oral ability
4. usually asks for recall of memory which is unreliable…
5. …immediate response, on the other hand, changes the emotions as it is being asked for
6. children do not know what the emotions are
7. mentally disturbed cannot verbalise it
8. ambiguous language
9. emotions are complex –never a pure state

Table Four: list of problems with self-report (Plutchik (1994)

There are many methods of self-report often giving the subject adjectives to assess the valency of emotion which can be ticked or circled. Plutchik and Kellerman's (1979) method added intensity to this by asking for two ticks if the subject definitely felt it, one tick if slightly and '?' if not sure. One problem with this method is the amount of words for feelings. Davely (1970) asked people to describe their emotional experiences and counted 556 words used (cited in, Plutchik, 1994: 6). Advertising agency N W Ayers ended up with 18 clusters of 58 words in order to ascertain emotions from adverts (MSI, 1991: 9). Even if the correct words can be identified, they are, as Langer (1978) expressed, not ideal

descriptors of internal feeling: 'verbal statement…is almost useless for conveying knowledge about the precise character of the affective life. Crude designations like 'joy', 'sorrow', 'fear' tells us little about vital experience as general words like 'thing', 'being' or 'place' tell us about the world of our perceptions' (cited in Budd, 1985: 110).

In order to try to limit the problem of verbal reports methods have been designed to test known emotional responses to audio-visual texts (see Table Five). Semantic Differential scales are one method of assessing emotions (cf., Laird and Strout, 2007). Tennerbaum (1957) used this method based on three main factors for each word: evaluation (good or bad); potency (strength) and activity (speed of response, liveliness etc). Semantic Differential scales have the disadvantage of the subject having to move away from the screen to use; the physical act of marking a sheet breaks concentration from the text. Semantic differential scales rely on words and, 'when…semantic differential scales are used to assess emotion, the precise meaning of the emotional words may vary from person to person' (Morris et al, 2002: 8) and it is a time-consuming act to consider bipolar emotions, then the level felt between them. This same problem can be found The Watson and Tellegen Positive and Negative Affective Schedule (PANAS) which was, 'the most prominent structural/assessment scheme in research on self-report' (Gray and Watson, 2007: 173) based on a two-way scale - negative or positive states. While well established and easy to complete (Ruef and Levenson, 2007) the written nature of it does not allow continuous sampling of affective states (Ruef and Levenson, 2007) and as Cowie et al (2001) noted: 'pure emotion is relatively shortlived' (50).

Method	Description	Examples of Researchers
Interview	The subjects report on their emotions	Wilson and Nisbett (1977), Schachter and Singer (1962)
Mood adjective checklist	Emotional adjectives given to subjects who tick, double tick etc. to show strength of feeling	Plutchik and Kellerman (1979)
Semantic differential	Subjects are given opposite emotions and asked to indicate how they feel by marking a line between them.	Watson et al, Osgood et al (1957)
Self Assessment Manikin	Pictures used representing feelings	Morris et al (2002) Bradley and Lang (2000)
Affect Rating Dial	Joystick moves lights from positive to neutral	Gottmand and Levenson (1980) Kahneman (1983)
Feeltrace	Subjects move cursor around circle to indicate type and strength of emotion	Douglas-Cowie et al (2000) Schubert (2001)

Table Five: self-report test methods and examples of research using audio-visual texts

Avoiding the problem of both words and the need to interrupt viewing, The Affect Rating Dial (ARD) was developed by Gottmand and Levenson in the 1980s and Kahneman (1993). Participants in experiments moved a joystick over a 180 degree arc going from very negative to very positive via neutral, using a sliding button through 7 lights. While it has the advantage of operating in real-time, this method is limited in the emotions it can report. Also avoiding some of the problems of verbal self-report is the Self-Assessment Manikin (SAM). This 9-scale pictorial method measures valence, arousal and dominance. SAM has benefits of being able to be used cross-culturally (cf., Bradley et al, 1992) because of its pictorial nature. This method is based on the PAD theory of emotions (cf., Morris et al, 2002) that three bipolar dimensions of pleasure, arousal and dominance cover all emotions which does not take into account the idea of the innate properties of discrete emotions (cf., Ekman 1989, Brown 1991, Schwartz 1992). Nevertheless, SAM has proved to be a useful measure of responses to adverts. Morris et al's (2002) study of the emotional responses of 23,168 respondents of 240 adverts over a year also was admirably thorough (they noted how in all the other experiments they had studied using a similar method, none had sampled more than 120 people (Morris et al, 2002)).

Another method of testing for emotional responses is Feeltrace, a moment-to-moment, real-time assessor of emotion allowing the floating nature of feeling to be registered. This overcomes the problems of retrospective judgments and the possible 'duration neglect' (Gray and Watson, 2007: 178) which is a tendency over time to neglect more subtle feelings and the length of time feelings were experienced. The Feeltrace screen is in four sections (see Figure Four) with a negative integer appearing in the results in all but the hedonic section. It is a 'continuous response tool' (Schubert, 2001: 394) allowing real-time analysis of audio-visual texts and has a non-verbal method of recording valency and intensity of emotional responses to audio-visual texts. Developed by Douglas-Cowie et al, Feeltrace is a complete package coming with full training for both experimenter and participants to allow standardised comparison between previous tests and experimental authenticity not to mention ease of use for both parties. Feeltrace allows the identification of discrete emotions, includes a wide range of emotions and does not rely wholly on words, records arousal level.

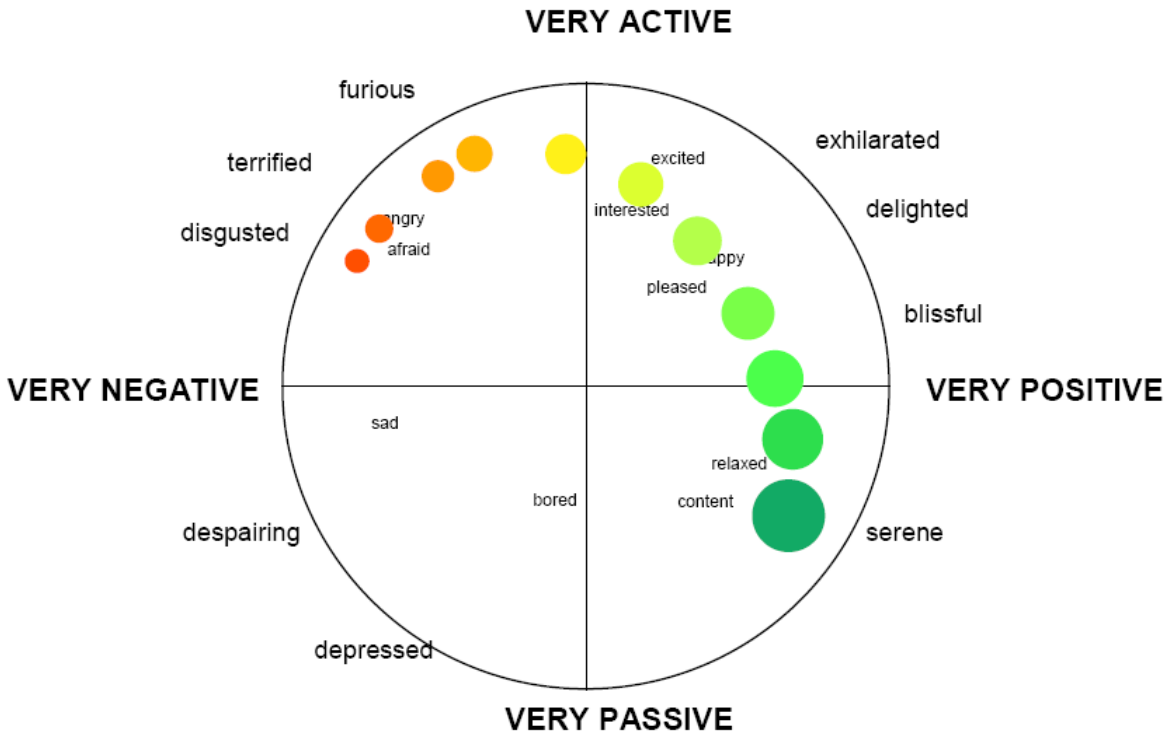

Figure Four: Feeltrace screen showing four different sections.

Feeltrace was developed from Plutchik's 'emotion wheel' which placed emotions according to their types and valences into a circle. This recognises that emotions are linked – happy and ecstatic, for example, and that they are, as here, sometimes expressions for the same emotion but a greater intensity. As with all studies on emotion, Plutchik's list is a product of theory in his case on the links between biological motivation and the affect system that resulted. There is a criticism of this from Cowie et al who noted how these 'archetypal emotions' only cover a small part of emotional life but as they state, there is a need to be pragmatic: 'category labels are not a sufficient representation of emotional state, but they are probably necessary' (Cowie et al, 2001: 42). Feeltrace partly overcomes the problem by using a coloured cursor which changes colour and size according to its place on the wheel so it is possible to record emotions outside of the verbal categories.

(ii) Biofeedback

A second method of testing emotional responses to adverts is to measure the signals sent out by the brain to the cardiovascular-visceral system. Some of the places where such responses can be measured are in Table Six along with examples of researchers into audio-visual texts who used the method. This use of biofeedback measurement has the benefit that it can monitor the unconscious emotions, as Marci stated, this is necessary: 'it is now well documented that by the time information gets into conscious awareness, the brain has processed that information to the point at which it is far removed from the original 'primitive brain' responses' (Marci, 2006: 386).

Method	Description	Researchers using method
Heartbeat	Test for decrease or increase in heart-rate	Mandler and McDowell (1989)
Blood pressure/volume	Test for blood flow to the viscera and the skeletal muscles.	Brod (1959)
Electroencephalogram	Brainwave measurement	Orozco, Wall and Ehlers (1999) Bower (1981)
Galvanic skin response/ skin conductance response	Electrical signals to skin assessed	Spiesman et al (1964) Hassett (1978)
Face	Electromyography is used to measure biofeedback signals to the face	Calder et al (2000) Hess and Blairy (2001)
Blood, urine and saliva	Measure the chemical change in blood, urine and saliva resulting from an audio-visual text	Dabbs (1987) Werner and Pfluger (1990)

Table Six: ways of testing adverts for biofeedback and examples of research using audio-visual texts

Biofeedback is explained by Rickard: 'when a stimulus…is perceived as significant, an increase in physiological arousal results helps prepare the body for action. Common physiological responses include activation of the sympathetic nervous system (resulting in increased heart rate, blood pressure, respiration rate and muscle tension, and decreased skin temperature) and the release of arousal hormones (such as noradrenalin and cortisol) from the adrenal glands' (2004: 372). It is at this point, the assessment can happen. It is also how emotions have their power as this is an uncontrollable act which not only urges the recipient to respond to the advert but also suggests a likely emotional response to it. Biofeedback has the benefit of allowing the assessment of pre-conscious SECs in response to the sensory cues in the adverts that are, 'emotionally charged' (Compeau et al, 1998: 230). These responses may not be acted on consciously and so self-report would not be able to measure them.

Biofeedback has the benefit of being able to record electrophysiological responses, or as they are stimulus affected, Event Related Potentials (ERPs). These ERPs occur precognitively thus avoiding the many pitfalls of effects research. They rely on the assumption that the human system is pre-wired to respond to stimuli in certain ways. Scherer (1987) surmises that there are two stages of precognitive checks the body undertakes before the individual considers the value of a stimulus. These are the Novelty Check familiar to all organisms where senses are working automatically to find changes in the environment and the Intrinsic Pleasantness Check which considers whether the stimulus is to be approached or

avoided. From here, cognitive processes occur where the stimulus is assessed for its ability to fulfil the organism's goals or needs followed by a Coping Potential Check which decides the course of action and a Norm/Self Compatibility Check considers social and personal conventions of any response. ERPs can inform cognitive processes and direct the individual to a certain emotional response.

The measurement of biofeedback responses to place adverts is often done under controlled conditions with the presumption that the emotions the stimuli can evoke are just as much observable in laboratory as field conditions: 'in the laboratory, as in life, emotional reactions can be evoked by stimuli in different sensory modalities' (Bradley and Lang, 2000: 204). As Vastfjall et al state, affective responses will still occur in laboratories: 'emotions are experiences both in real and virtual environments' (2002: 19). Advances in technology have meant sophisticated analysis of biofeedback responses is now a financial and procedural possibility for an individual to achieve: 'a half century ago, psychophysiological tools were used by a highly specialized group of scientists with specialist training and esoteric laboratories that resembled an electronics part emporium…Advances in electronics and computer technology have made psychophysiological tools far more accessible to non-specialists' (Curtin et al, 2007: 398). Laptops and digital recorders of biofeedback have made the process affordable to an individual researcher without losing the quality as the technological advances have improved on previous analogue systems – 'features once found only in the costly, high-end, commercial work stations are now standard options in consumer-level personal computers of today' (Curtin et al, 2007: 402).

One biofeedback measure which is often recorded when testing responses to audio-visual texts is the face (see Table Seven). There is strong evidence that facial expressions are genetic and the face is a portal to affective states. As Davis et al, stated: 'the rationale underlying this approach is that facial electromyograms represent proportionate motor concomitants of central affective states' (1995: 233). One experiment into adverts using

EMG was by Marci (2006) who tested responses to a beer commercial using skin conductance, heart rate and motion as the measures. With 27 males between 25-35 years old he compared the responses of those who saw the advert in the break of a 'successful' programme and an 'unsuccessful' one. Placed in the 'unsuccessful' programme, the beer advert scored lower for attention and engagement. Another piece of advertising research into its emotional effects using EMG was by Hazlett and Hazlett (1999) who tested 25 females using facial EMG measures. This method they claimed to be, 'a much more precise and sensitive measure' (Hazlett and Hazlett, 1999: 10) to others and one which has the benefit of being able to measure valency by placing the sensors on particular muscles (corrugator supercilli for negative emotions and zygomatic for positive) and intensity as it measures the level of emotional response. Hazlett and Hazlett concluded that self-report studies recorded, 'none of (the)…internal conflict or emotional intensity' (1999: 14) that the EMG recorded.

Researcher(s)	Date	Emotions tested	Audio-visual Stimuli	Methods of testing biological responses	Subjects	Results
Calder et al	2000	Happiness surprise, fear, sadness and anger	Photographs of faces showing emotion caricatured to show differing intensities	Self report rating emotions from 0-10 not emotion to very emotion	6 male, 6 female students age = 17-25	Our understanding of emotions does not rely on how face-like the expresser is but on the way key signifiers such as mouth and eyes are positioned.
Hess and Blairy	2001	Happiness, fear, sadness, anger, disgust, surprise	Video showing black and white stills using Facial Action Coding System (FACS) - 15 seconds each	EMG Filmed with hidden camera	41 female students average age = 25	Emotional contagion from photos
Doherty	1998	Happiness sadness	10 black and white photos from Family of Man (1955) judged by 48 people. Computer screen with 15cm scale from extremely negative to extremely positive (-10 to +10)	Subjects saw explanation of experiment in neutral mode and did experiment then half in sad and half in happy mode 3 weeks later	71 students, 44 women, 27 men, average age = 25	Those shown happy video spent less time processing photos so suggests happier mood, also happy and sad moods corresponded with ratings of photos.
Fischer et al	2003	Fear	Photos shown for 20 seconds	fMRI	8 male students average age = 26	Emotional contagion from photos but this decreases with repeated showings
Orozco and Ehlers	1998	Happiness, neutral and sadness	36 faces 12 of each emotion	EEG, EOG	18 male and 17 female students age = 18-25	Males responded to male happy faces quicker than to female happy faces and women also respond quicker to their own gender's happy emotions. Women more sensitive to emotional stimuli than men.
Orozco, Wall and Ehlers	1999	Happiness and sadness	132 neutral, 24 sad, 28 happy	EEG	15 men age-21-25	Alcohol has a small effect on electrophysiological responses
Peper and Karcher	2001	Anger	Angry FACS, loud noise	EOG, EMG. SCR, HR	22 Males, 19 females. Schooling = 12 yrs	Right brain hemisphere controls the conditioned response to anger stimuli

Table Seven: experiments testing facial emotional contagion

Heart-rate is another biofeedback measures used and one of the main ways advertisers test emotional responses to adverts (MSI, 1991: 17). Watson and Gatchel (cited in Marci, 2006: 385) noted how advertisers have been testing their output using heart-rate monitors for many decades. Changes in heart-rate to assess the effect of a stimulus can be tested in a number of ways including by electrical amplification using an electrocardiogram or listening for soundwaves with a Dopple Electrograph. Light sensors can illuminate the blood density going through the vascular beds using photoplethysmography. Blood pressure can also be taken using arterial cannulisation. Using each method, though, has similar problems: individuals have differing heart-rates so there is no common baseline from which to assess

affect and the situation of being tested may increase their heart-rate rather than the stimulus. There is also the issue as to what is to be measured whether it is blood pressure, heart rate increase, decrease or irregularity and then the question of what these changes signify. Bradley and Lang suggested that response is actually triphasic with affective stimuli offering a deceleration, then an acceleration followed by deceleration of the heart (Bradley and Lang, 2007: 39). Nevertheless there are patterns to heart-rate caused by emotion: 'pleasant pictures (cause)…increased peak acceleration, compared with viewing unpleasant pictures' (Bradley and Lang, 2007: 39) and, 'positive stimuli evoke an increase in heart rate while negative stimuli generally lead to a decrease in heart rate' (Poels and Dewitte, 2006: 25). However, in the case of some emotions such as happiness and anger it increases so this measure needs to be taken with other indicators such as skin temperature as: 'indices such as HR and finger temperature have been found to differentiate the primary emotions to some extent' (Rickard, 2004: 373).

Another biofeedback measure often used to test emotional responses to audio-visual texts is skin conductance – 'a reliable indicator of sympathetic nervous system activity' (Cornelius, 1996: 122). It too measures unconscious emotions as well as conscious. The electrical signals to the skin are stimulated, 'without the subject's conscious awareness' (Peper and Archer, 2001: 936). Skin conductance is, 'enervated' entirely by the sympathetic nervous system' (Rickard, 2004: 382) and mediated by acetylcholine rather than the noradrenalin that, it is thought, triggers much of the sympathetic nervous system (Rickard, 2004: 383). Like heart-rate, skin conductance gives a more general measure of emotional arousal as Vastfjall et al noted: 'In terms of physiological reactions, pleasantness is related to zygomatic and corrugator facial activity, whereas arousal is mainly linked to electrodermal activity' (2002: 29). This is another useful measure into emotional response and especially on the fingers as it shows that the subject has been called to action by the audio-visuals an indicator of emotional response. Skin conductance is a relatively non-invasive way of

assessing the response of the eccrine sweat glands and while 'sensitive' (Poels and Dewitte, 2006: 25) in the sense that it picks up small changes it is a rather coarse in the sense that it can only assess negative or positive emotions and for that matter 'very pleasurable or very repellent advertising stimuli' (Poels and Dewitte, 2006: 25).

One experiment using skin conductance measures to test responses to audio-visual texts was by Spiesman et al, in 1964, who produced a series of experiments showing a film about 13/14 year-old boys having their penises cut in subincision to male college students. There were three different versions, one which was silent, one which urged the viewer to see it objectively (Intellectualized), another with a calmly explaining that this was a joyous occasion for those involved (Denial) and a fourth which emphasised the danger (Trauma). The Trauma group showed a marked increase in skin temperature from the others in the test. Spesman et al study was an early stepping stone into the area of biofeedback emotional testing. Since then, the equipment has got less bulky, more accurate and less expensive bringing it in the reach of all universities and even individual experimenters.

(iii) Other methods of testing audio-visual texts for emotional response

As well as self-report and biofeedback there are other ways of testing emotional responses. Table Eight lists some of the ways and examples of researchers into audio-visual texts using these methods. This section considers other ways emotions can be recorded empirically: kinesics, using neuroscientific methods and analysing chemicals in blood, urine and saliva.

Method	Description	Researchers using method
fMRI	Brain scan to measure changes in brain activity to emotional stimuli.	Morris et al (2001)
Voice	Analyse the way words are spoken in response to phenomena according to tone, pitch etc.	Zajonc (1980)
FAST – Facial Affect Scoring Technique	Look for changes in expression	Ekman and Friesen (1975)
Symbolic analysis	Place subject in emotionally affecting position, ask them to tell a story or draw a picture and analyse it for symbolic meaning	Allen (1993)
Kinesics	Analyse movement of hands, feet etc to ascertain emotion	Birdwhistell (1963)

Table Eight: other methods of measuring emotional responses to audio-visual texts

Kinesics is, 'the systematic study of those patterned and learned aspects of body motion which can be demonstrated to have communicational value' (Birdwhistell, 1963: 125). The movement of hands, legs, fingers etc. may reveal something about the emotional state of the individual. Indeed, Birdwhistell (1963) stated that: 'every external movement in human beings is a source of information about the psychophysiological state of the person moving' (155). This may be a little extreme as some movements, such as driving a car, do not reveal inner states. However, when there is no real need for bodily movement then its expressive functions can be analysed as, 'almost all twentieth-century theories of emotion postulate some kind of linkage between human emotional experiences and physiological activity' (Thompson, 1988: 74). One problem with kinesics was observed by Darwin (1872): 'The study of expression is difficult owing to the movements being often extremely slight, and of a fleeting nature' (cited in Carlsen and Hatfield, 1992: 212). Also, people have what Hothschild (1983) called a 'managed heart' as they learn not only 'surface acting' which can suppress emotions from being shown but also 'deep acting' changing the actual emotions received. As he stated, people have, 'the ability to suppress and alter the actual emotion felt as they intervene…either in creating the inner stage of a feeling or in stopping the outward appearance of one' (Hothschild, 1983: 36).

In the past, lesions in the brain and Electroencephalogram (EEG) have been relied on to assess brain region activity but fMRI allows real-time studies of how stimuli affect brain patterns. EEG technology is used in advertising tests and before Functional Magnetic Resonating Instruments, (fMRI) was the only choice. Rossiter et al (2001) registered brain electrical response to advertising stimuli by selecting two areas of the brain, considered to be concerned with memory and testing whether on a repeat showing seven days later of a new advert, the electrical signals registered a memory of the visual stimuli. As with many experiments of this type, the sampling of the subjects can be questioned but the experiment is of a complex nature, requiring laboratory work and electrodes placed on the scalp so selection tended to be by convenience and often those in a university setting.

Advances in technology have meant that fMRI[13] is favoured over EEG. It is more precise, less prone to equipment issues and placement debates. The ability of fMRI scanners to view the electrical activity inside the brain has revolutionised the study of emotion putting rest to the idea that: 'emotions have generally been considered too personal, elusive, and variable to be studied scientifically' (Peretz, 2001: 106). Emotionally activating stimuli are placed in front of the individual and their brains scanned to see where the electrical activity occurs. One example of fMRI being used to test emotional responses to audio-visual texts is Osaka et al (2003) who tested the route of electrical activation from Japanese onomatopoeic words for laughter finding they activated the visual cortex, the cerbellar vermis suggesting a motor response and the anterior cingulate cortex showing a heightened level of attention. Buchanan et al (2000) tested for cortical responses to different emotional prosodies. They found that happy or sad phonemes resulted in higher activity in the right frontal cortex and that the left hemisphere specialises in auditory duration while the right detects pitch contours. Zalla et al (2000) looked at the effect of winning on the brain and concluded that winning

[13] For example emotional testing is done by Neurosense Consultancy for VBS, the advertising company behind Paramount and its many media outlets (Swain, The Guardian).

produced significant activation of the left amygdala while losing activated the right amygdala helping to locate more precisely which parts of the amygdala work for which emotions.

fMRI can produce confused results due to the uncharted brain (cf., Morris et al (1999)). There are other problems with using magnetic resonating technology. fMRI is a procedure for measuring changes in 'hemodynamic events' (Norris et al, 2007) – the increase in oxygentated haemoglobin in the brain which suggests increased activity but there could be other causes of oxygenation. fMRI measures the rate of oxygen increase but the areas of the brain connected to specific emotional responses are uncharted so it discovers 'emotion' and intensity rather than its specific valency. Another problem with fMRI is the stress of the testing method. Whether anyone's responses to adverts while in a scanner could ever be considered to be 'normal' is questionable. Added to this is the supine position necessary which would be a false viewing experience.

Another way of studying emotions is to go to the core chemicals which cause the bodily changes which we perceive as emotion. Neurons, 'living cells that transmit information throughout the body' (Thompson, 1988: 17) transmit hormones secreted by glands: pineal, pituitary, thyroid, parathyroid, thymus, adrenal, pancreas and testes which are largely controlled by the brain. These glands pass hormones through the body which create various effects. Ideally, assessing emotional effect would mean discovering which hormones have been secreted by the glands which could be done either through blood test or urine sample. There are, though, problems with testing urine, blood and saliva for chemicals indicative of emotional response. Harrison et al, (2000) measured chemicals in saliva but acknowledged that the indicator looked for, secretory immunoglobulin is quite a general response to being stimulated and cannot determine between emotions. Another problem with this method is that hormones are measured in pictograms (a trillionth of a gram) which, as well as being remarkably hard to detect, also disappear from the blood quickly (making blood samples very difficult). Hormones also affect each other so discovering one chemical in

isolation does not explain the effect the brain hoped for when it met other chemicals in the destination; some chemicals also have dual functions which will be determined when they reach their destination. Another problem with this method is that chemical levels in blood and urine vary through the day so any attempt to assess the effect of a stimulus on the emotions would have to take into account that at certain points in the day, chemicals would be in the blood or urine anyway. This is not to say that it is impossible, gas chromatography can accurately detect hormones in blood and urine, (Thompson, 1988) but getting people to agree with the tests is a problem, leaving the researcher with a sample of people who do not mind having intimate samples taken and also one whose emotions have been affected by the strain of doing this task.

3.3 Factors which affect responses to adverts

Whichever method is used to assess emotional responses to adverts there are factors which should be taken into consideration. This section looks at factors which can affect emotional responses to adverts – those which experimenters must be aware of: (a) current emotional state, (b) handedness (c) personality, (d) stimulants and (e) other factors.

a) Current emotional state

The individual's current emotional state – or mood - also affects the responses. 'Highly aroused' subjects, suggests Konecni (1979) prefer low information systems so the texts which contain the least amount of different stimuli will more appeal to them. Mood congruence theories have shown that the individual is much more susceptible to information which matches his/her mood, as Doherty expressed: 'people in a particular mood should be motivated to pay selective attention to information that is congruent with their current mood' (1998: 190). Doherty's (1998) research also showed mood congruence affects the length of

time the individual looks at the stimulus so this may have an effect on the outcome in terms of concentration on the screen. There are ways of measuring mood such as the Current Mood Questionnaire (CMQ) by Feldman et al (1998) but the UWIST Mood Scale is quick and simple to complete helping the smooth running of the experiment and its 'excellent internal consistency' (Gray and Watson, 2007: 177) and should yield reliable results.

b) Personality

The, 'characteristics of the person that account for consistent patterns of behaviour' (Pervin, 1993: 3) may affect the responses to adverts. The subject of personality (or temperament) recognises that, 'No two individuals behave or think exactly alike and therefore no two people have exactly the same personality' (Fox, 2008: 56). This might make for an impossible task to predict responses except individuals share traits (cf Allport[14], 1961). These predispositions to behave in certain ways are measurable although the ways in which this is done are varied. Critics of the trait approach argue that individuals react to situations according to current need and are not the ordered, rational beings trait theorists suggest. Furthermore, the need to place people in categories may say more about the categoriser than the subjects, the imposition of observable traits are no more than descriptions of behaviour not explanations, what Briggs (1989) termed, 'convenient fictions by which we communicate' (cited in Pervin, 1993: 333). McAdams (1991) called trait theory, 'the psychology of the stranger' (cited in Pervin, 1993: 334) suggesting that it was no more than a quick portrait.

These criticisms must be accepted but for the purpose of testing emotional responses, trait theorists have created replicable and reliable methods. The 'best' (Costa and McCrae, 2005) measurement of traits, the Eysenck Personality Questionnaire (EPQ) was adapted from the Maudsley Personality Inventory. The EPQ simplified the language and question

[14]Gordon Allport identified around 18,000 personality traits but many are synonyms (cf., Fox, 2008)

structure, gave clear instructions on use, became widely available through the publication of *Know Your Own Personality* (Eysenck and Wilson, 1975), was tested cross-culturally and over time and age ranges [15]. This widely used inventory is one way of gaining information on personality as a control measure. Other methods tend to be variations of this approach such as the NEO-Personality Inventory (NEO-PI-R) (Costa and McCrae, 2008). The NEO-PI-R uses a five-factor model of personality (neuroticism, extraversion, openness, agreeableness and conscientiousness) about which a consensus emerged by the 1990s (cf., McCrae and Costa, 1990). Supporters of Eysenck's three-factor personality trait model of psychoticism, neuroticism and extraversion noted how this hegemony was not complete and Eysenck's model and questionnaire was still being widely used into the 21st century (Prendergrast, 1999). They also add that, unlike the five-factor model (Jackson, 2008) the model has a strong biological basis of these traits (Pervin, 1993) and in this way so they connect well with physiological theories of emotion. Genetic research has confirmed some of Eysenck's ideas of the hereditary nature of personality which supports subsequent genetic research into the inherited nature of personality[16] (cf., Heath et al, 1995). Whichever method is used, it must be taken into account that this relies on the individual knowing his/her personality which is not always the case.

c) Stimulants

Another factor that can affect emotional responses to audio-visual texts is the intake of stimulants such as alcohol[17], nicotine, controlled drugs and caffeine before the experiment. Alcohol is known to be used as a mediator (cf., Cooper et al, 1995) of emotions particularly

[15] Sybil Eysenck in 1981 published a summary of its use in 14 experiments, with over 15,000 subjects in 34 countries and several different languages and the reported internal consistency was no lower than 0.69 (cf., Furnham et al, 2008)

[16] There are many studies of separated twins that seems to confirm this including Keller et al's (2005) study of twins concluded that genetics were responsible for 40%-50% of personality traits.

[17] Tucker and Vuchinich (1983) showed alcohol reduced the effectiveness of emotional stimuli although Orozco, Wall and Ehlers (1999) considered the effects to be 'modest' (cited in Orozco, Wall and Ehlers, 1999: 13) especially for happiness responses.

used to cope with negative emotions such as anger (cf., Cooper et al, 1988). Kornreich et al's (2003) research on alcohol and opiate-based drugs users concluded that both drugs affect the recognition of a key emotional stimulus, faces, moreso the former. Caffeine, likewise, can affect performance in experiments as tasks are speeded up (cf., Battig et al, 1984).

d) Handedness

Cerebral lateralization, or the preference by the individual for processing information using sides of the brain will have an effect on the emotional viewing and responses to adverts. One way of testing this is by handedness, the preference for using the left or the right hand can indicate which part of the brain is dominant (Elias et al (1988) preferred footedness)

e) Other factors

There are many other factors that can affect emotional responses to adverts and they cannot all be realistically measured. This section discusses concentration on the text, sensory impairment, age, repeated viewing and gender as some of the control measures that could also be recorded.

One of the most important is concentration on the text which is vital (cf., Young, 2000) if the emotional stimuli are to be seen. Rolls (2007) might say that emotional stimuli will automatically be sought by the subject (or organism in his terms) as it is genetically programmed in use to seek negative or positive emotional stimuli. In particular, the emotional content in adverts tends to be positive stimuli: 'ad stimuli are generally pleasant stimuli' (Poels and Dewitte, 2008: 63) reception of which gives pleasure: 'an affectively positive…stimulus...acts operationally as a reward' (138). According to this bioinformational perspective (cf., Poels and Dewitte) the viewer is genetically programmed to seek such

stimuli. Nevertheless, the level of attention given to an advert will be a variable that can affect the outcome.

Another variable that can affect the type of text received is sensory impairments. Hearing impairment subjects, for example, have, 'great difficulties in identifying the speakers' moods' (Risberg, 1986: 79). Other factors which can affect the viewing of an advert include the previous text, Mattes and Cantor concluding that 'residual excitement from prior stimulation' (1982: 1) affects the emotional responses to adverts.

The age of the respondents may be a subject that can be measured and used as a control factor although at the age of seven most children can determine whether a text is an advertisement (Dorr 1986) but advertising literacy and its cognitive defences change with age (Livingstone and Helsper, 2006).

Another factor that can affect the outcome of tests into emotional responses to advert is the amount of times the individual has seen the text. Zajonc's 'mere exposure' hypothesis suggests that the repetition of stimuli such as music increases liking: 'more repeated exposure of the individual to a stimulus is a sufficient condition for the enhancement of his attitude toward it' (1992: 11). Bradley and Lang (2000) noticed how, when using their IAPS pictures, repeated exposure resulted in an orientation towards pleasant stimuli as they remembered the parts of the text they enjoyed. Repeated exposure will affect the subjects SEC responses as Scherer noted: 'unless a novel or unexpected stimulus is detected, the organism is likely to continue with its ongoing activity' (Scherer, 1987: 15). It might be expected, therefore, that over time the responses to the stimuli will decrease as the novelty of the situation and the types of images wears off.

The gender of the viewer may also act as an important control measures as unlike women: 'for men, little activity is found over the zygomatic muscle when viewing any pleasant content' (Bradley and Lang, 2007: 37). Meyers-Levy (1994) notes three ways males and females differ in terms of cortical organisation: men predominantly use right-hemisphere

functions (females left) and men perform more specialised functions. The former means that visual acuity and visual spatial processing are better in men. In women, there is greater verbal communication skill which means that each gender may respond with more attentiveness to different parts of the text.

3.4 Conclusions

This chapter has considered ways of assessing adverts for emotional content and responses. It has included the advantages and disadvantages of each method and examples of the usage. It has presented detail of two methods of assessing for emotional content: interviews and content analysis. There has been further detail on the key emotional stimuli that can act as 'significant' criteria for the content analysis. The methods of testing emotional responses to audio-visual texts have also been considered. Self-report and biofeedback have been the two major methods with discussion of alternatives. Finally, the chapter has considered some factors which can affect emotional responses.

The next chapter outlines a new methodology for testing the emotional content and responses to adverts based on methods outlined in this chapter.

CHAPTER FOUR

Qualities of Precognitive Stimuli in Adverts

Having established that emotion is two-component process with the potential for biological primacy (Chapter One), stated the importance of emotion to advertisers (Chapter Two) and ways in which emotional properties in adverts this could be studied (Chapter Three), this chapter examines (4.1) some precognitive stimuli which is difficult to measure followed by (4.2) three key stimuli – voices, music and face - which can be empirically measured. Following these sections (4.3) makes a case for testing the responses to these stimuli for cognitive as well as precognitive effects.

4.1 Stimuli in adverts that can affect precognitive emotional responses

There are many stimuli in adverts that can affect emotion. This section discusses four stimuli that can act in a precognitive manner: words, competition, laughter and colour - and some of the problems of trying to test their presence empirically.

Emotional words may elicit an emotional response as there is an argument that these, 'may be distinct from other abstract words' (Dewaele and Pavlenko, 2002: 263). Donohew (1981) using skin conductance response tests and self report on a mood scale highlighted active verbs and adjectives, direct quotes and a narrative style as arousing the affective system. As well as the prosodic qualities of the words being altered by emotion, 'imageability' the ability of a word to conjure a mental picture, helps to determine the 'affective information' (Wurm et al, 2001: 232). Bargh et al (1996) suggested there is a preconscious, pre-attentive priming of words that allows the individual to sense the urgency

of the words of the speaker but this may come more from prosody than meaning. By the very nature of words being symbolic signs the understanding must be learned and therefore cognitive but it may be possible that over time, the words become triggers for precognitive effects but this is an area understudied and the quantification of such words is problematic.

fMRI results show that competition activates the amygdala, winning the left hemisphere and winning the right (Zalla et al, 2000). This need not mean prizes given as the word, 'win', was used in an experiment by Zalla et al that showed 'significant' (Zalla et al, 2000: 1766) activation of the amygdala. Winning activates the left amygdala but putting words up like 'ok' does not have the same effect (Thut et al, 1997) suggesting that it is the element of competitiveness that stimulates the emotional system. Isens (1990) added that small gifts causes mild happiness. Of course, the wrong type of gift or music could have the opposite effect and Thorson's experiments showed that in advertising emotional intensity has its limits as 'too much emotional intensity is negative' (1991: 18) so it is a very difficult subject to consider. Furthermore, while the nature of reward and dopamine response may be precognitive, it may become a Pavlovian response which is learned as it also activates the contiguous hippocampal formation associated with learning and therefore the basal ganglia dopamine neurons which give us reward expectation (Zalla et al, 2000) the next time a similar activity is presented so subjects would differ greatly in the types of stimuli that might trigger a precognitive response.

Just as, 'sitcoms use canned laughter because it makes people laugh harder and longer' (Rhoads and Cialdini, 2002: 530) so laughter in an adverts should have the same effect. Forgas and Maglan (1970) concluded that 'happy noises' brought happiness. The processing of laughter was tested by an fMRI experiments (Osaka et al, 2003: 2003) showing how Japanese words for laughter which are onomatopoeic stimulate the visual cortex suggesting that the individual can see the laughing face from the sound alone and that this can bring similar facial contagion. Contagion of laughter can also occur bringing with it the

reward system of positive chemical responses. This is shown by the activation of the left anterior PM/SMA (Pre-Motor/Supplementary Motor Area). Osaka et al (2003) suggest that laughter and words which have an onomatopoeic laughter quality have a visual and reciprocal effect eliciting the reward mechanism of hedonic emotions. When shown 45 second blocks of men and women laughing the subjects of Sander et al's (2003) fMRI experiment showed activation of the right amygdala showing that it induces an emotional response. The evidence of laughter as a precognitive trigger is strong but the quantification method is difficult as it means defining what laughter is and to what extent a 'happy noise' is achieved.

There are 'few scientific studies of the effects of colour because of methodological problems inherent in this area of research' (Lichtle, 2007: 37). Colour, 'influences both evaluation-related affect (affective tone) and activation-related affect (arousal)' (Babin et al, 2003: 544). Arousal is most likely to occur at extremes of intensity and brightness, when the wavelengths are longest and shortest (Babin et al, 2003). Like sound, colour is a human interpretation of actual phenomena and might more accurately be called electromagnetic energy whose waves range in length and are perceived as colours by giving certain wavelengths general names. Colour can be empirically studied by these names or by being split into three variables: 'Color is the visual experience that can be described as having quantitatively specifiable dimensions of hue, saturation, and brightness' (Gage, 1999, cited in Vigeant, 2003: 88). Colour works in a precognitive way like faces and sound but as Schulman noted: 'our responses to a particular color family or shade is so subliminal that we're not quite sure why we react the way we do' (Schulman, 2003: 1). Croley concurs that this is not an area that is widely understood: 'while the psychological effects of color have received some attention in the consumer behavior literature…our knowledge of these effects is limited at best' (Crowley, 1993: 59). One of the reasons for this is the fact that colour is so much dependent on the light source that to identify the colour of an object is to do so merely in that degree of illumination as Vigeant wrote, 'Carefully chosen words to describe color

differences will be useless unless…viewing the color in the same light' (2003: 89). It may also be the case that only certain colours activate the autonomic nervous system particularly red which induces a galvanic skin response (Wilson, 1966). Crowley (1993) speculates that there may be a natural origin to associating green with safety as its wavelengths fall in the middle of the spectrum. Likewise, red (long) and violet (short), are on the two extremes of the human's perception of the electromagnetic spectrum and so, 'perhaps colors such as red and (to a lesser extent) blue engender higher activation during the processing of an advertising message' (Crowley, 1993: 68). The under-researched nature of colour and emotion and it being fleeting phenomenon, dependent on light, surface and the viewer means that this very powerful affective stimulus is difficult to test empirically. Also, while humans will mostly view wavelengths the same, it is estimated that one in twelve males have a form of colour blindness[18] further problematising the study.

4.2 Three measurable stimuli which can affect the individual in a precognitive manner

There are three stimuli for which there is strong evidence of precognitive effects and which have previous research and experiments into the criteria by which they can be measured: voice, music and face. This section will explain the nature of measuring these three stimuli: (i) voice (ii) music and (iii) face

i) Voice

The result of emotion may come out in lexis (choice of words) proxemics (position of words) etc. but as Budd argued, it is the way these words are spoken that has the real effect as it triggers the ancient human emotional system: 'The impassioned orator, bard or musician, when with his varied tones and cadences he excites the strongest emotions in his hearers,

[18] the occurrence is much less in women at 0.4% of the population (Scott, 2000: 74)

little suspects that he uses the same means by which his half-human ancestors long ago aroused each other's ardent passions, during their courtship and mating' (1985: 57). The choice and order of words are partly a conscious act and at the mercy of so many factors (person spoken to, situation etc) that the outcome of such factors is far removed from the original emotion felt.

It might be argued that there is the presumption by advertisers that a particular emotional quality of a voice will have a corresponding effect on the audience. This commonsense view is backed up by Heitanan, et al's EMG experiments showing that the face responds automatically and unconsciously to other words using different emotional expression: 'Hearing a vocal expression of anger increased the subjects brow region...in contrast the expression of contentment activated the periocular muscle region…these results are in line with previous results' (1998: 534). As Scherer noted, 'human vocal behavior communicates emotional states very effectively' (1982: 37) and so this is a good stimulus to study. Voice is also a good subject as there is evidence that it is biological and genetic in origin, as Juslin and Luakka state: 'human vocal expression of emotion is based on phylogenetically old parts of the brain that are in some respects similar to those of non-human primates' (Juslin and Luakka, 2003: 7).

Speech is one stimuli which can be measured in a systematic manner: "It is inconceivable that there could be information present in the speech signal that could be detected by the human auditory system but which is not accessible to acoustic analysis and phonetic categorisation" (2000: 1). Furthermore, the effects of speech patterns of speech correspond to emotions as these patterns are a result of the bodily changes caused by emotion; emotion affects the vocal tracts which affects the sound. As Cahn explains: 'Thus, with the arousal of the sympathetic nervous system – as with fear, anger or joy – heart rate and blood pressure increase, the mouth becomes dry and there are occasional muscle tremors. Speech is correspondingly loud, fast and enunciated, with strong high frequency energy'

(1990: 252). Further evidence of the precognitive nature of emotional expression and response was given by Scherer's cross-cultural study of recognition of emotions using eight nations including the UK, Indonesia and Spain[19] which concluded: 'vocal emotion expression may be at least in large part driven by universal psychobiologcal mechanisms' (Scherer, 2000: 4). This suggests that the ability to communicate emotion is something that is innate, as Juslin and Luakka argued: 'Human vocal expression of emotion is organized and initiated by evolved affect programs that are present in nonhuman primates' (Juslin and Luakka, 2003: 25). Hedonic signals, for example, will cause such responses inform the vocal tract to widen (faucal and phyryngeal expansion) and added to the widening of the nostrils to allow a pleasant stimulus in the voice becomes softer (Scherer, 1987: 29). Matsumoto and Yoo concurred: 'emotions appear() to share a more or less universal experiential base across cultures (2007: 334). The idea that emotional expression is innate is given further credence by Papousek who showed that 'investigations with newborn infants…show() that they are already able to decode simple emotional meanings from intonation patterns' (cited in Klasmeyer, 2000: 201).

One drawback of assessing speech in adverts is that voice-overs are just a facsimile of the actual emotion as it is acted speech. The encoder uses learned bodily responses to emotion or induces it in him/herself and this will affect the bodily responses but, 'acted speech is merely conforming to stereotypes of how people believe that emotions should be expressed in speech, not to how emotions actually are expressed.' (Gustafson-Capkova, 2001: 2). Nonetheless, as Campbell noted: 'Previous studies of emotional speech characteristics that are frequently cited…have often been based on recordings of actors simulating various emotions under studio conditions. To the extent that the intended emotions can usually be

[19] Scherer recorded sentences from each nation and exposed the nations to all of these sentences. The results had some variations for example there was only a 0.68 recognition on France of Indonesian expression but this was the worst as in every other case except for Indonesia and one example of Italy and UK the recognitions of each others' emotional expression was above eighty percent and even in the exceptions there were only two examples of recognition being less than seventy percent.

correctly identified by listeners afterwards, these recordings must be considered satisfactory' (2000: 34).

Another drawback is terms used to express prosody which can be imprecise and measures which differ between experimenters. Some experimenters reported findings in semitones rather than the more common hertz making direct comparison difficult. There is no agreement on the reporting of findings with some doing so diagrammatically and others nominally so again, direct comparison is difficult. Emotional speech is sometimes studied as a comparison feature so, for example, anger is louder than boredom but it is not clear against which base this judgement is made. There is also the problem of definition of words. For example, anger is sometimes divided into hot and cold the former having a 50% rise in speech rate while the latter a 20% rise (Burkhardt and Sendlemeier, 2000) while other experimenters use the one term 'anger'. The study of prosody is further complicated by consonants and vowels having their own frequencies regardless of emotional quality (Scherer, 1982). Prosody is used for meaning as well as emotional purposes and it is difficult to divorce the two. Understandably, some of the studies into emotion use a singular crierion, such as formant quality. Moziconacci noted how: 'Such crude measures must be expected to obscure a substantial part of the variation present in the speech material and do not provide any information concerning the linguistically relevant variation. Their frequent use is probably due to the fact that they are easy to obtain and that their common use facilitates comparison of results across studies' (1998: 4). A further issues complicating the study of prosody is that some features of speech that are used to assess emotion are not well understood, such as jitter of which the, 'exact nature and the significance of jitter are still not very well known (but), it is assumed that there is a relationship to emotional arousal' (Scherer, 1982: 156).

That emotional voices are indicated by a decrease or increase in mean pitch is one of the most commonly held conclusions. This signifier alone cannot be used (or made sense of)

in isolation as anger and a range of emotional states result in a higher pitch but taken with other factors will be a good and reliable piece of evidence. A second feature of emotional speech, declination is common in most sentences but will vary in pitch fall according to emotion. Many theorists (cf., Owrens and Bochorowski, 2007; Scherer, 1987, Cahn, 1983) agree that emotions are characterised by a third feature, an increase or decrease in stressed syllables. A fourth feature of emotional speech is the position of the 'nucleus' - the, 'pitch accent which stands out as the most prominent in an intonation group' (Cruttenden, 1986: 49). Fifthly, pitch range expresses emotion as while English is spoken in tone groups with short bursts of linked words which rise up to the nuclear or head tone and then declination until another tone group (Cowie et al, 2001) the speaker will increase or decrease the stress on the nuclear tone to express emotion. A sixth feature of emotional speech is formant pitch. The assessment of prosodic qualities of speech is summarised by Cahn: 'Fo and timing… are the main conveyers of affect' (Cahn, 1990: 3). Fundamental frequency (Fo) is the speed of vocal cord vibration (Owren and Bochorowski, 2007). Formants are numbered from low to high, F1, F2 etc and allow an assessment of vowel quality[20]. Fo of phonemes carry emotional significance, however, some phonemes will not have a Fo as they are 'voiceless consonants' and it will tend to be the vowels that will carry the most important pitch information (Cruttenden, 1986: 4). The seventh attribute of speech that can be assessed empirically is jitter or, 'irregularity in the vibration of the vocal fold' (Scherer, 1982: 156) which can be a result of muscle tension caused by emotion. Finally, the speed of speech is, 'of primary importance for conveying emotion in speech' (Mozziconacci and Hermes, 2000: 1) therefore, speech pace is performed in most acoustic analyses of audio-visual texts (Owrens and Bochorowski, 2007). Speech rate is most commonly measured by, 'the duration of each word is measured and divided by its number of constituent phonemes to produce a measure

[20] F1 is around 500 cycles per second or hertz (Hz) and F2 around 1,780 Hz. There are other formants (F3, F4, F5 etc) but these are not so important to judge expression and are mainly affected by the quality of the voice (O'Connor, 1973: 87).

of overall speech rate by condition' (Owren and Bochorowski, 2007: 240) but phonemes can be silent and vary so much in terms of length that syllables (which have to be spoken by their nature of affecting the rhythm) are a better measure and, as Owrens and Bochorowski noted, 'when characterizing speech rate, syllable-counting is arguably the most straightforward approach' (2007: 250).

ii) Music

There is, 'wide acceptance that musical stimuli are among the most powerful triggers of strong emotions' (Rickard, 2004: 371) indeed that, 'The reason most of us take part in musical activity...is that music is capable of arousing in us deep and significant emotions' (Tarasti, 1994: 1). There is a belief that music, like speech is innate, or in Peretz and Zatorre's term, 'hard-wired' which is: 'functioning at birth, determined by genes, independent of environmental influence and experience' (Peretz and Zatorre, 2004: 2). As with the expression of emotion through voice, music acts from and reacts to[21] emotion while 'listeners can be "moved" by music performances through a process of emotional contagion' (Juslin and Luakka, 2003: 26).

While cognitively, humans separate voice and music it might be argued that they operate on a precognitive level in the same way. In fact, there is a 'close relationship' (Juslin and Luakka, 2003: 2) between them and the way they operate on an emotional level. This is because, 'Sound, as such, does not really exist in the world around us. What does exist is vibration' (Booth-Davies, 1978: 26) and it is the presence and then effect of the vibration on the precognitive system that may be tested. Music is a term given to particular sounds. The

[21] There are ways of looking at this. One is that music is a symbolic representation of emotions – an iconic form of internal feeling. The other is that it is 'composed, performed (and)…listened to' (Juslin and Sloboda, 2001: i) through the emotions. Bouwsman expressed agreement with the latter view thus: 'The sadness is to the music rather like the redness is to the apple, than it is like the burp to the cider' (Bouwsman, 1950 cited in Juslin and Sloboda, 2001: 37). However, as with so much in the study of emotions, the area is so wide and subject so non-specific that there is no reason why both of these perspectives cannot be true: music both denotes and expresses emotion.

typical features include having a low frequency rate - the upper limit seeming to be 5,000 hertz (cycles per second) when humans have an upper limit of 16,000 hertz and the lower limit of 19 hertz (Booth-Davies, 1978: 35) but, '75-150Hz are reasonable limits for adult male speech and 150-300Hz are appropriate if talkers are adult females' (Owrens and Bochorowoski, 2007: 254). In addition, music should be located to one area and not too loud (certainly not above 130 decibels). In music, sounds are related belonging to frequencies that are multipliable – 'integral multiples' (Booth-Davies, 1978: 31) - of the fundamental or prime note. For example, a note at 100 hertz should be accompanied by one at 200, 300 or 400 hertz etc. to be sound balanced. Music also has a sequence which we can organise and in this way is ephemeral (Booth-Davies, 1978: 60) as it is expected to change and end. These phenomena differentiate music from other sounds. Music is sound organised and received, 'largely…for the purpose of mood – and emotion-optimization' (Sloboda, 1999: 1).

There is something, 'primitive and innate' (Sloboda, 1999: 154) about the way sounds are grouped using, 'focal attention.. (which) can only be in one place at a time' (Sloboda, 1999: 171). The 'ear's mind' (Sloboda, 1999: 172) darts around putting similar sounds together. Music stimulates emotions in many ways and how it does this and specifically which sounds can trigger which emotions can be known, as Booth-Davies stated, 'musical cognitions are not metaphysical or magical…(but) are...underpinned by physiological processes which may one day be capable of explanation' (1978: 17). Music is a precognitive trigger of emotion. There must be something biological and pre-wired (Jurgens at al, 2000) about responses to sounds, as evidenced by the fact that five-day-old babies are calmed by low tones and physically moved (for example, an increased heartbeat) by different tones (Birns et al, 1992). Indeed, Fernald (1989) studied how people talk to babies and concluded, 'that when it comes to communicating emotion through infant-directed speech, the melody is the message' (Nawrot, 2003: 77).

Perhaps music and vocal expression are connected. Spencer in his, 'Origin and Function of Music' in 1857 thought so, explaining how emotions cause physiological changes which, in turn, alter the acoustic characteristics of singing and speaking (Juslin and Laukka, 2003: 2). This, Spencer's Law was an early and convincing attempt to explain how both voice and music (which could be termed a 'superexpressive voice' (Juslin and Laukka, 2003: 7)) contain emotion. Perhaps this is why music, like voice, can trigger precognitive emotional effects, as Juslin expresses: 'There is a large amount of evidence that people easily 'catch' the emotions of others when watching their facial expressions or hearing their vocal expressions, presumably through some sort of 'motor mimicry'. The fact that certain aspects of emotional expression in music are highly similar to vocal expression of emotion suggests that we get emotionally aroused by the voice-like aspects of musical performances' (Juslin, 2001: 329). Musicians echo or encode the sounds of speech into their instruments. The decoder listens for, among other things, intrinsic pleasantness, goal significance, coping potential and self-compatibility (Scherer cited in Juslin and Laukka, 2003: 7) performing a Stimulus Evaluation Check on all of these which affects the physiological system. It could be seen that, 'The basic 'phoneme' of music is a 'note'. Like a phoneme a note is characterized by frequency and duration parameters' (Sloboda, 1999: 24). There is also work in finding a common or 'Chomskyan' grammar to music[22] matching the earlier work by Heinrich Schenker (1868-1935) who believed that, 'at a deep level, all good musical compositions have the same type of structure (which)…reveals to us something about musical intuition' (Sloboda, 1999: 12).

Music, then, works in a precognitive way and the individual when presented with an advert which stimulates the primitive affective system is aware that this has happened only in the sense that s/he feels differently and then is more inclined to think differently about the

[22] Continuing from Heinrich Schenker's early identifying an Ursatz, a deep structure to all music composing of the Urlinie (melody line) and Brassbrechung (bass line) theorists have attempted to identify what is about music that is, '*characteristic* of the human species…*universal* to all humans and *specific* to humans' (Sloboda, 1999:.17).

object which holds the stimulus, as Sloboda and Juslin expressed: 'A person can be reduced to tears by a particular passage of music, yet be completely unable to specify, even in outline, any objective feature of the music which would account for its grief inducing properties' (2001: 85). Peretz noted how musical stimuli can affect us even against our own wishes by noting her own response to a musical (Mrs Butterfly) which she found 'boring and caricatural' but ended up in tears at noting how: 'my disliking was probably a cultural response, whereas my emotional reaction was a biological reflex' (2001: 126). Many such anecdotal experiences have been confirmed by experiments including fMRI equipment which examines the pathways of neurons showing how emotions are precognitive systems that can be triggered as well as more developed cognitive responses, as LeDoux expressed: 'Emotions evolved not as conscious feelings, linguistically differentiated or otherwise, but as brain states and bodily responses. The brain states and bodily responses are the fundamental facts of an emotion and the conscious feelings are the frills that have added icing to the emotional cake' (cited in Kovescses, 2000: xi)

Responses to these emotionally-expressive sounds are 'transcultural' (Sloboda, 1999: 1) partly evidenced by the 'fundamental human attraction' (Sloboda, 1999: 1) all cultures have to music. There are cross-cultural connections to music, such as fixed intervals and a sense of a common octave (Revesz, 1953). As with language, music has a phonology - the basic phoneme being the note (Sloboda, 1999: 24) and an ordering system (syntax), the scale. Scales are not universal (Sloboda, 1999: 24) but there does seem to be a generative system to all cultures as one musical phrase gets its meaning from the preceding ones and the need to repeat a phrase. A tonic chord will start a piece off and notes will harmonise in whatever scale is chosen, producing a 'regular pulse' (Sloboda, 1999: 47) where a stress can be heard from a note's duration or pitch[23].

[23] Perhaps it is connected by our also human need for the story, after all, it too starts in a key, establishes a pattern which gets disturbed, repeats motifs until it rests in the original key and often note. Tarasti comments

One problem with studying music is how to classify the features which cause emotion. Even some specific emotions linked to specific musical features can be very difficult to test for such as Cook's (1954) 'spiritless anguish' from a minor second or 'pleasurable longing' from a minor second to tonic as the features may be identified but the nature of the emotional response difficult to define or for the viewer to express. Another problem with testing measurable features of music is that they affect each other, as music is experienced in genres, keys and patterns which leads to expectations, the breaking of which arouses (Meyer, 1956). Much of the empirical research into emotional music assesses short bursts of between two and twenty notes (cf., Sloboda, 1999) which does not see the way music builds up into patterns and can give a misleading reading of the piece as a whole. Another problem of testing music empirically are that most studies are on arousal rather than type of emotion (cf., Bartlett, 1996) and 'few physiological studies have investigated the valence dimension of musically induced emotions' (Juslin, 2008: 64). Testing musical stimuli empirically is further problematised by the amount and variability of criteria that can be judged - Juslin (2000) listed tone attacks, articulation, timbre, accent, duration, sound level and vibrato among the more common features such as pitch and speed. Added to this is the difficulty of measurement of such features as timbre.

Attributes of music which may be tested empirically include: (i) speed of notes (cf., Gabrielson, 1995) (ii) similarity of note length (cf., Juslin and Luakka, 2003) (iii) variability of pitch (cf., Hevner, 1937) (iv) key (cf., Booth-Davies, 1978) (v) and (vi) rising/falling pitch (cf., Rapoport, 1996).

iii) Face

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that in music as in the story, 'every tone heard after the first puts the balance of work in question and creates a demand for the return of that balance' (Tarasti, 1994: p.8). Like narrative, music is also temporal (Tarasti, 1994: 24) and takes the listener on a journey of emotion: 'music in particular is a temporal continuum of several passions' (Tarasti, 1994: 73).

The measurement of emotional faces may be done by using judges (Doherty, 1988) to label emotional expressions or by caricaturing the emotional expressions to test intensity (Calder et al, 2000) but the most common method is by the use of Ekman and Friesen's Facial Action Coding System (FACS). Example of use of this method are by Peper and Karcher (2001) and Hess and Blairy (2001). In FACS major muscle face movements are labelled Action Units (AU - 'the smallest visually discriminable facial movements' (Cohn et al, 2007: 203)) and there are common movements to emotions, for example, 'all four happiness expressions contained AU12…accompanied by the AU6' (Hess and Blairy, 1998: 5). Thus, the task of identifying a happy face can be simplified down to that of quantifying the amount of two muscle movements – AU6 and AU12, respectively the lip corner pull using the zygomaticus major muscle and the cheek raiser using the obicularis occuli, pars laterelis[24]. The researcher codes (Cohn et al, 2007) cues which represent emotion. Happiness is AU6 and AU12, in faces on the screen.

The facial responses in the advert should be matched by the viewers and this can be measured. This 'primitive' (Hatfield, 1992 cited in Wild et al, 2000: 109) response is both automatic and, 'mostly unconscious' (Wild et al: 2000: 109). Primitive emotional contagion occurs because there is a, 'tendency to automatically mimic expressions' (Hsee et al cited in Wild et al, 2000: 110) or to put it more poetically, we 'catch' (Doherty, 1998: 187) the emotions of others. Mimicry of expression should not necessarily mean mimicry of emotion, however, Hatfield et al (1994) suggest that the, 'afferent feedback generated by mimicry produce(s) a matching emotional experience' (Doherty, 1998: 191). This is similar to the facial feedback theory of the James-Lange school. fMRI analysis has helped to reveal the neurological pathways of facial feedback. In particular, the Wellcombe Department of Neurology has identified the amygdala at the centre of this process receiving input from the

[24] Added to these can be AU25 and AU26 which both open the mouth to widen the smile. The original FACS (1978) did not include intensity of emotion but FACS (2002) included an additional letter scheme of A-E. However, 'guidelines for intensity coding are somewhat subjective' (Cohn et al, 2007: 211) and are deemed to be an unnecessary complication to this method.

olfactory bulb, the nucleus of solitary tract, the parabrachial nuclei, the anterior temporal lobe and the pulvinar and medial geniculate nucleus (Morris et al, 1998: 47) in response to faces. As well as fMRI, experimenters have used Electroencophalogram (EEG), EMG and self-report to show facial feedback. They all show a 'sympathetic dermal and cardiovascular reaction() in the viewer' (Wild et al, 2000: 110). Moreover, the type of emotion affects the response. Aside from altering emotional states, photos of emotionally expressive faces have been shown to have a number of unconscious processes eliciting sympathetic dermal and cardiovascular reactions in the viewer (Wild et al, 2000: 3).

4.3 The need to use self-report along with biofeedback testing

There is understandable debate as to whether precognitive responses to stimuli are actually 'emotion' – some giving the term 'proto-emotion' to responses to stimuli such as music (Sloboda and Juslin, 2001: 97). The physiological responses stimulated by such triggers as voice, music and face are better perhaps seen as antecedents of emotion, they signal that the stimulus is important to the audience of an audio-visual text and also how it should be perceived. Ekman noted how these alone are not emotion: 'nearly all emotion theorists agree that emotion incorporates phenomenological experience, a distinctive expression in the face and/or voice, cognitive appraisal, physiological activation, and some form of coping…the presence of one of these elements is not sufficient to establish that an emotion has occurred' (2007: 48). The precognitive responses may be seen as only part of what might be termed 'emotion'.

In view of this, it is necessary when studying emotional response to consider the cognitive responses of subjects to precognitive effects as, 'emotion (is)…a heuristic process, going on very rapidly and largely below conscious awareness (but)…meaning

(is)…something that resides at the level of the individual viewer' (Newhagen, 2002: 731). In other words, adverts, 'do not contain meaning; they evoke it' (Newhagen. 2003: 731). These two processes, emotion and meaning are connected, as Dillard and Anneloes expressed: 'Western culture often portrays the relationship between affect and cognition as one of antagonism…In fact, there is substantial evidence that these two processes generally go hand-in-hand' (2002: 317). Hand-in-hand is a useful metaphor as the cognitive responses will be affected by all of the, what Krugman (1977) termed, 'pre-attentive processing' (cited in Newhagen, 2002: 753) that includes emotional responses. The two work together, in a two-process manner with the precognitive responses informing the subject not only of the existence of an important stimulus but how it may be responded to. For example, hedonic faces result in facial contagion which can then act in a more, 'sophisticated, cognitive process of empathy' (Doherty, 1998: 188). Therefore, the precognitive responses may lead to a more fulfilling emotional experience when: 'the afferent feedback generated…produce(s) a matching emotional experience' (Doherty, 1998: 191).

Some theorists such as LeDoux and Zajonc labeled the two emotional responses lower and higher order emotions for precognitive and cognitive respectively. Others called them Type 1 and Type 2 (Poels and Dewitte, 2006: 19) both suggesting they are linked but differentiated. Frijda differentiated the two types as 'feelings' and 'emotions' the former being, 'concomitants of stimulus reception and imply mere acceptance or non-acceptance of the stimulus' (Goossens, 2000: 311) and the latter being a result of evaluation of the experience according to whether it meets the organism's needs. Whichever term is used the self-report can test the connection between the two levels of emotional response.

Conclusions

This chapter has examined stimuli which can affect emotions in a precognitive manner in adverts. It has considered words, laughter, colour and competition as possibilities to study but stated that there are problems to doing so empirically. Three stimuli which are widely studied in an empirical manner are voice, music and face and while not free from complication, it is possible to define and find their attributes in adverts. The chapter ended with stating that precognitive responses are only part of emotion and so it is important to also study cognitive responses to these stimuli.

CHAPTER FIVE

A New Method for Testing the Emotional Content and Effects of Adverts

Chapter One contained a definition of 'emotion' and considered the complexity of the subject and argued that in some cases a biological emotional response preceded a cognitive one. It made a case for studying both the biological and cognitive responses to adverts. Chapter Two looked at why emotion is used in adverts and argued for the importance of studying the subject. In Chapter Three, methods used to test emotion in adverts including interview, content analysis, self-report and biofeedback tests were explored. Chapter Four gave description of some of the stimuli in adverts that can affect the viewer in a precognitive manner and concluded that three stimuli (voice, music and face) could be empirically measured.

This chapter proposes a new method of testing adverts for emotional stimuli. It is a unique method which tests for the presence of three precognitive stimuli in adverts and the responses in an empirical manner using a semi-automatic procedure. Improvements in biofeedback technology have meant that this has become a more accessible field (cf., Bradley and Lang, 2000) making this method possible. The method is unique in that it concentrates on three precognitive stimuli – voices, music and face – and measures their presence and effects. The testing of the presence of these stimuli has been done separately (cf., Cahn, 1983; Booth-Davies, 1978) but not for all three measures together. There have been empirical studies of the effects of precognitive stimuli (cf., Orozco and Ehlers, 1998; Peper and Karcher, 2001) but this has not been done for both content and effect together. This method is unique in that it tests adverts when often responses to precognitive stimuli are tested for single images or noises (cf., Teft, 1975; Pallmeyer et al, 1986). It is also unique in that it allows the assessment of a range of emotions.

This chapter outlines the new way of testing adverts proposed by this thesis. It starts with (5.1) the need to pre-assess the likely emotional responses in the viewer by interviewing encoders of adverts. Following this, (5.2) explains the process of content analysis for the three stimuli – voice, music and faces. The next sections (5.3) explain the process of testing emotional responses by biofeedback response and (5.4) self-report methods followed by (5.5) how the data from these experiments can be analysed. Finally, there is a consideration of (5.6) ethical issues of this method.

5.1 The need to pre-assess the likely emotional responses in the viewer by interviewing encoders of adverts

It is important to establish a likely emotion before a content analysis. This section explains why and argues that one way of doing this is to interview the encoders of an advert or a genre of adverts.

Because, 'neural systems appear specialized for the recognition of specific emotions' (Peretz, 2001: 110) it is necessary to know the emotion before testing for it. As New et al explain, when testing for many emotions using analysis of speech quality results in confused data: 'the performance of systems employing these features degrades substantially when more than two categories of emotion are to be classified' (New et al, 2003: 603) so finding an intended emotion simplifies the procedure.

One way of discovering the emotion in an advert is to ask the encoder. The subject of emotion and adverts fulfils the circumstances in which the interview process is desirable (cf., Gillham, 2000: 11): small numbers are involved; people are accessible; most of the questions are open and require prompts; the material is sensitive and trust is involved; anonymity is not an issue; the depth of meaning is central and the research aims require insight and understanding. Interviews form part of a 'systematic research technique' (Hayes, 2000: 126).

In order to fulfil this definition the interview should be completed in four stages (Gillham, 2000: 35): (i) introductory which starts before the interview, the interviewee needs to know why they have been asked, information needed, length of interview, where and when it will be: (ii) opening development beginning by explaining purpose of interview; (iii) central core and (iv) bring to a close – pulling together content, leave good impression, write a letter of thanks. The interviews should be recorded with prior permission from the interviewee, the data collated and transcribed because as Gillham noted, 'you can't really study an interview except in complete written form' (2000: 62). In order to be systematic, there must be a structure of questions but: 'expert interviewers always have a structure, which they use flexibly according to what emerges' (Gillham, 2000: 3). A totally structured interview is not only very rare, it can achieve wooden responses as it creates an even more artificial environment than the interview already is so a semi-structured interview is favoured by most psychologists (cf., Hayes, 2000). In this type of interview there is a specific set of questions which are phased to allow open responses while some closed questions allow quantification. Semi-structured interviews give detailed information, allowing human response but responses can be cross-referenced between responses. There are six types of interview according to Hayes (2000) but the one which most suits the purposes of discovering emotional intentions is the depth interview which has a 'high level of rapport and trust is established to explore views and motivation of the interviewee' (2000: 114).

In light of the suspicion of emotion (cf., Oatley and Jenkins, 1996) the subject of emotions should not be addressed directly at the start but the interviewee should discuss her/his views of the adverts should the subject of emotion appear naturally then this could be explored further. Later in the interview more explicit questions about emotion may be asked. It is vital with a sensitive subject matter, such as emotion, to establish trust: 'it...is remarkable what people will disclose if they feel you are a person they can talk to' (Gillham, 2000: 16). An introductory letter on headed paper should be sent, followed by emails and phone calls

prior to the interview. These mean the interviewee would know the interviewer was serious about the subject and organised. While in the interview, body language is important and something that an interviewer must develop as, 'people are extremely good at reading non-verbal signals' (Hayes, 2000: 114). Non-verbal issues to be aware of during interviews include: facial expression, as 'the face is the main communicator' (Gillham, 2000: 31) so the signals must be appropriate and responsive; eyes, as 'the eyes are the most communicative part of the face' (Gillham, 2000: 31) and should signal interest and the expectation of an answer; proximity, following Gillham's suggestion of 4-6 feet away which shows interest but is not uncomfortable and an orientation of ninety degrees which is less authoritarian.

Being relaxed is important, as Hayes noted: 'people respond to one another as human beings, and we react completely differently to someone who is unable to act spontaneously than we do to someone who is relaxed and open' (2000: 121). Other interview skills to be used include: 'reflecting' by repeating to the person what they have said; 'amplifying' by taking what someone has said and broadening its significance to make it clear; non-verbal signalling especially with strong eye contact (though care must be taken so as not to bias such as with smiling or nodding of the head); 'probing' by asking additional questions to clarify and 'prompting', reminding of points not mentioned.

The difference between interviewer and interviewee is a factor to be aware of as, 'people adjust their responses according to what they consider is appropriate for the person asking the question' (Hayes, 2000: 115). Gender, race, age differences can affect the responses as the interviewer will always remain constant this is a factor to be aware of and mention if it seems to have altered the data gained. Listening is also a vital skill of interviewing: 'becoming a listener rather than a talker is the biggest single problem in interview training' (Gillham, 2000: 33). Learning to listen is vital as well as, 'appreciat(ing)...the active role of silence' (Gillham, 2000: 35).

5.2 Content analysis

The last section explained an interview process to be followed when trying to find the likely emotional content in adverts from the encoders. This section outlines and explains a method of testing audio-visual texts in an empirical way for emotional content.

The content analysis follows Cottle's (1998) stages for content analysis: (1) formulate problem of hypothesis; (2) define population; (3) sample; (4) select and define a unit of analysis; (5) construct categories of content to be analysed; (6) establish a quantification system; (7) train coders and do a pilot system

1. Formulate hypothesis

A sense of purpose must be in place before the other stages begin as Riffe et al stated: 'content analysts…typically do not collect descriptive data and then ask questions. Instead, they conduct research to answer questions' (2005: 35). Having established a likely emotional content and desired effect from the adverts through the interviews, the hypothesis should be that the adverts will contain the expected attributes of speech, music and faces for this emotion and that there will be a corresponding effect.

2. Define population

Deacon et al (1999: 118) stated that the first stage of a content analysis is to define the total range of content about which inferences are to be made. Holsti concurred: 'the first step in sampling is to list all members of the class of documents about which generalizations are to be made' (Holsti, 1969: 128) and for this method, it will be a range of adverts, whether that be by brand or campaign or possibly a genre of adverts This may lead to an unworkable population which will then need to be sampled.

3. Sample

As Riffe et al (2005) noted, in an ideal world all relevant content would be included meaning but because of the detail needed in this method of content analysis of adverts it is necessary to limit a sample down to a manageable level. As Holsti noted, 'the initial impetus for sampling may be the very practical requirement of reducing the volume of data to manageable proportions' (1969: 128). Using Hansen's (1996) list of sampling criteria, it is advisable to do so by geography, date, format, genre and accessibility.

The internet has threatened older definitions of media texts[25] redundant such as an 'advert', a 'newspaper' or 'television' as so much has merged (the newspaper article is an advertorial, the images move making it television etc). Therefore, a definition of 'advert' must remain broad – any audio-visual text which is designed to sell. These are available in several ways, CD/DVD, television and on websites being some of the sources.

Having identified a universe of texts it is necessary to further sample the amount of the text to be analysed. While Wimmer and Dominick (1997) suggest 10-25% of the body of content and Kaid and Wadsworth 5-7% (cited in Riffe et al 2005: 143) so there is no agreement on this and it depends on the nature of the text to be considered. There is, though, a case for not having an audio-visual sample of more than a minute (cf., Hsee et al, 1995) as emotions get 'blocked' (Wild et al, 2001: 112). Fischer et al's fMRI study, for example, reported a, 'decrement of brain responses to repeated stimulus...repeated stimulus loses its signal value' (2003: 394) and therefore their experiments into the electrical subcortical activity recorded an, 'observed…habituation or extinction of the conditioned response' (Fischer et al, 2003: 394). Also, as, 'most investigators have identified a late positive going component that peaks between 300 and 600msec…depending on the affective stimulus'

[25] Holsti recognised that even when the concept of 'media' was a less fluid concept it was, 'not always possible to prepare such a list' (1969: 129).

(Orozco and Ehlers, 1998: 282 [26]; cf., Johnston et al, 1986) there is a good argument for keeping the adverts short and specific so this speed can be assessed. This is especially so as the listeners need little time to distinguish the emotional quality of stimuli such as music: 'listeners need less than a quarter of a second…to reliably distinguish the tone of the whole musical excerpt as happy or sad' (Peretz, 2001: 118). Biocca noted that, an 'eon' of processing goes on in a 30-second commercial (cited in Newhagen, 2002: 731) and the viewer's capacity to assess meaning and emotion should not be underestimated.

4. Select and define a unit of analysis

In the case of this method, the 'content unit' is each individual advert and the study units, the phenomena identified as having a precognitive emotional response. Deacon et al wrote a note of caution about content analysis: 'content analysis is not an exploratory method; it only gives answers to the questions you ask. So you must make sure you ask the right questions' (1999: 121). It is worthwhile repeating the mantra: 'never count things simply for the sake of it' (Deacon et al, 1999: 121).

The chosen units of analysis in this method fulfil Holsti's (1969) five requirements: reflecting the purpose of the research (they are emotionally stimulating); mutually exclusive (an advert contains or does not contain the identified stimulus); exhaustive (all relevant recording units fit into a sub-category); independent (as each recording unit is placed in a sub-category regardless of any other stimuli present) and using a single classification principle (there is only one level of analysis – that of the three emotional cues in the adverts).

[26] Barret and Rugg's (1999) tests on emotional autonomic response times varied from 200-550 milliseconds suggesting that the type of stimulus affects the speed.

5. Construct categories of content to be analysed

Although often a content analysis, 'describe(s) the attributes of messages, without reference to either the intentions (encoding process) of the sender or the effect of the message upon those to whom it is directed (decoding process)' (Holsti, 1969: 27) in this method, the selected phenomena have been identified as having an emotional effect. This has meant taking, in Cottle's (1998) words, what is 'significant' beforehand and identifying the methods that researchers have shown through experiment elicit an emotional effect. As Sumner (1979) wrote: 'it is not the significance of repetition that is important but rather the repetition of significance' (cited in Hansen, 1996: 129). This method acknowledges the words of Hansen: 'content analysis…could never be objective in a 'value-free' sense of the word: content analysis does not analyse everything there is to analyse in a text (no method could, nor would there be any purpose in trying) – instead the content analyst starts by delineating certain dimensions or aspects of text for analysis, and in so doing he/she is of course making a choice – subjective, albeit generally informed by the theoretical framework and ideas which circumscribes his/her research - and indicating that the dimensions chosen for analysis are the important/significant aspects to look at' (1996: 128). As Hansen dryly noted: 'counting the insignificant has little purpose' (1996: 129). This conforms to Holsti's view that a content analysis should not be a 'fishing expedition' (1969: 27).

In selecting the categories for this content analysis, only those features which could provide quantifiable evidence have been selected - as Riffe et al noted: 'the analyst's decision on what represents appropriate and meaningful communication for content analysis must be based on the research task and specified clearly and without ambiguity' (2005: 29). Holsti noted how categories must 'reflect the investigator's research question' (1969: 95) and in this case it is stimuli which can effect an emotional response, namely, (a) voice (b) music and (c) face.

a) Voice

The criteria chosen for analysing emotional speech is adapted from several sources. Table Nine shows the significant criteria which can be looked for in the voice-over of an advert, archetypal emotions and the features which are indicative of them. The method of testing voice for emotional quality is adapted from the work of Burkhardt and Sendlmeier (2000), Moziconacci and Hermes (1999), Scherer (1987) and Cahn (1983) among others. These researchers tested speech for a variety of emotions, using different speech attributes. This method collates their work and finds common results and uses them to test the voice-over of adverts for emotional quality.

Speech feature	Researcher(s)	Date	Happy	Fearful	Sad	Anger	Boredom	Surprise	Disgust
i. Mean pitch	Burkhardt and Sendlmeier	2000	+50%	+150%	-20%	+20%	-20%		
	Fonagy cited in Nwe et al, 2003	1978	Higher			Higher			
	Van Bezooijen cited in Nwe et al, 2003	1984	Higher			Higher			
	Mozziconacci and Hermes	1999	Pitch mean 155Hz						
	Scherer	1987	Higher	Higher	Lower				
	Iida et al	2000	149Hz (M) 242Hz(F)		124Hz(M) 242Hz (F)	154Hz (M) 262Hz (F)			
	Cahn	1983	-30%	+100%	0	-50%		0	0
	Murray and Arnott cited in Nwe et al, 2003 and Cowie et al, 2001	1993	Much higher pitch average	Very much higher	Slightly slower	Very much higher		Lower	Very much lower
ii.Declination	Paeschke and Sendlmeier	2000	+100%(start) +400% (end)	+30% (start) +100% (end)	-10% (start) +200% (end)	+100% (start) +400% (end)	-80% (start) +80% (end)		
iii.Stressed words	Burkhardt and Sendlmeier	2000	+200%			+50%			
	Cahn	1983	+50%	+100%	+50%	+50%		0	
iv. Nucleus position	Cahn	1983	Later				Earlier		
v.Pitch range	Cahn	1983	+100%	+100%	-50%	+100%		+80%	+30%
	Burkhardt and Sendlmeier	2000	+100%	+20%		+200%	-50%		
	Scherer	1987	Increase in pitch range						
	Murray and Arnott cited in Nwe et al, 2003 and Cowie et al, 2001	1993	Much wider	Much wider	Slightly lower	Much wider		Wider	Slightly wider
vi.Formant pitch	Scherer and Pittam	1993	Higher	Higher	Lower	Higher			
	Burkhardt and Sendlmeier	2000	+30% (F1 and F2)						
	Kienast and Sendlmeier	2000	Slightly higher (vowels)	Very much higher	Much higher	Very much higher	Much higher		
Jitter	Janet E Cahn	1983	+100%		+100%	+30%			+100%
vii.Jitter	Burkhardt and Sendlmeier	2000	+30%	+30%	-40%		-20%		
viii.Speech pace	Janet E Cahn	1983	+20%		-10%	+80%		+40%	-30%
	Scherer	1987	Faster	Faster	Slower				
	Mozziconacci and Hermes	2000	+20%	+10%	-20%	+30%	-30%		
	Murray and Arnott	1993	Faster	Much faster	Slightly slower	Slightly faster		Faster	Very much faster
	Burkhardt and Sendlmeier	2000	-20%	+30%	-40%	+30%	-20%		

Table Nine: features of speech that indicate emotions

b) Music

Having explained the attributes of voice that will be included in the coding schedule the same is done for music.

The method of testing adverts for the emotional quality of music is adapted from Pampalk (2001) who measured the emotional properties of music by 'psychoacoustic properties' (MacDorman, 2007: 284). Pampalk took 5-second samples of music and measured the Modulation Fluctuation Strength of pitch, bass and beats per minute. These cues are part of the performance cues which, 'contribute independently - in an additive fashion - to listeners' emotional judgments' (Juslin, 2001: 325). Table Ten shows the musical criteria which may be considered to be emotional, seven archetypal emotions and the features which are indicative of them.

Music feature	**Theorist(s)**	**Date**	**Happy**	**Fearful**	**Sad**	**Anger**	**Boredom**	**Surprise**	**Disgust**
i. Speed of Notes	Juslin and Luakka	2003	Fast		Slow	Fast	Slow		
	Gabrielsson	1995	Fast		Slow				
	Hevner	1937	Fast		Slow				
	Gabrielsson and Lindstrom	2001	Fast	Fast	Slow	Fast	Slow	Fast	Slow
	Adachi and Trehub	2000	Fast	Fast	Slow	Fast			
ii.Note length	Juslin and Luakka	2003	Fast	Fast	Slow	Fast	Slow		
iii. Pitch range	Juslin and Luakka	2003	Wide	Wide	Narrow	Wide	Narrow		
	Gabrielsson and Lindstrom	2001	Wide	Wide	Narrow	Narrow	Narrow		Narrow
	Hevner	1937	High		Low				
iv. Key	Booth-Davies	1978	Major	Minor	Minor	Minor		Minor	Minor
	Cook	1954	Major		Minor				
	Gabrielsson and Lindstrom	2001	Major		Minor	Minor			Minor
	Hevner	1937	Major		Minor				
v. Sequences	Cook	1954	Rising	Rising	Falling	Rising	Falling		
	Gabrielsson and Lindstrom	2001	Rising	Rising	Falling	Rising			
	Hevner	1937	Rising	Rising	Falling				
vi. Pitch direction	Juslin and Luakka	2003	Rising	Rising	Falling	Rising	Falling		
	Gabriel and Lindstrom,)	1978	Rising	Rising	Falling	Rising	Falling		
	Rapoport	1996	Rising	Rising	Falling				

Table Ten: emotional features of music

c) Face

Face is the third category of content assessed. The method uses event coding – looking for a particular pre-determined expression. One reason for event coding is, 'a known association between specific AU combinations and specific emotions' (Cohn et al, 2007: 212). There is a 'sign-based logic' (Cohn et al, 2007: 212) to the facial movements that express emotions. Table 11 shows the criteria which are indicative of emotional responses.

Emotion	**Primary AUs**
Surprise	1+2 5 25 26 27
Fear	1+2 4 5 7 20 25
Happiness	6+12
Sadness	15+17 4+17 1
Disgust	4 7+9 17 6+7
Anger	4 4+7 23 24

Table 11: primary AU combinations and corresponding emotions (adapted from Datcu and Rothkrantz, 2004)

6. Establish a quantification system

Speech and music can both be quantified compared to neutral data. This method uses neutral speech files (see Appendix One for more detailed analysis of these files) taken from three sources, Berlin's Technical University's Department of Communication Science[27] The Centre for Speech Technology at Edinburgh University[28] and Queen's University. There is a limit to the availability of such files, as Gustavson-Capkova noted that: 'there exist corpora of spontaneous speech, but they are generally not distributed' (2001: 2) confirming Seppanen et al's comment that, 'systematically collected emotional speech databases are not usually publicly available' (2003: 1)[29]. The examples used are acted and so there is an element of a

[27] The site is found at http://pascal.kgw.tu-berlin.de. The database has been developed at the Technical University, Institute for Speech and Communication, Department of Communication Science, Berlin with Professor Sendlmeier and his fellows Dr. Astrid Paeschke, Dr. Miriam Kienast (now LKA Berlin), Dr. Felix Burkhardt and was funded by the German Research Association DFG (research project SE 462/3-1).

[28] http://homepages.inf.ed.ac.uk/s0343879/index.html . These neutral speech WAVs were downloaded from Gregor Hofer's site who made available some of the speech samples he created at Edinburgh University

[29] One is in German file as Berlin University has made public its corpus of speech files and the analysis methods and results. While emotional intonation is universal - 'since emotional speech is independent of language' (New et al, 2003: 607) - there are factors which should be acknowledged. Firstly, pitch is used much more to determine meaning in German than English and secondly there was the inconvenience in using English based

mechanical repetition of speech (or stereotypy) about the content and the biological process will not be the same, as Rossato et al noted: 'evidence from neurophysiology showed that acted emotion does not follow the same cortical mechanism as non-acted one' (Rossato et al, 2004: 1). There is no ideal though, as a real emotion would be affected by the recording of it and anyway, 'some subjects who experience emotion may fail to express them, and some who express emotions may fail to experience them' (Amir et al, 2000: 29) so even real-life emotional recordings would have their problems and it is better to rely on a corpus which has been peer-reviewed and fully labelled.

Using these three sources the speech labelled 'neutral' was analysed for the emotional attributes of mean pitch, declination, pitch range, syllable speed, jitter, pitch peak, length from beginning of sentence to peak and vowel formant pitch values (see Table 12 for the resulting data).

Voice Criteria	**Average Neutral Female**	**Average Neutral Male**
Sentence pitch mean	***200***	***111.18***
Mean pitch syllable beginning to end	***-72***	***-54.33***
Pitch range	***160***	***77.66***
Mean time of syllable seconds	***0.20***	***0.17***
Stressed words	***25%***	***134***
Jitter(irregularity)	***9%***	***10***
Sentence accent peak	***262***	***162.90***
Length from beginning to peak	***13%***	***39%***
Vowel formant average F1	***409***	***555***
Vowel formant average F2	***1516***	***1668***
Specific vowel formant levels		
A formant (Fo)1	***1406***	***655***
A Fo2	***2985***	***1511***
E Fo1	***1464***	***1735***
E Fo2	***1852***	***133***
I Fo1	***1477***	***665***
I Fo2	***1542***	***2129***
Ofo1	***1700***	***377***
Ofo2	***2142***	***1760***
U Fo1	***317***	***1548***
U Fo2	***2181***	***1648***

Table 12: neutral data which can be used for comparison

phonetic transcription not working with German words which meant that formants could not be assessed in these files.

Some musical features may be quantified using a nominal system whereby the presence of a stimulus increases its rating as an emotionally-affecting advert. Other stimuli, such as a rising pitch needed a comparison point but there was no available quantified corpus or details of emotional music files. Therefore, an average figure may be gained using randomly selected music. In the absence of an available corpus of neutral music files this method randomly sampled extracts from 50 songs from Apple's iTunes library using their random generator. The files were converted to midi and analysed by MATLAB's MidiToolbox. The results were collected for each of the criteria of music: speed of notes, variation of notes, melodic range, key and pitch rise/fall. This process was repeated in exactly the same way (see Appendix Two) and average figures gained from both samples (See Table 13).

Music Criteria	**Average All files**
Speed of note seconds	0.7154
Standard deviation short/long notes	0.4312
Note distributions 1 to 4	56%
Melodic range semitones	57
Rising pitch in %	43.47441

Table 13: neutral music data which can be used for comparison

Using this data, music can be compared to a neutral source and the results reported in both nominal and ratio manners.

The presence of faces and the AU numbers are evidence of emotional content. Furthermore, the degree of the use of this emotional stimuli can be assessed using a ratio method – based on the frames per second containing faces and the whole advert.

7. Train coders

It is customary in content analysis to use 'trained monitors' (Gunter, 1987: 14) but the coding posed by this method is semi-automatic - largely computer based - and so is, to an extent, outside of coder bias and interpretation. Being semi-automatic overcomes some of

the issues of reliability, particularly inter-coder reliability which must be assessed: 'unless an objective instrument such as a computer is used for coding' (Holsti, 1969: 135). However, A 'lone scholar' approach has the danger of it being, 'rather a subjective process' (Tankard cited in Riffe et al, 2005: 37). This is particularly the case when dealing with the latent meaning of symbols on the screen, 'the individual meaning given to individual symbols' (Riffe et al, 2005: 37).

Whatever amount of coders used, 'explicit rules' (Holsti, 1969: 18) are needed. These explicit rules are essential to avoid reliance on a 'sixth sense' or intuition, both of which are, 'insufficient' (Holsti, 1969: 19). As with reliability, validity is essential for a content analysis to be successful: 'if the categories and rules are conceptually and theoretically sound and are reliably applied, the chance increases that the study will be valid' (Riffe et al, 2005: 156). To be valid: 'the measures (must)…capture the concepts that one thinks they do' (Riffe et al, 2005: 163). The concepts have been defined and the nature of emotional expression explained. This is supported by predictive validity: 'if the outcome occurs as expected, the validity of the measure is established' (Riffe et al, 2005: 165). No-one undertakes a content analysis without a testing procedure and piloting. Pre-tests must be established and refined a protocol for the content analysis.

The method used for coding adverts is outlined in Figure Five and explained by mode: (a) voice, (b) music and (c) face

Music

1. **MPEG to WAV Converter**

Converts advert into WAV audio file to allow Widi to interpret the file

↓

2. **Widi**

Translates music into Midi from a WAV file.

↓

3. **MATLAB (Matrix Laboratory)**

Allows computer analysis of sounds with the add-on freeware Miditoolbox

Voice

1. **Speech Filing System**

Allows transcription and automatically matches letters to the sounds. Has command line function which allows the user to create charts with the phoneme data.

2. **PRAAT**

Gives detailed analysis of the prosodic qualities in voice on pitch means, maximum, minimum, nucleus, jitter etc.

Face

1. IrfanView

Tanslates MPEG audio-visuals into a series of Bitmaps (BMP) format stills at 25 frames per second - which allows the categorisation of audio-visual material

↓

2. Text Pad

Needed for IrfanView as it allows text files to be written in .idx form

↓

3. Icode

Allows coding of frames from an audio-visual. Records the given code for each frame in .idx format.

↓

4. Facial Action Coding System Affect Interpretation Dictionary

Interprets FACS information.

Figure Five: procedure for coding adverts for three stimuli – voice, music and face

a) Voice

In order to measure the nature of expression in the adverts two programs are used: Speech Filing System (SFS) and PRAAT. SFS has automatic phoneme recognition which allows automatic analysis take place reducing error in phonetic transcription and increases the speed and therefore manageability of the technique. SFS aligns the phonemes to the text

automatically. Unfortunately, and understandably, it cannot differentiate between voice signal and music so phonemes on some audio-visuals have to be manually aligned with the voice which can lead to human error although the detail allowed in SFS means a high degree of accuracy in alignment. Simultaneous music and voice will affect the results of the content analysis as the musical signals will have some impact on the pitch reading. A human can hear from 20 to 20,000 Hz and while speech can range from 100 to 4000 Hz, the mean Fo of speech is around 120Hz male and 220Hz female and it rarely exceeds 350Hz. Unfortunately, over half of the notes on a piano are also in this range (Middle C has a mean Fo of 264Hz). As voice mean Fo rarely exceeds 350Hz PRAAT's default judgement of 60-600Hz can be used as this is a program specifically written for phonetic research and this will eliminate some of the higher musical sounds but does not exclude the problem and it is an acknowledged weakness of this method.

b) Music

As with voice, music is coded using computer analysis. It is possible to analyse music qualitatively through listening with an expert ear to a score (cf., Balkwill and Thompson, 1999) which is subject to human error and prohibitively time-consuming and expensive. It is also possible to use notation software such as Finale or Salieri (cf., Webster and Weir, 2005; Juslin, 2000) but these also rely on midi format and then there is the possibility of human error in quantifying the results.

Ideally, the music from the place adverts would be put through an existing program for analysis. Unfortunately no such facility exists as yet[30]. The process of quantitatively

[30] In 2001 an attempt was made to classify songs by mood, 50,000 listeners rated 3,000,000 songs for emotion (MacDorman, 2007: 283) which created a database large enough to create the program Mood Logic. The songs were stored on the database with an emotional label and the common features of the music in the emotional category allowed new music to be added and labelled. This software was discontinued but is now used by AMG in their Tapestry program. This online resource is limited to commercial music so cannot as yet predict the emotion on the place advert music. Sony produced an Extractor Discovery System based on frequency, amplitude and time (MacDorman, 2007: 284) to rate music emotion. This is not available for download so could

assessing music starts with turning it into a monophonic Musical Instrument Digital Interface (midi) using Widi, a commercially available program which transposes WAV[31] files into midi format. Midi uses binary decoding of sound and relays a message about each note in the music - pitch, length etc. Music is polyphonic and much more subtle than midi can ever truly replicate. Midi crudely deals with pitches and lengths and places the original text into monophonic format. The monophonic midi file is fed into Miditoolbox an add-on freely available program to Matrix Laboratory (MATLAB), a commercially-available maths-based program. This specialises in statistics and graphs and is a command line program which allows an element of programming to get specific results. Miditoolbox not only comes with the equipment to analyse midi files but also comes with good theoretical evidence for the operating files. The methods used by MATLAB are explained below for each of the categories of content typical of emotional expression of music: (i) speed of notes, (ii) note length (iii) note distributions (iv) key and (v) key sequences (vi) pitch variation.

i. Speed of notes. Miditoolbox lists the speed of the notes in seconds and MATLAB can compute the average time and this can be compared with the random files figure.

ii. To discover differences in note length, Miditoolbox calculates standard deviation between the lengths of the notes and this can be compared with the average for the random files.

iii. For low contrast of notes pitches 'ambitus' gives a figure showing the difference in semitones between the lowest and highest notes 'Ivsizedist1' which gives a percentage of

not be used. While there is progress in finding ways of classifying music and emotion by listener report, genre and algorithm, none are, as yet available.

[31] Short for Wave, WAV files contain a header with information about name, duration, sampling frequency , coding and channels (mono or stereo). Sampling a mono file at 44.1 kHz would give 44100 values per second this data can then be converted into binary form. When sampling voice, 8.0, 11.025 or 16.0 kHz is acceptable but a higher rate of 44.1 kHz is advised by Owrens and Bochorowski (2007).

note distributions. Ivsizedist1 registers the 13 possibilities (P1 – P8) of note distribution in the octave and displays this as a figure as the mean of each distribution.

iv. 'Keymode' in Miditoolbox examines the note range (or pitches, in Hz) and discovers the key of a midi file.

v. 'Ivsizedist1' in Miditoolbox counts the amount of major and minor key movements in a piece.

vi. 'Ivdurdist1' in Miditoolbox calculates the number of seconds pitch rises and falls in a piece. Ivdurdist produces thirteen figures, a mean for each of the twelve rise movements (e.g. first to third note) in an octave and 12 falls leaving one figure for the same note being played (P1). If the number of falls – where the next note played is lower in pitch exceeds the number of rises, the mean result will be negative and vice versa. If the figure is positive, it can be concluded that there are more rises in pitch than falls and vice versa.

c) Face

Ideally, audio-visuals could be put through a computer program which could quantify the amount of faces and their expressions. At the moment, there is no available way of computer analysis of faces in audiovisual texts[32]. The presence of faces in the texts can be measured by turning an audio-visual file into bitmap (BMP) still images using IrfanView - freeware designed to convert moving images into stills. IrfanView translates MPEGs at 25 frames per second (fps) which can then be put into a coder – Icode. Putting moving into still

[32] Researchers at Carnegie Melon University[32] are working on a Automated Face Analysis (AFA) program recognising, quite rightly that: 'manual methods of coding facial behavior are labor intensive, semi-quantitative, and difficult to standardize across laboratories or over time' (CMU). They are at the third generation (G3) of an automated face analyser which can take in audio-visual data isolate faces, read expressions and output the AU codes.

images as a way of coding video: 'can…be used in coding of video, on the basis that video is a succession of still images' (Ghanbari, 1999: 50). Icode is a program specifically written for Facial Action Coding System (FACS) and allows text to be attached to a frame. In this case, this is the AU numbers if a face appears on screen. The AU numbers can then be fed into Facial Action Coding System Affect Interpretation Dictionary[33] (FACSAID) to get its interpretation. There is an issue about onset and offset times which is down to coder reliability and a potential weakness in the method. To limit this, frames are assessed at 29fps - far quicker than can be comprehended in a moving text - so the coder should be able to identify all expressions of hedonic emotion as seen by the viewer.

5.3 Biofeedback

The last section explained the attributes of emotional content in adverts which could be tested. This section describes the first method of testing for emotional responses in adverts using equipment that reads biofeedback responses starting with (i) sample and then (ii) experimental design.

i) Sample

The study of emotion which involves biofeedback testing is notorious for using students as subjects. James and Sonner noted how: 'much of the research published in academic journals has been decried as the "science of the sophomore" because of the prevalence of using students as research subjects' (2001: 63). Deacon et al called this the 'weakest' method: 'the university professor who uses her students as research subjects'

[33] FACSAID is a web-based program which allows a decoder to put AU numbers in using Ekman and Friesen's Facial Action Coding System. The program available on http://face-and-emotion.com/dataface/facsaid has pre-installed interpretations of AU combinations and so avoids the interpretative element of the FACS method. The only thing the interpreter has to do is decide which muscles have been used to produce an expression.

(1999: 54). Table 14 reveals the extent of this issue – in the examples given, students are used. One of the reasons for this is that some experiments assess precognitive biofeedback response which is a human activity rather than specific to types. Another reason is that this type of experiment into emotion and biofeedback is particularly sensitive as it deals with personal feelings and needs an element of trust between experimenter and subject. Furthermore, the high proportion of studies into emotion which uses students is perhaps due to the complex nature of the testing as it is hard to convince people outside of the academic community of the safeness of the biofeedback equipment. There is also an argument that the 'student' is no longer a homogeneous group (James and Sonner, 2001). Nevertheless, the sampling system used by experimenters into biofeedback emotion tends to be limited and from this it is difficult to generalise results.

Experimenters	**Date**	**Samples**
Khera and Benson	1970	Undergraduate student engineers vs working engineers
Sheth	1970	Male graduate students vs housewives
Enis, Cox and Stafford	1972	Students vs housewives
Cunningham, Anderson and Murphy	1974	Marketing students vs random households
Park and Lessig	1977	Marketing students vs housewives
Burnett and Dunne	1986	Students vs non-students 18-23 vs parents
Whittler	1991	Undergraduate students vs white adults
Brown and Brown	1993	Undergraduate marketing students vs subjects from general population
Corfmandand Lehmann	1994	Undergraduate marketing students vs marketing managers on MBA programme
Surakka et al	1998	11 volunteer psychology students. 4 rejected because of excessive artifacts so 3 male and 4 female
Hess and Blairy	1998	41 female volunteers. mean age 24; SD 8.6 University of Montreal
Orozco Wall and Ehler	1999	15 men of Asian America heritage between 21 and 25 mean = 22 SD = 1.4 in University of California
Sutton and Davidson	2000	81 University of Wisconsin students paid $25 all right-handed no history of psychological or neurological disorders or injury
Bradley and Lang	2000	116 students on University of Florida Psychology course
Schupp et al	2001	20 male, 12 female psychology students University of Greifswald
Winkielman and Berridge	2004	68 university of Chicago undergraduates

Table 14: details of subject use for biofeedback emotional studies (adapted from several sources including James and Sonner, 2001)

A sample of 20 or more subjects should be recruited. The sample used, as Wimmer and Dominick note: 'will depend on the project type, purpose, complexity, acceptability of

error, time, money (and) previous research in the area' (1997: 75). An important element of any experimental research dealing with assessment of emotions is to have a relationship of trust between the experimenter and subject. Therefore, having participants who are known to the researcher and volunteer for the experiment would help to create the optimal conditions for emotional research. For the statistical analysis, having 20 subjects is important as measures like ANOVA mean that 'at least 20 cases be available for each variable in the model' (Riffe et al, 2005: 199). Therefore, this sample is small enough to be practical and large enough to be statistically valid.

ii) Experimental design

Biofeedback experiments should be done under laboratory conditions. The benefits of a laboratory setting include, 'control over the environment, variables and individuals under study' (Gunter, 2000: 30) and while this can never be total, it does limit the external factors which can affect reception of audio-visual material. It also has the benefit of replicability (cf., Gunter, 2000). Nevertheless, as Rottenberg et al note: 'laboratory film procedures (like all emotional procedures) are socially embedded phenomena…Even within the context of single-subject paradigms, subtle changes in the physical arrangements may influence reactivity' (2007: 15). Harmon-Jones et al (2007) provide advice about the experimenter's behaviour - treat all subjects equivalently, avoid being too friendly (and presumably the adverse) and avoid powerful clothing. It is also important for the researcher to be able to remove him/herself from the situation when the adverts are shown to limit 'experimenter expectancy' (Harmon-Jones et al, 2007: 93). However, in response to Curtin et al's recommendation that: 'it is often advantageous for the experimenter to be able to observe the stimuli that are being presented to the participant to verify that the paradigm is executing correctly' (2007: 412). It is also important to have a room large enough to remove the

experimenter from the attention of the subjects and to check on the content and equipment while the adverts were being played.

The equipment needed for this method are a laptop and biofeedback recorder such as ProComp Infiniti which gives 256 readings per second (in the case of heart rate this is 2048 but this can be scaled down for analysis reasons). It is important to have a measuring instrument that could pick up the temporality and delicacy of emotional responses: 'event-related brain potentials…require data collection techniques that accommodate a high degree of temporal resolution' (Rottenberg, 2007: 13).

Pre-tests should be taken from the subjects in front of a blank screen i.e. with the absence of external emotionally-eliciting stimuli. The nature of human biofeedback responses differ so much that to contrast the actual scores between people would be irrelevant. A pre-test - 'the measure of the dependent variable prior to the introduction of the treatment' (Gunter, 2000: 31) - is used to measure and compare the responses while the adverts are shown. This is achieved by placing the subjects in front of a screen with headphones on to reduce attention on other stimuli. Their responses to a blank screen are recorded for two minutes taking baseline data using Rickard's (2004: 377) two minutes for HR SC and EMG.

Between the independent variables in the experiment (the emotional-eliciting factors in the adverts) and dependent variables (audience response measures of biofeedback) there are many intervening factors. Attention is an important one which can affect response. A classic way in which an independent variable of the text and dependent of the emotional responses might both become dependent variables is if the subjects were to focus on actions in the room. Attention can be defined as. 'cognitive process or behaviour by which information is stored in short-term memory' (Clark et al, 1994: 99) being able to focus attention is one of the benefits of the laboratory setting. Here, the subject has headphones on

removing extraneous noises and is positioned directly in front of the screen thus limiting other possible affecters.

Before the experiment, the subjects completed control measures. The control measures followed that of similar experimenters in this field including Peper and Karcher (2001) and Gendolla et al (2001) and comprise the following.

(1) The Edinburgh Handedness Inventory (see AppendixThree) by Oldfield (1971). As emotional processing is done in the left and right-side of the cerebral hemisphere the biological difference between left and right-handed people may be a variable. The handedness inventory is dated – using a broom, for example, is not a common task (cf Williams, 1986) - and it has been suggested that a Likert scale is more widely used and would be cause less confusion among respondents (cf Dragovic, 2004) than the categories given.

(2) Eysenck's Personality Inventory (see Appendix Four) is a well-tested method of assessing emotional stability and response (adapted from Eysenck et al, 1975). Rather than use the whole questionnaire of hundreds of questions, many of which would be irrelevant and too invasive for the purposes of this experiment, questions on emotional proclivity were extracted.

(3) UWIST Mood Scale (see Appendix Five) is a simple-to-complete assessor of the subject's current emotional state. The mood the person is in when they enter the experiment will have some effect on the way they respond to the audio-visual stimuli. Designed by Matthews et al (1990) and developed from other adjective checklists such as the Positive and Negative Affect Schedule (PANAS) (cf., Watson et al (1988)) the responses to the given adjectives test levels of arousal (Gray and Watson, 2007).

(4) Stimulants Details Form (see Appendix Six). In order to ensure responses are as authentic as possible, subjects could be asked to refrain from excessive alcohol, caffeine and nicotine consumption in the 24 hours preceding the experiment[34], as reception of the stimuli is a variable that can affect the results (cf., Cooper et al, 1995; Battig et al, 1984).

Following the completion of these forms electrodes are attached to the subjects. The placing of the electrodes is explained according to biofeedback response: (a) elctromyography (EMG) (b) skin conductance (SC) and (c) heart-rate (HR).

a) EMG

EMG sensors are attached to the relevant regions of the face. The electrodes are connected to an EMG sensor which in turn is plugged into an encoder such as ProComp Infiniti. Bryden et al (1982) found that there is a right hemisphere bias in emotional processing (cited in Peretz, 2001: 121) and specifically, 'decoding of emotion through voice prosody is handled by the right hemisphere of the brain' (Juslin, 2001: 321). The left side of the face seems to be the more expressive as the right side of the brain (which controls it) is more responsible for perception and expression (Sachleim et al, 1978).

b) SC

Two electrodes are attached by Velcro strip to the index and ring fingers to assess SC (sometimes called galvanic skin response and electro-dermal response). These give a record of the electrical impulses sent from the limbic region through the sympathetic nervous system to the skin. These minute changes are recorded in micro-Siemens.

[34] Menstrual phase may have an effect although based on Orozco and Ehler's (1998) found that, 'There were no effects of menstrual cycle phase' (Orozco and Ehler, 1998: 286)

c) HR

One elasticated band strip with sensor should be attached to the middle finger which can show readings of heart rate and blood volume pressure. The finger is a good place to measure heart-rate and it is an easy and relatively unobtrusive point.

5.4 Self-report

The last section explained the experimental design behind biofeedback testing. This section explains the procedure for testing self-report emotional responses to adverts.

The new method posed by this study uses Feeltrace to record self-report emotion. Cowie et al's (2001) Feeltrace coding system includes training instructions - giving the subject a card with an emotional word on it such as 'disgusted' and asking the subject to move the cursor to where this is on the circle. Eight training clips in MPEG format are shown separately, each lasting around twenty seconds and consisting of one person speaking. After this, adverts can be shown in exactly the same way as for the biofeedback experiment while the subjects are instructed to record how they feel.

5.5 Data analysis

Having shown how quantifiable data can be gained from adverts this section considers how the data can be reported and analysed.

As this is a quantitative method it is necessary to assign numbers to the content. Two methods of quantification are nominal and ratio. In the case of the former, a number is assigned to indicate the presence of emotional stimuli. The presence of the hedonic stimuli can be marked as a positive. Each subcategory of content (for example, higher pitch level than neutral) can be marked as absent (0) or present (1). The ratio of the time the emotional

stimuli are on the screen compared to the time they are not can be calculated and this will show its 'relative emphasis' (Riffe et al, 2005: 84). The greater the ratio of emotional stimuli the more convincing the claim that the adverts are designed to elicit an emotional effect. The ratio data is a useful demonstration of the emotional content in the adverts and acts as evidence of the presence of emotional stimuli. It also allows the adverts to be ranked according to their amount of emotional stimuli.

Having demonstrated the data in ratio form, the correlations between the independent variables of the three stimuli – voice, music and face – and the dependent variables of the SC, EMG and HR responses can be measured. One way of doing this is correlation coefficient which, 'provide(s) an indication of the nature and strength of a relation between two sets of values' (Deacon et al, 1999: 90). With a maximum of +1 and a minimum of -1 the number gives a clear indication of connection of variables. Correlations of .7 or above are seen to be strong, correlations of between .4 to .7 are seen to be moderate, and correlations between .2 and the .4 level to be weak (Riffe et al, 2005: p.195). The most widely used method of calculating correlation coefficients, according to Deacon et al (1999) are Spearman's rank order and Pearson's product moment methods. The former is the most useful in the case of demonstrating a link between the dependent and independent variables as their different nature means they must by ranked in terms of, in the case of the independent variable, presence of emotional stimuli and for the dependent variable, level of biofeedback response. The resulting ordinal data can then be compared to see if links exist.

A t-test is another way of dealing with the quantitative data. SPSS's t-test gives details of the difference between figures and informs whether this is significant or not. To be significant, there has to be a probability figure of less than 0.05 ($p<0.05$) for the t-test. T-tests can be used to assess the means of the results. In the case of emotional testing, there is no point in assessing one SC mean against another, for example, as this statistic varies so much from person to person. Instead the difference between pretest SC and the reading while

watching the advert can be used. Another way of using t-tests is to test the difference in ranking whereby the adverts are ranked according to the viewer responses and nonparametric t-test can be used to compare this data. Paired nonparametric t-tests allow the comparison of subject emotional biofeedback responses during the pretest and while watching the adverts to see if there is significant effect on emotions.

As there are more than one dependent variable a multivariate analysis of variance (MANOVA) can measure the overall links between voice, music and faces in the adverts and HR, SC and EMG responses in the viewers. The figures used to measure the dependent variable responses should be the mean differences between the pretests and biofeedback responses while watching the adverts. These mean figures can then be assessed against each of the independent variables together.

It is very tempting with SPSS to rely on the significance date or the probability figure. However, as Pallant stated, it should be 'treated cautiously' (Pallant, 2002: 121). The issue of 'significance' with SPSS can lead to just lazily copying down a connection but, as Pallant stated, 'it is typically a moment of great excitement for most researchers and students when they find their results are 'significant'! Unfortunately there is more to research than just obtaining statistical significance. What the probability values do not tell you is the degree to which the two variables are associated with one another' (Pallant, 2002: 175). Riffe added that: 'statistical significance alone is not a discerning enough measure' (Riffe et al, 2005: 191). For this reason, graph and descriptive data should be included to give a more 'rounded' picture of results.

5.6 Ethical Considerations

There are ethical considerations about the sensitive nature of emotional responses and the damage that discussing and measuring it may do[35]. To overcome some of the ethical issues of asking personal questions and dealing with sensitive data such as drug use and emotional states it is necessary to anonymise the results, each subject being given a number and any connection between names and the numbers kept in a locked filing cabinet for a year and then destroyed. There should be assurances that the subjects can withdraw at any stage. Everything in the room should be made comfortable, explained and a check on the subject made at the end: 'the experimenter must ensure that the participant leaves the experiment in a good mood and that he or she feels relatively positive about his or her experience of the experiment' (Harmon-Jones et al, 2007: 95). Following this, a feedback sheet should be completed which will inform the experimenter of any issues which subjects are uncomfortable with and these should be acted on.

In the case of testing for biofeedback responses it is generally necessary for ethical reasons for the subjects to know the subject matter as there needs to be very clear explanations of why biofeedback testing is necessary and while this may impact on results, 'making them unaware of the hypothesis would prevent them from participating fully in the research process' (Harmon-Jones, 2007: 93).

5.6 Conclusions

This chapter outlined and explained an experimental design for testing the place adverts for emotional content and response. The process is: (1) identify a possible emotional

[35] Emotional testing has a notorious record for unethical behaviour summed up by Rottenberg's term 'bucket of frogs' (2007: 9) techniques recalling previous experiments that resulted in frustrated, shocked and abused subjects (cf., Landis, 1924).

response by interviewing the creators of adverts (2) complete a content analysis of the advert (3) test for biological responses (4) test for self-report emotions and (5) analyse the data. The next chapter shows the results from the experiments using this process. This has a twofold purpose: to demonstrate the usability of the experimental design and to consider the emotional content and responses to place adverts.

CHAPTER SIX

Results of an Example Trial of the Method

This is a study into the emotional content and effects of adverts. Starting with a definition of the subject matter, and arguing that emotion can be seen as a two-process biological and cognitive effect it has argued for a biological primacy to emotion and highlighted three measurable stimuli in adverts that can trigger a precognitive response. Having established this, the last chapter outlined a new way of examining adverts for emotional content and effects based on three stimuli – voice, music and face. The process outlined in Chapter Five forms the structure of this chapter which is an analysis of the emotional content and effects of adverts selling places. The chapter start with (6.1) interviews of the creators of adverts to establish likely emotional content then (6.2) tests this with a content analysis for key emotional stimuli followed by (6.3) biofeedback tests and (6.4) self-report tests that examine the emotional effects of the place adverts. Each section reports on the process and gives descriptive results for each stage. Finally, (6.5), (6.6) and (6.7) give the results of the comparisons between the content and effects while (6.8) considers whether other variables may have affected the results.

6.1 Interviews

The aim of this section is to examine the responses to the interviews with place marketers to establish which emotion(s) the adverts can be tested for.

Interviews were conducted with those concerned with marketing of one place: Coventry. The interviews were with:

- John McGuigan, Director of City Development, Coventry City Council

- Roger Browett, Coventry's Working image Group
- David Beidas, Executive Director, The Belgrade Theatre
- Peter Walters, CV One Head of Image
- Jo Truslove and Jo Burns, CVOne Marketing Department
- Cyrrhian Macrae, Chair, Coventry's Image Working Group
- Derek Nesbit, Creative Director of Talking Birds who produce marketing texts for Coventry

These people agreed to a one hour semi-structured indepth interview with the author. The interviews were face-to-face, one-to-one and occurred once only. The interviews were conducted between December 2003 and March 2004. Each interview followed an interview schedule (see Appendix Seven). The interviews were audio recorded using a digital voice recorder and transcribed and, in accordance with ethical practice, copies sent to the interviewee for approval before publication. Permission was then given for the results to be published and names disclosed.

When directly asked about which emotions were the intentions of the promotional material, the responses were vague and often relied on non-emotive terms. There was, though, agreement about emotions in a general sense – feelgood (or often not feeling bad). Jo Walters (JW) for example stated that, "(feelings are) very important I think. I think the feelgood factor is absolutely key". JM concurred: "it's the feelgood factor that matters". PW explicitly stated how he puts a "feelgood factor" in his brochures. Feeling good was clearly an aim of the marketers as CM explained, "positive emotion is important because it dictates whether they will talk about it in a positive manner or a negative manner". CB explained the importance of feeling good (but saw it in a logical framework of how it may be important): "they start to think about the why was it you felt good…and you try and rationalise it" but later reflected on the importance of "just feeling good". JM put it in the terms of a "positive

sense". CB when considering marketing a place said he asked himself: "will this make people feel good?" wanting, "a feeling of pleasure". As well as a general agreement that positive emotional feelings were important for the selling of places there was much on reducing negative feelings with which the city had become associated. CM bemoaned the "too much coverage of negative stories" in the media and the need for "spirits (to be) lifted". DB likewise discussed the importance of avoiding negative emotions. RB added, "it is really quite difficult to counter the somewhat negative image".

More specific emotions were also mentioned during the course of the interviews. PW wanted "pride" and also to reduce the "cynicism" and "apathy". When asked specifically about whether it was possible to love a place there was agreement but the qualifying comments tended to move to other places and how they were seen rather than any explanation of why or how this may have taken place or indeed the benefits of loving a place. JM, for example, replied to the question of whether it is possible to love a place "certainly" but when asked if he would like people to feel love for the place he markets said, "I would like people to say, 'my city'". PW likewise was clear in his response to the question, "Oh! I think you can, yeah, there are people who do you know they do love places" but more practical needs were to be considered first. CB deflected onto pride, pressed again about love, he said, "yeah, almost it does, yeah" but then returned to pride. Indeed pride more than love was a desired emotion for many interviewees. PW, DB ("a sense of pride"), JM ("people become very proud about the place"). As with positive emotions discussion often went to avoiding negative emotions of fear. As DB stated: "a section of the population…don't feel safe". CM concurred with "safety matters".

6.2 Content analysis

The last section reported results of interviews with place marketers and suggested that one common emotion that is aimed for in place adverts is a happy, or hedonic one. This section reports the process and results of a content analysis of place adverts.

A coding schedule (see Table 15) was drawn up based on the criteria from Chapter Five for hedonic emotion.

Voice Criteria	***Average neutral female***	***Average Neutral Male***	**Evidence of Hedonic Response**
Sentence pitch mean	***200***	***111.18***	Higher
Mean pitch syllable beginning to end	***-72***	***-54.33***	Lower
Pitch range	***160***	***77.66***	Higher
Mean time of syllable seconds	***0.20***	***0.17***	Higher
Stressed words	***25%***	***134***	Higher
Jitter(irregularity)	***9%***	***10***	Higher
Sentence accent peak	***262***	***162.90***	Higher
Length from beginning to peak	***13%***	***39%***	Higher
Vowel formant average F1	***409***	***555***	Higher
Vowel formant average F2	***1516***	***1668***	Higher
Specific vowel formant levels A Formant (Fo)1 A Fo2 E Fo1 E Fo2 I Fo1 I Fo2 U Fo1 U Fo2	 ***1406*** ***2985*** ***1464*** ***1852*** ***1477*** ***1542*** ***1700*** ***2142*** ***317*** ***2181***	 ***655*** ***1511*** ***1735*** ***2133*** ***665*** ***2129*** ***377*** ***1760*** ***1548*** ***UF21648***	Higher

Music Criteria	**Average All files**	**Evidence of Hedonic Response**
Speed of note seconds	0.7154	Faster
Standard deviation short/long notes	0.4312	Smaller
Note distributions 1 to 4	56%	Higher
Melodic range semitones	57	Higher
Major key		
Rising pitch in %	43.47441	Higher

Face Criteria	**Evidence of Hedonic Response**
Faces Present	AU6 + AU12

Table 15: coding schedule

Having created the coding schedule, a sample of place adverts was gained. It was important to recognise that not all place adverts are available on television as some place

adverts come in CD/DVD/video forms. To gain CDs/DVDs/videos from tourist boards England was chosen because of accessibility (ease of contact, price of postage, language considerations etc). The Tourist Information Centre or, if it could be identified, the company responsible for marketing the city, were chosen and often both and most replied (see Appendix Eight for details). Nine usable texts resulted and they were transferred into the same digital form[36] so they could be computer-analysed[37]. They were either taken from video through an analogue-digital converter and onto DVD where they could be directly stored on a hard drive or from CD onto the hard drive. Further, place adverts were selected from Creative Club which allows a word search of its advert database. The sample was all of the adverts that were listed under the search words 'tourism', 'TV' and the time limit of 2005 (see Appendix Nine for details). While sampling from the internet has its drawbacks this is a UK-based site so pre-selects which adverts will be sent on the basis of being shown in the UK. Stempel and Stewart (2000), commenting on sampling newspapers and broadcast stations, warned about using the internet for sampling as the databases were convenience rather than representative. This must stand as a criticism of this method as it is reliant on the choice of Creative Club for texts and they, being a commercial site, do not have rigorous methods or codes of sampling. However, the difficulty in finding adverts (an alternative being to tape whole days of television and then there would be questions about which channels and how to define the genre of adverts) and the fact that only random examples of the genre were needed meant the method should suffice. Indexes and web-content searches is often used in mass media research (Riffe et al, 2005) and it has the benefit of clustering and the element of being random in the sense of being outside the researcher's control but, as Riffe et al note: 'the sample, although randomly determined may not be representative' (2005: 110).

[36] The audio-visuals were downloaded in Moving Picture Experts Group (MPEG) format from which sound was converted into a Waveform (WAV) file using the commercially available MPEG to WAV converter program.
[37] The latter proved to be difficult owing to the format often using flash which means it would not all store onto a hard drive and did not work in a linear fashion so three audio-visuals were lost – Nottingham, Liverpool and Bristol - as they could not be put through the analysis process.

The adverts were limited to approximately 30 seconds each. The approximation due to the fact that complete international audio-visuals varied from 20 to 40 seconds and it seemed unnecessary to edit them but longer adverts were cut at 30 seconds. To sample, it was taken into account that emotions are very quick to respond to stimuli so needed an in-depth look at each text. This meant too large a sample would have been impractical and unnecessary, especially as they could not all have been viewed by an audience.

The results of the content analysis will now be reported by stimuli: (a) voice, (b) music and (c) face then the results for all three stimuli will be (d) discussed.

a) Voice

There were 13 adverts with voice-overs. Below are the results of the analysis of the voice-overs in the place adverts based on the criteria for hedonic speech: i) higher than the sentence mean pitch of the neutral files (Neutral) (ii) a higher pitch declination than Neutral (iii) a higher pitch range than Neutral (iv) a quicker syllable speed than neutral (v) a greater percentage of stressed words than Neutral (vi) a higher jitter rate than Neutral (vii) a higher sentence accent peak than Neutral (viii) a longer length between the sentence start and accent peak than Neutral (ix) at least 30% higher levels of formant pitch of phonemes in the sentence than neutral and higher vowel formant pitches than Neutral.

i) Mean pitch

As Figures six and seven show 6 out of 13 voice-overs had a higher pitch level for the place advert music than the neutral files. Bulgaria (113Hz), Croatia (118Hz), Spain (183Hz), Coventry (151Hz), Birmingham (140Hz) and York (119Hz) were higher than the neutral files' mean pitches (male=111Hz; female=200Hz).

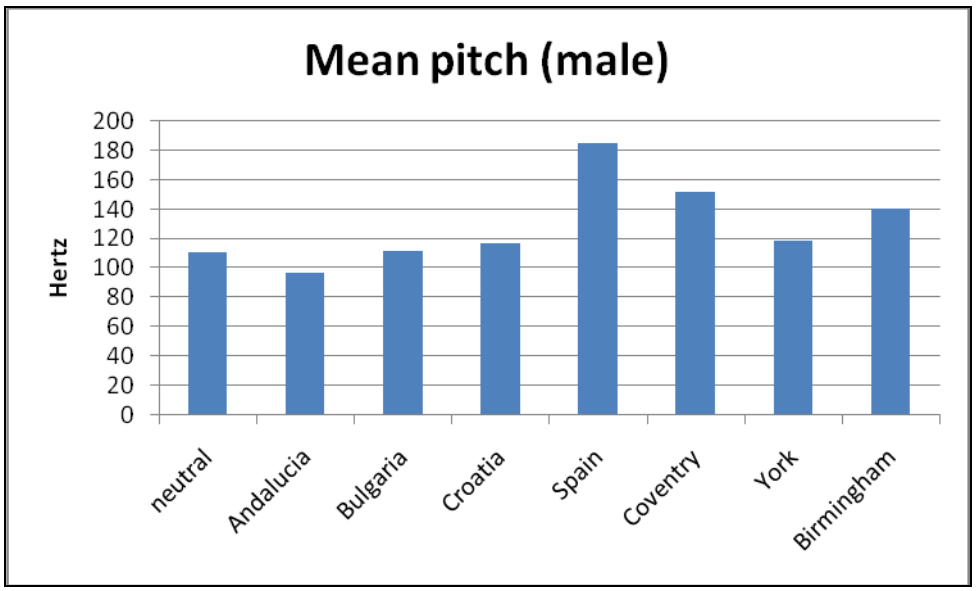

Figure Six: male mean pitch of the speech in the adverts

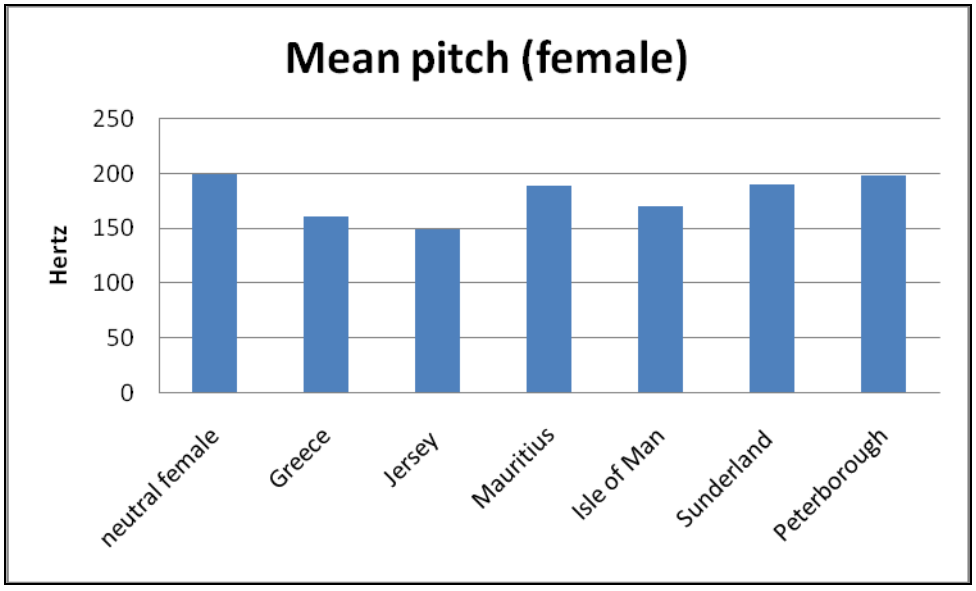

Figure seven: female mean pitch of the speech in the adverts

ii) Pitch declination

As Figures eight and nine show, 5 out of 13 voice-overs had a larger pitch declination than the neutral files. Andalucia (-81Hz), Croatia (-83Hz), Spain (-207Hz), Coventry (-243Hz) and Greece (-112Hz) were all lower than the neutral files. Two place adverts (Sunderland, +365Hz; Mauritius, +10Hz) increased in pitch from the first syllable to the last.

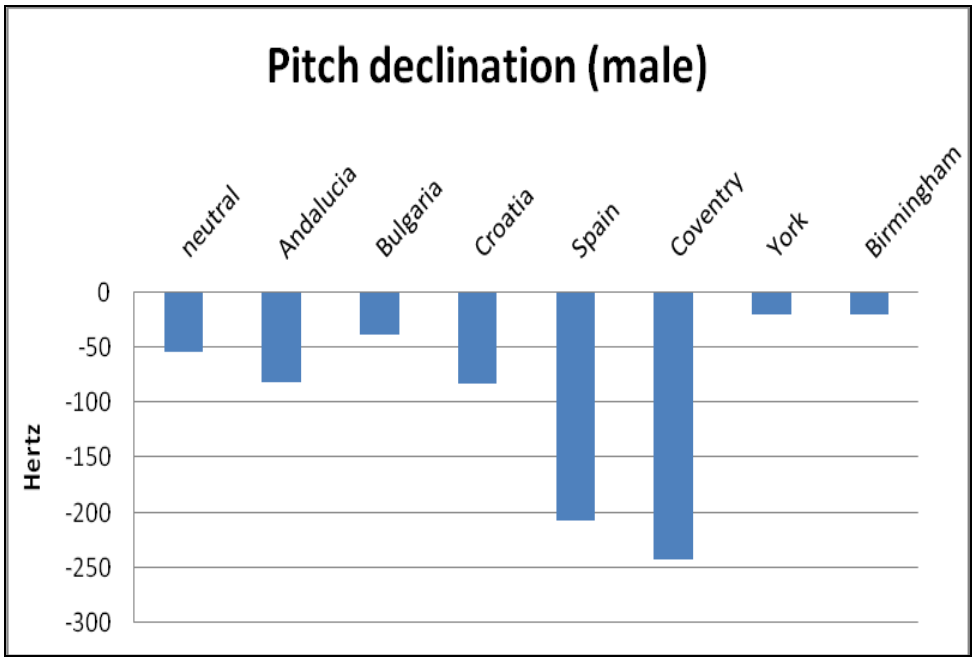

Figure eight: male pitch declination in the speech in the adverts

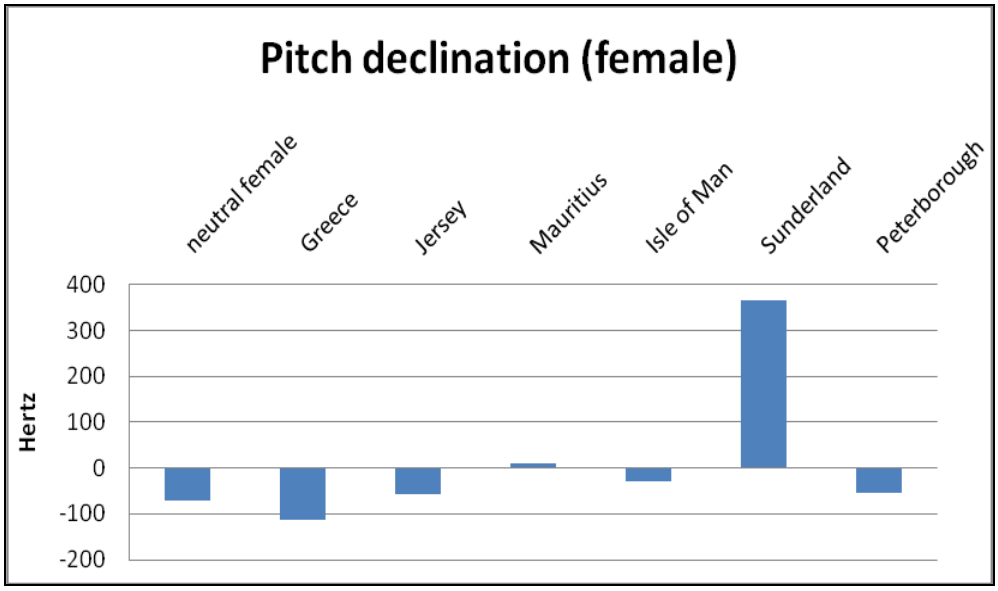

Figure nine: female pitch declination in the speech in the adverts

iii) Pitch range

As Figures ten and 11 show, 11 out of 13 voice-overs were higher in pitch range than the neutral files. Croatia (112Hz), Birmingham (129Hz), Coventry (282Hz), Greece (180Hz), Jersey (209Hz), Mauritius (526Hz), Isle of Man (233Hz), Sunderland (490Hz), Peterborough

(524Hz), Sunderland (490Hz) and Peterborough (524Hz) were all above the pitch ranges of the neutral files.

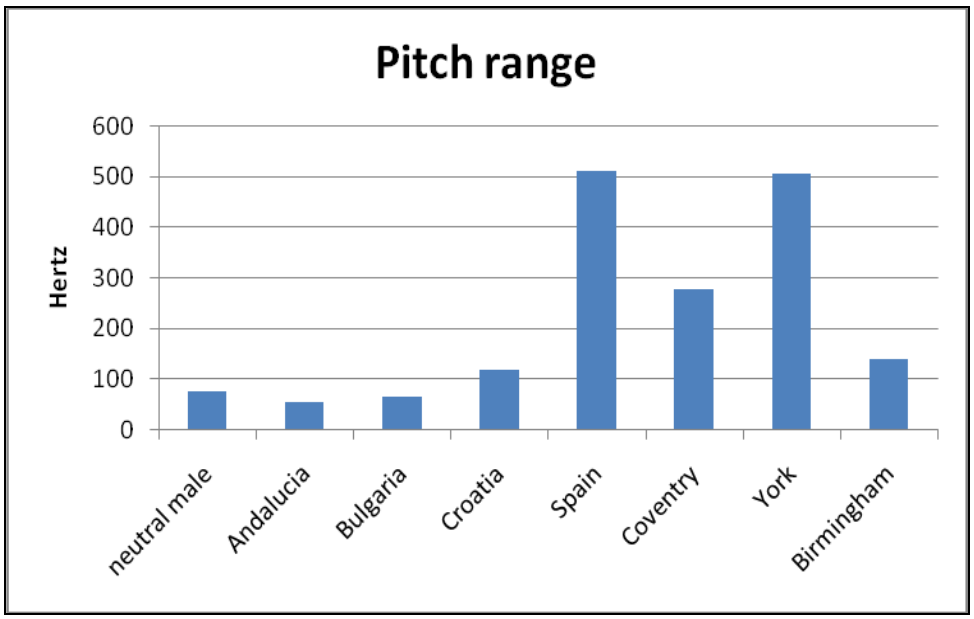

Figure Ten: male mean pitch range of the speech in the adverts

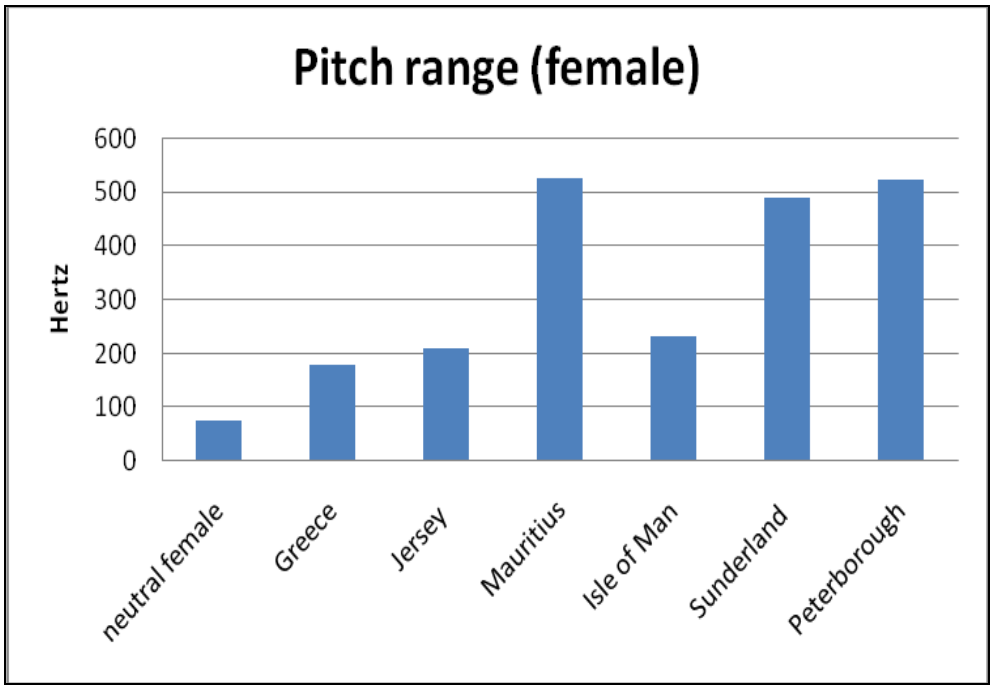

Figure 11: female mean pitch range of the speech in the adverts

iv) Syllable speed

As Figures 12 and 13 show, the mean syllable speeds in the neutral files were quicker than in the place adverts. Only Croatia (0.12 seconds) and Birmingham (0.046 seconds) were quicker.

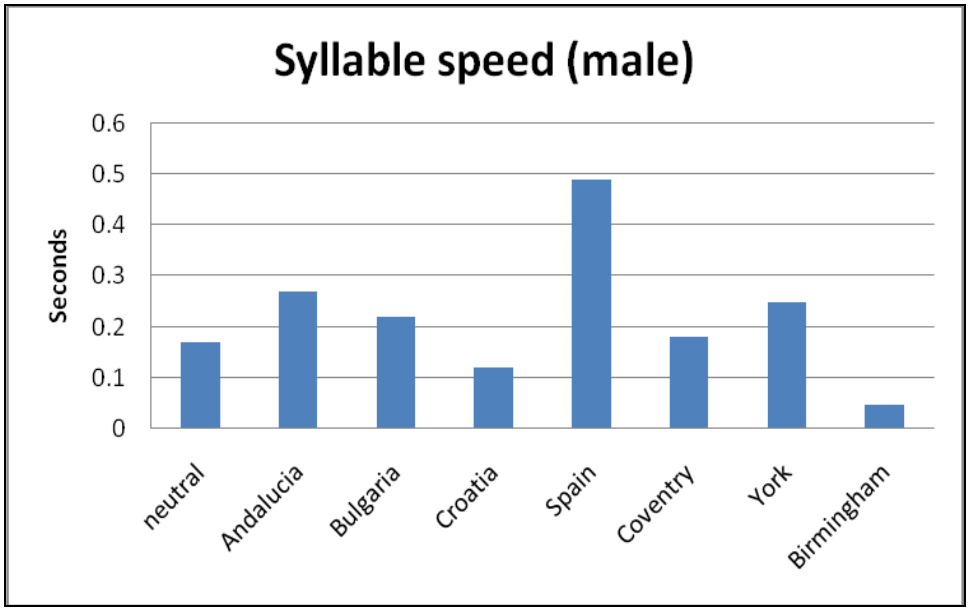

Figure 12: male mean syllable speed in the speech in the adverts

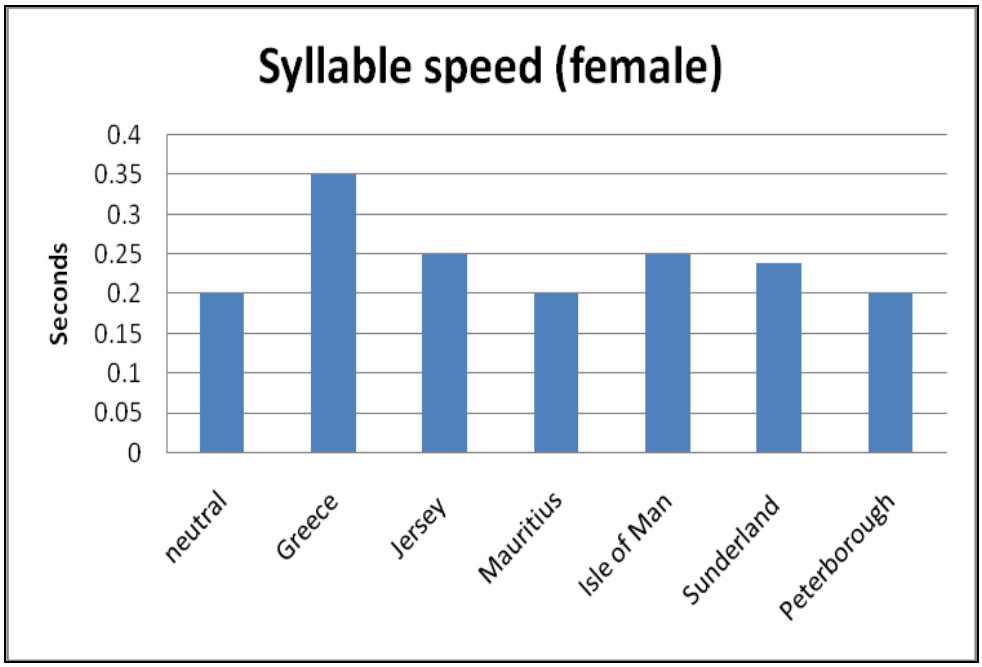

Figure 13: female mean syllable speed in the speech in the adverts

v) Stressed words

As Figures 14 and 15 show, more words were stressed in 7 out of 13 voice-overs than in the neutral files. Andalucía (100% words stressed), Jersey (40%), Mauritius (41%), Croatia (50%), Spain (55%) Peterborough (57%) and Birmingham (44%) all have a higher percentage of stressed words than the neutral files.

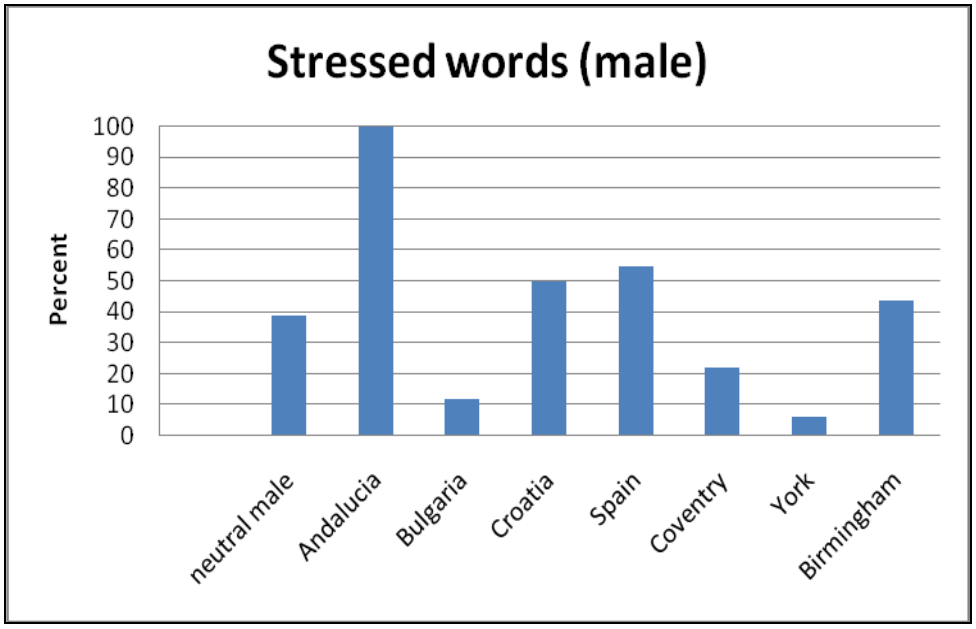

Figure 14: male mean amount of stressed words in the speech in the adverts

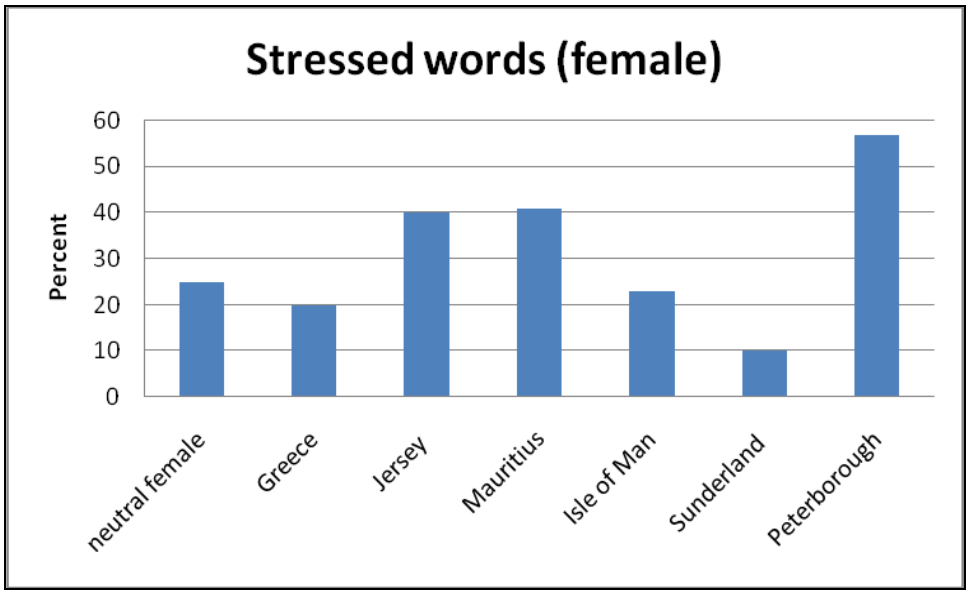

Figure 15: female mean amount of stressed words in the speech in the adverts

vi) Jitter rate

As Figures 16 and 17 show, the jitter rate for all voice-overs except Andalucia, Bulgaria and Mauritius were higher than the neutral files. Birmingham (44%), Croatia (50%), Coventry (22%), Greece (22%), Isle of Man (10%), Jersey (10%), Peterborough (12%) Spain (54%), Sunderland (16%) and York (13%) were all higher.

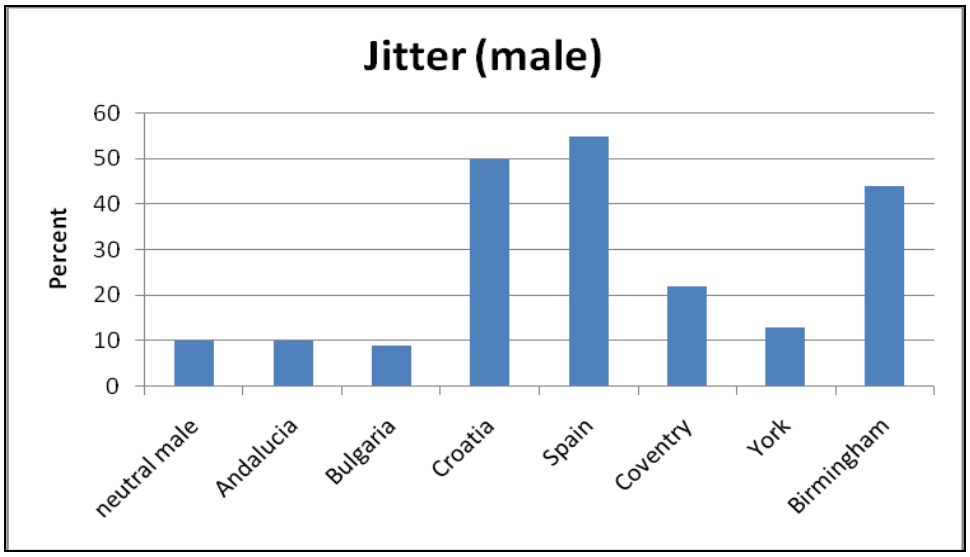

Figure 16: male jitter rate in the speech in the adverts

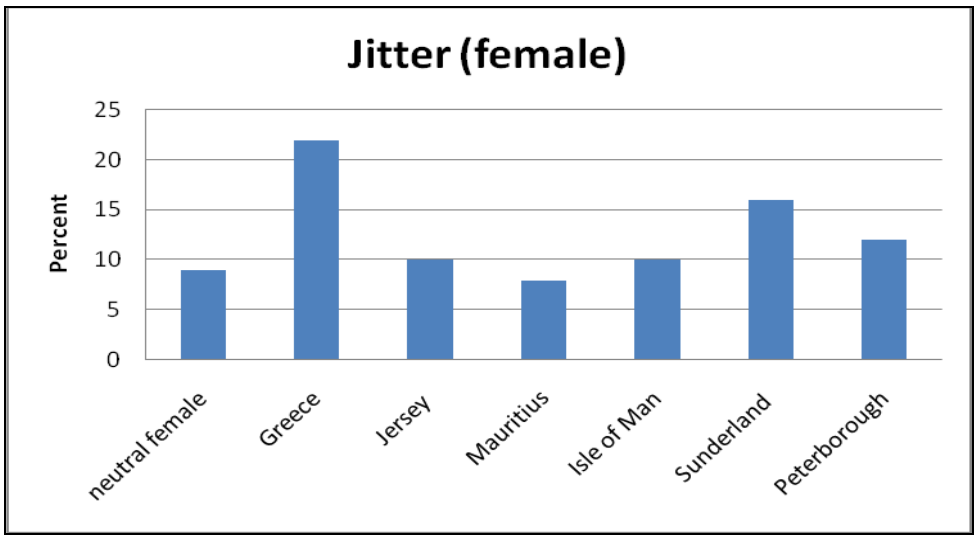

Figure 17: female jitter rate in the speech in the adverts

vii) Sentence accent peak

As Figures 18 and 19 show 10 out of 13 voice-overs had a higher sentence accent peak than the neutral files. Birmingham (242Hz), Coventry (319Hz), Croatia (184Hz), Isle of Man (322Hz) Jersey (276Hz), Mauritius (594Hz), Peterborough (599Hz), Spain (586Hz), Sunderland (558Hz) and York (584Hz) all had higher peak pitches than the neutral files.

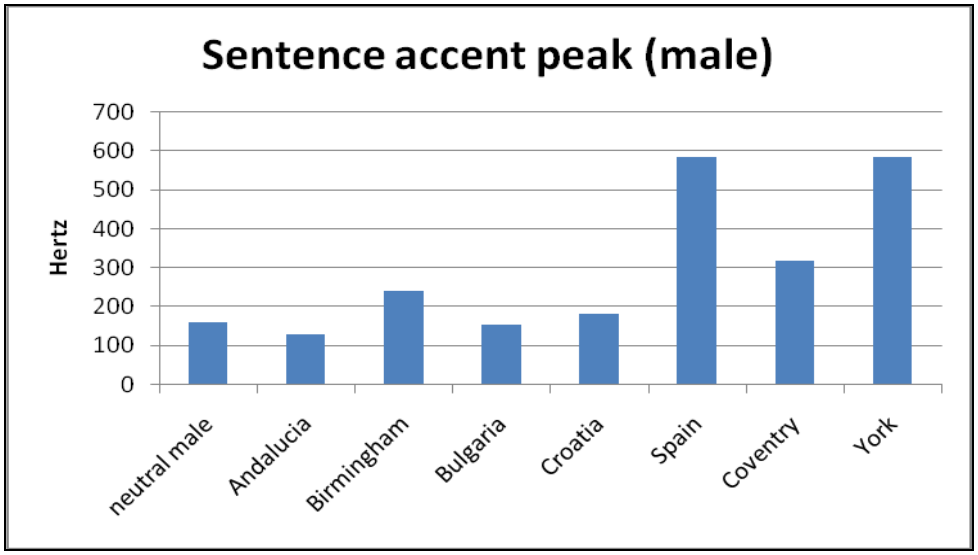

Figure 18: male sentence accent peak in the speech in the adverts

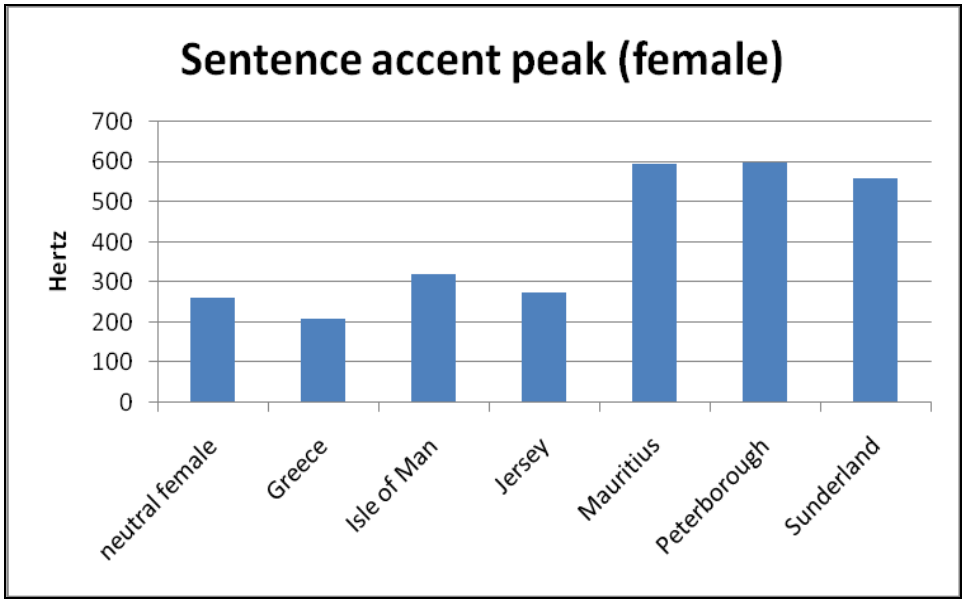

Figure 19: female sentence accent peak in the speech in the adverts

viii) Length to accent peak

As Figures 20 and 21 show all voice-overs except Bulgaria had an accent peak later in the sentence than in the neutral files. Andalucía (after 95% of the sentence), Birmingham (79%), Coventry (55%), Croatia (65%), Greece (60%), Isle of Man (71%), Jersey (65%), Mauritius (66%), Peterborough (87%), Spain (88%), Sunderland (66%) and York (56%) had a first sentence which peaked later than the neutral files (male=39%; female=13%).

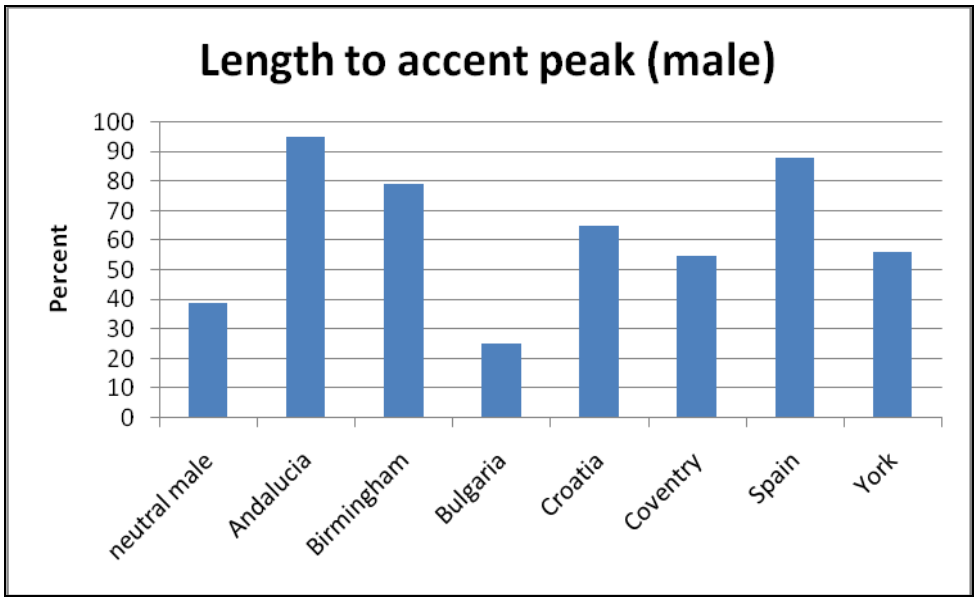

Figure 20: male length from start of sentence to accent peak in the adverts

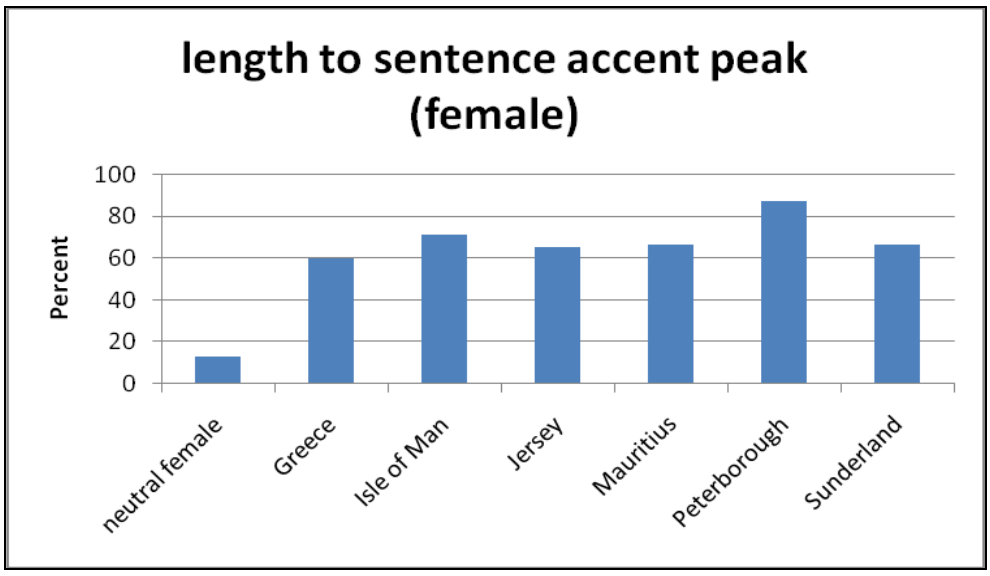

Figure 21: female length from start of sentence to accent peak in the adverts

ix) Formant pitch

As Figures 22 and 23 show, the mean formant pitches of phonemes from the voice-overs were higher than those of the neutral files. Significantly higher (+30%) formant readings for F1 and F2 were in 9 out of 13 voice-overs: Andalucía, Birmingham, Bulgaria, Coventry, Isle of Man, Jersey, Mauritius, Peterborough and York. Figures 24 and 25 demonstrate the specific vowel pitch increases in the place adverts compared with the neutral files. They show that Andalucía, Bulgaria, Croatia, Isle of Man, Jersey and Mauritius had vowel formant pitches considerably higher than the neutral files.

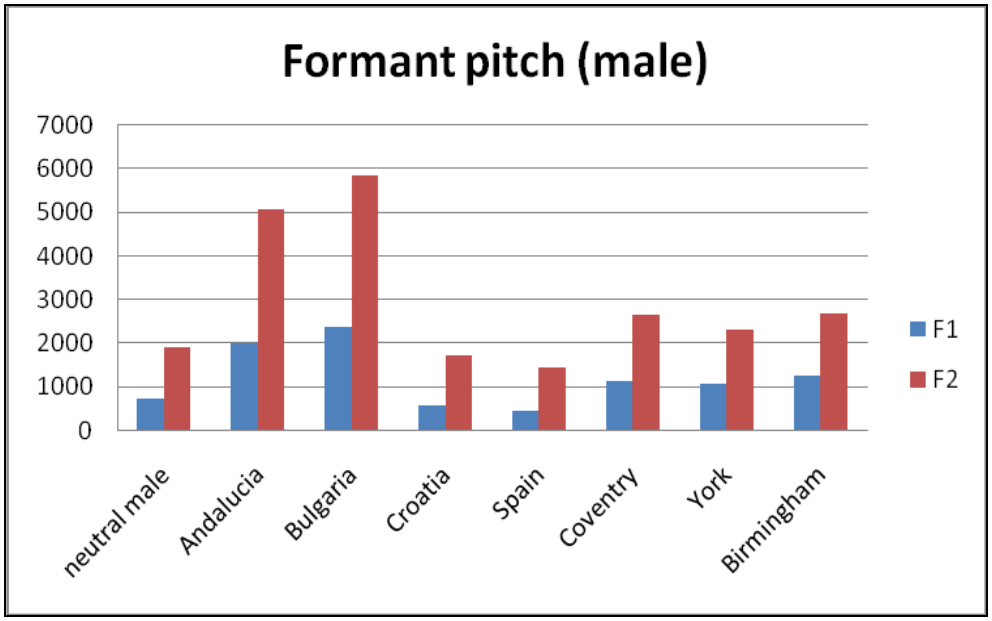

Figure 22: male mean formant pitches for F1 and F2 from the speech in the adverts

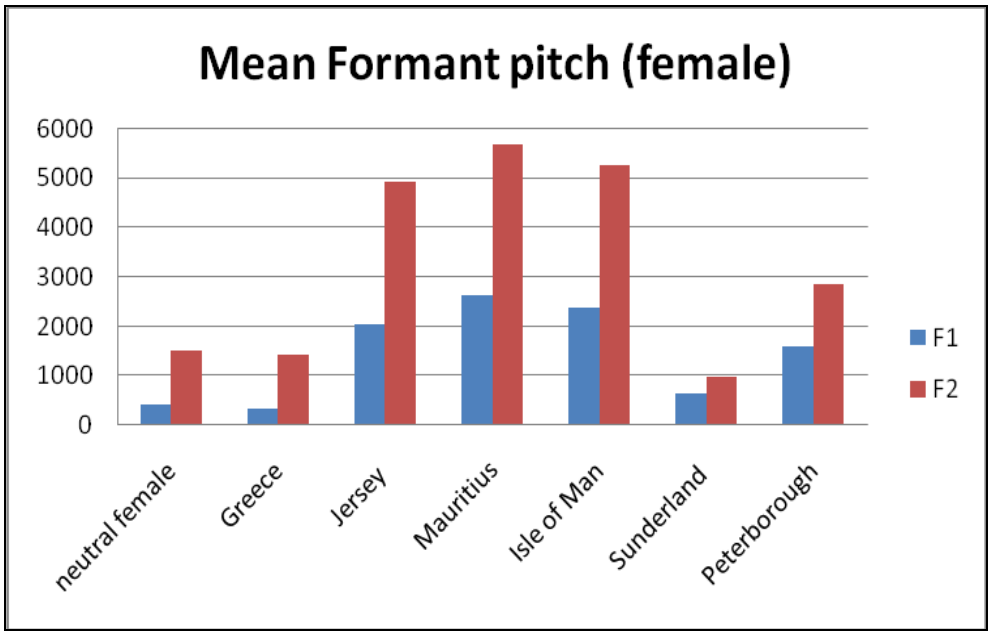

Figure 23: female mean formant pitches for F1 and F2 from the speech in the adverts

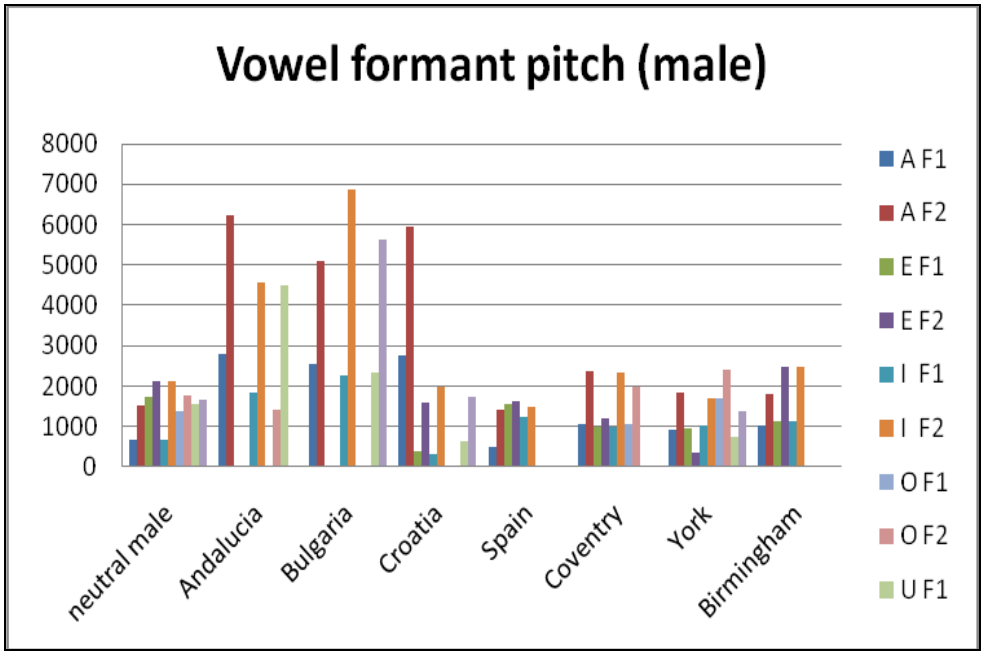

Figure 24: male mean formant pitches for vowels from the speech in the adverts

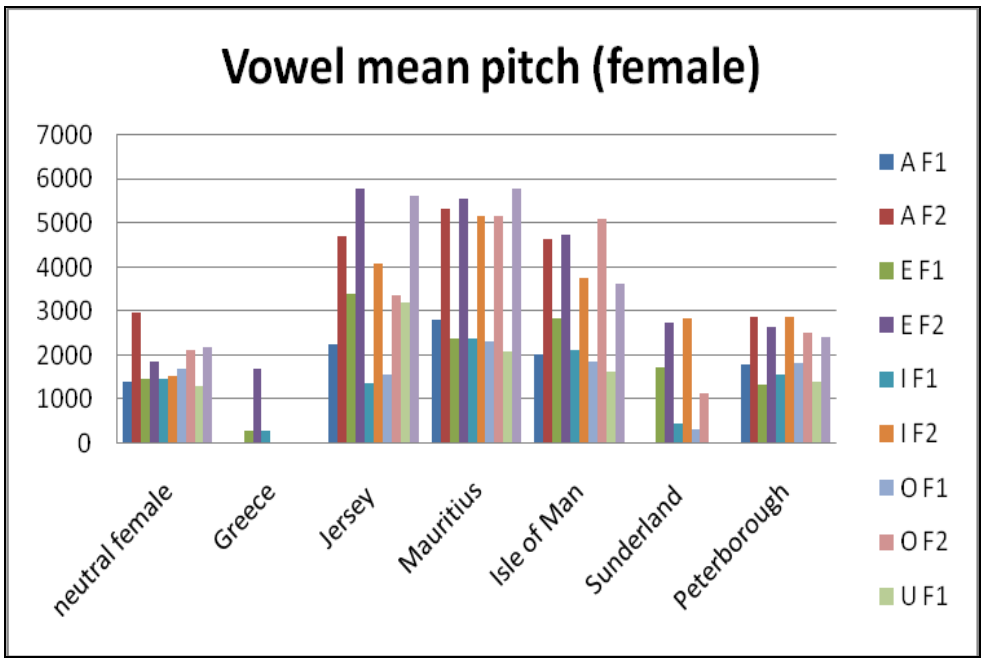

Figure 25: female mean formant pitches for vowels from the speech in the adverts

In general the results were positive and showed an attempt to elicit hedonic responses. As Figure 26 shows in the tourism audio-visuals there was a 69% success rate (98 events out of a possible 141). Therefore, the criteria for hedonic voice expression (quick syllable rate, high stress of words, high jitter level, high sentence accent peak, later length from beginning to peak and vowel formant average increase) were evident in the place adverts. The results are strongly indicative of hedonic expression and the similarity between the expression in all of the audio-visuals suggests that the place adverts are attempting to elicit a hedonic effect through the use of the. There were, though, some place adverts which had low results with Bulgaria (5 out of 11), Greece (5 out of 11) and Sunderland (5 out of 11) fulfilling less than 50% of the expected criteria. Coventry (10 out of 11), Spain (9 out of 11), York (9 out of 11) and Jersey (9 out of 11) had particularly high levels of hedonic voice content.

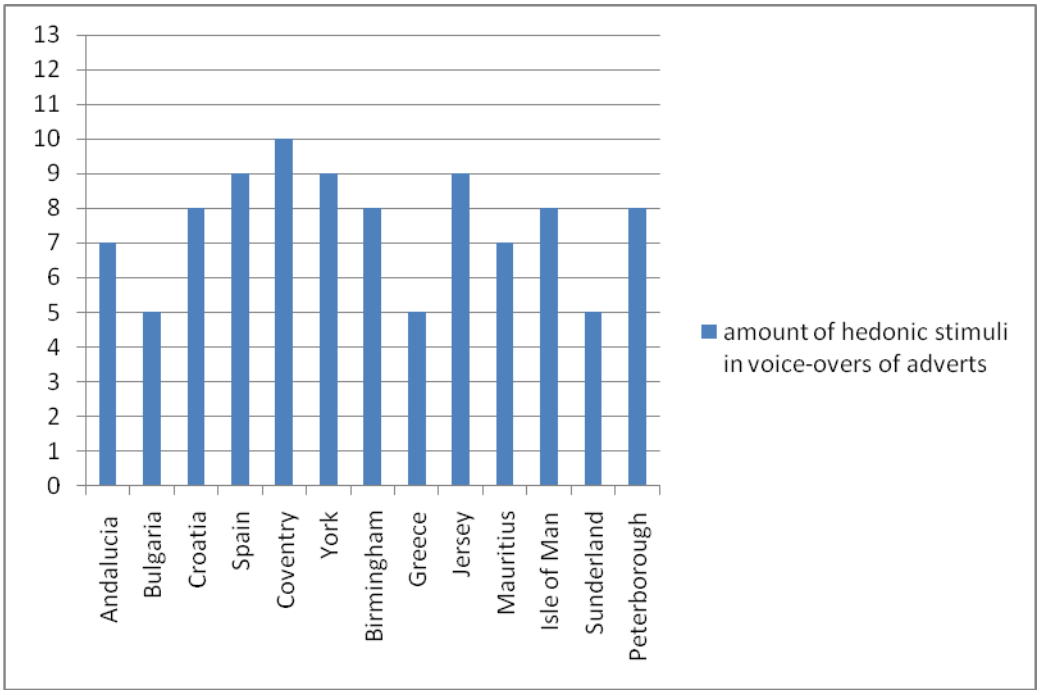

Figure 26: bar chart showing presence of hedonic voice stimuli in place adverts

b) Music

There were 13 place adverts which contained music which were analysed for hedonic expression. This section shows the results of the analysis of the music in the place adverts. The criteria for hedonic expression in music of (i) a fast note speed than mean for the randomly selected music (Random) (ii) a smaller standard deviation between the place advert music and Random (iii) a higher percent of small note distributions (consecutive movement between first and fourth note) than Random (iv) a higher melodic range than Random (v) music in a major key (vii) a higher percentage of rising pitch in consecutive notes than Random.

i) Note speed

As Figure 27 shows, the notes in the place adverts were significantly and consistently quicker than Random in the music in all of the adverts. Random was 0.71 seconds (s) while the lowest speed of note in the adverts was Coventry's 0.1s.

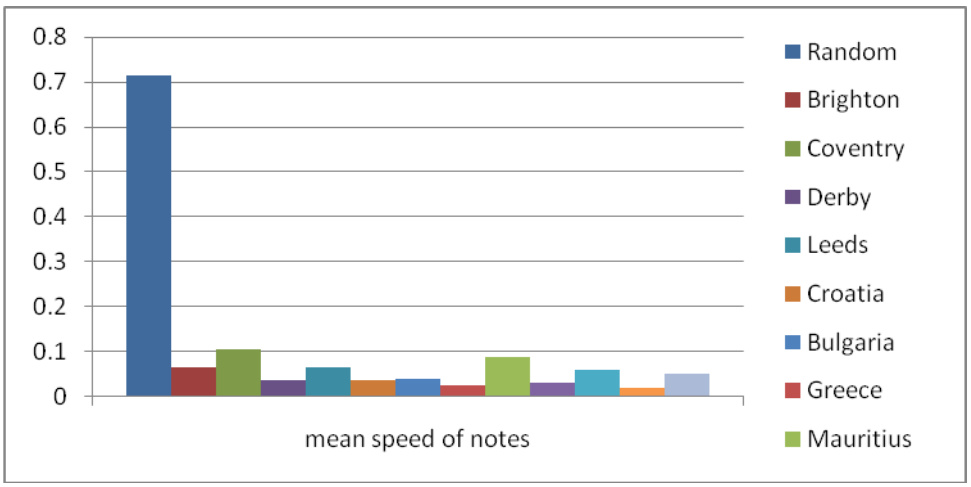

Figure 27: mean speed of notes of the music in the adverts

ii) Standard deviation

As Figure 28 shows the standard deviation of notes was much smaller for place adverts than for Random. Standard deviation of notes was 0.43 seconds against the place adverts' 0.05 seconds.

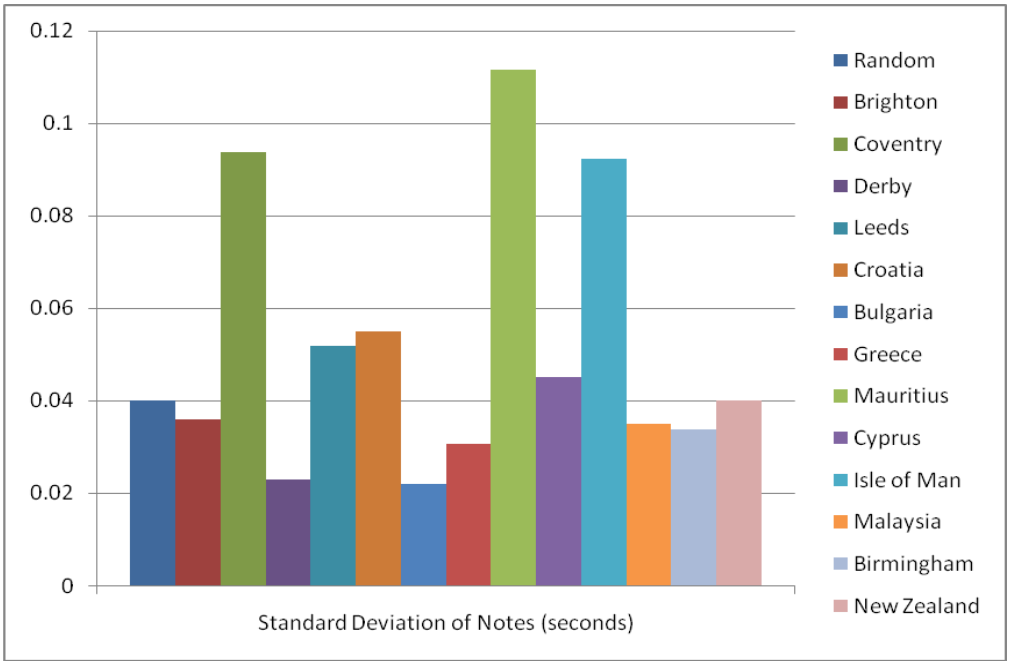

Figure 28: standard deviation of notes of the music in the adverts

iii) Note distribution

As Figure 29 shows, movement of notes was mostly within the first 4 notes of the octave. 79% of all note changes in the place adverts moved no further than this compared with 56% for Random.

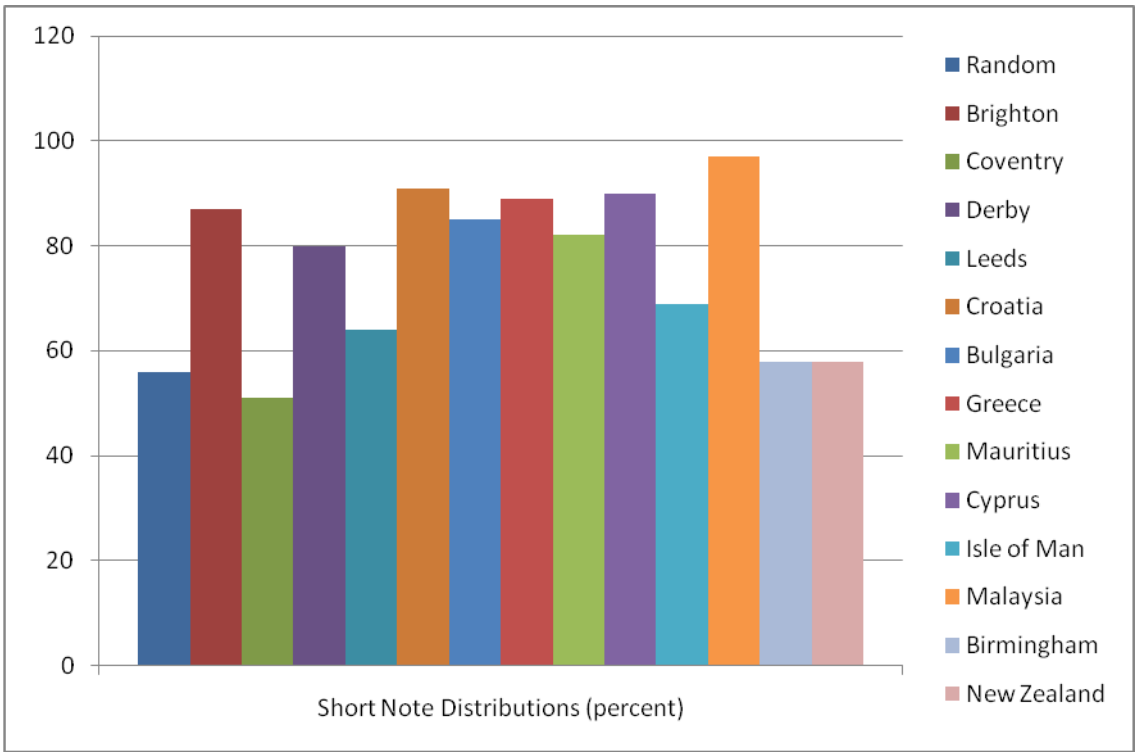

Figure 29: note distribution in the advert music

iv) Melodic range

As Figure 30 shows, the melodic range of the place advert music does not vary much from Random. The place advert music was slightly higher, on average using 61 semitones from lowest to highest in the whole piece against Random's 57. Some place adverts (Brighton, Leeds, Croatia, and Isle of Man) had semitone ranges of 70 and above with Coventry had the lowest note range suggesting a very limited piece of music melodically.

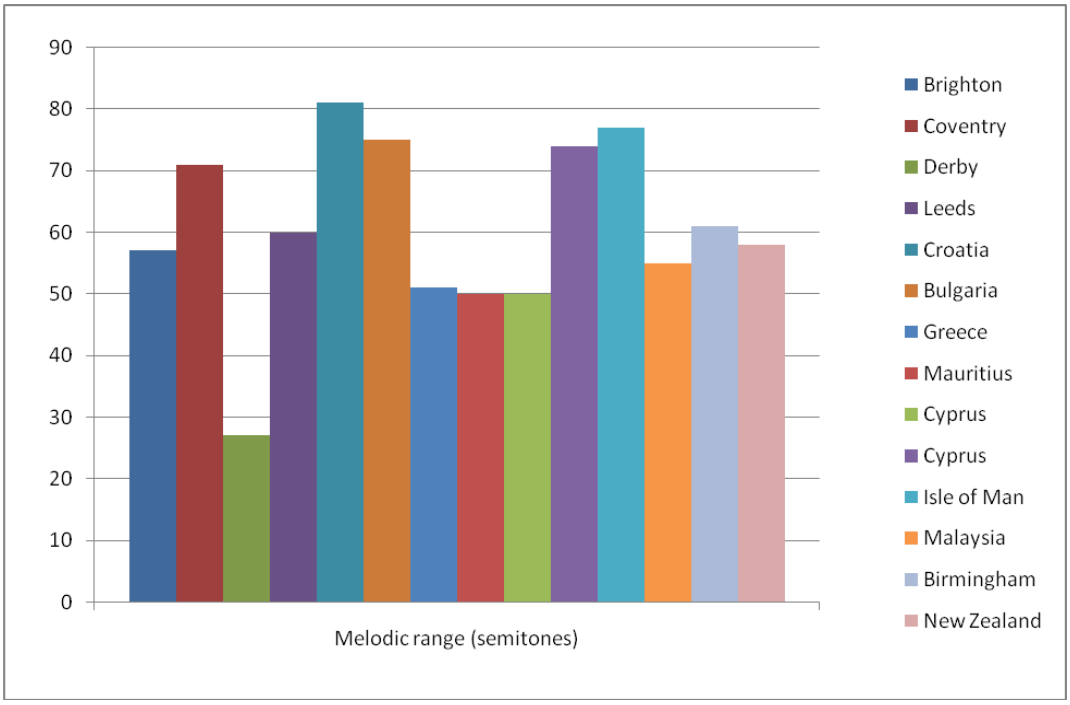

Figure 30: melodic range in the advert music

v) Key

As Figure 31 shows, 10 out of 13 place adverts were in a major key with 3 exceptions of Greece, Bulgaria and Cyprus.

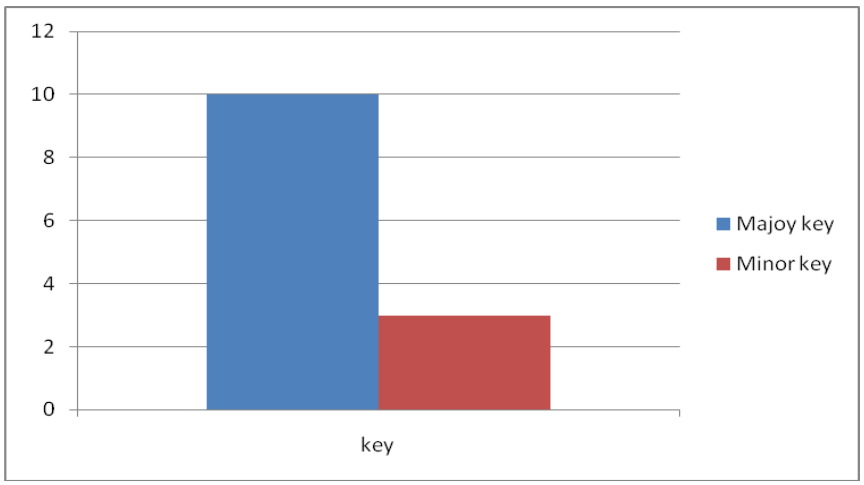

Figure 31: key of the advert music

vi) Rising pitch

As Figure 32 shows, there were mixed results for rising pitch. Random had a mean figure of 43% of all notes going higher than the previous note. Only Leeds (49%), Bulgaria (53%), New Zealand (50%) and Isle of Man (62%) had more rising notes.

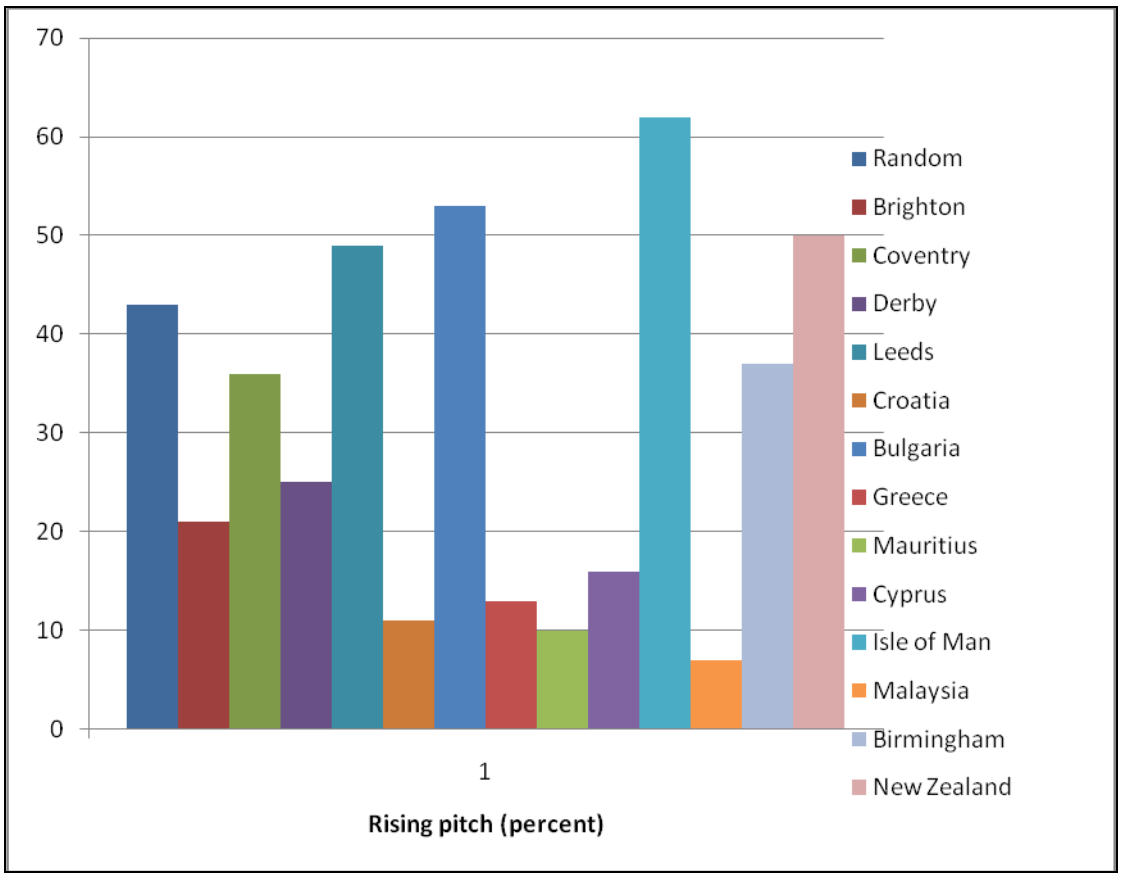

Figure 32: rising pitch between consecutive notes in the advert music

Figure 33 shows the results of the content analysis of hedonic musical stimuli. This is based on seven criteria that indicate the expression of happiness: quick speed of notes, high contrast of short and long notes, high pitch level, major key, high amount of major key sequences, melodic range and a rising pitch. As Figure 12 shows, there was evidence for the presence of hedonic musical stimuli in the adverts which contained music. Birmingham (4 out of 7) and Coventry (3 out of 7) expressed the least hedonic criteria and the Isle of Man and Leeds contained all possible hedonic criteria. The 65% (55 out of 84) success-rate wherein the expected criteria were fulfilled show that the music is hedonic. For the UK

adverts this was especially the case with 69% (24 out of 35) of the criteria being fulfilled while for the international place adverts the figure was 63% (31 out of 49). The figures for music indicate that it is attempting to elicit a hedonic effect. Having identified the criteria for hedonic expression and found a 65% success rate in the advert music. This may be considered to be a positive result. Leeds and the Isle of Man (6 out of 7) showed a high degree of hedonic expression but only one advert had music which fulfilled below 50% of the criteria.

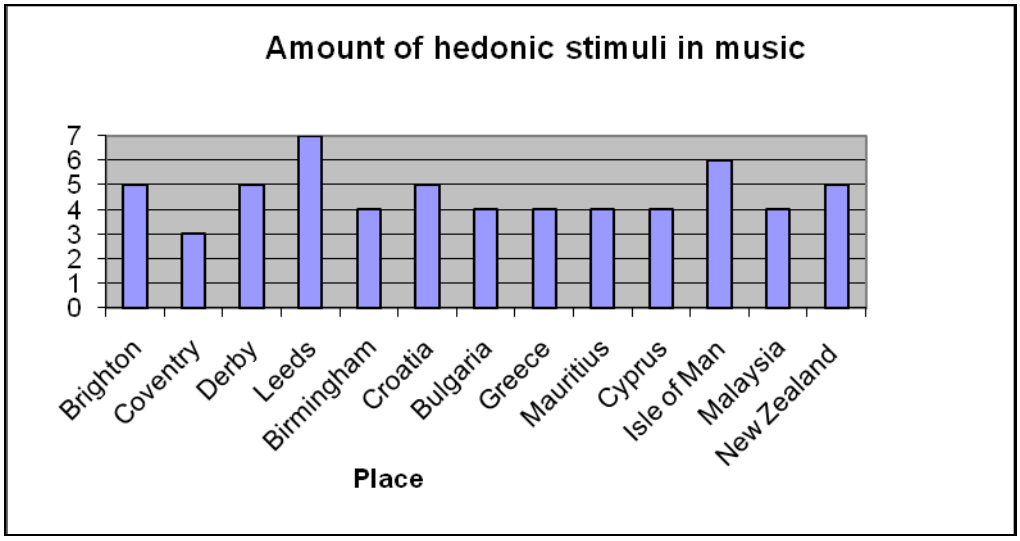

Figure 33: the presence of hedonic music stimuli

c) Face

Having presented the results of a content analysis of voice and music, this section reports the results of the final stimulus, face.

There were eight adverts with faces expressing happiness on the screen: Andalucía, Cyprus, Greece, Isle of Man, Malaysia, Mauritius, New Zealand and Spain. For each of these adverts the mean EMG response to the whole advert was compared to that while the smiling faces were on the screen. This would give an indicator of whether the faces were having a specific effect on the EMG responses.

While there were faces expressing happiness in 8 out of 20 adverts, 12 did not include them so this does not suggest an attempt by place marketers on the whole to elicit feelings of happiness through this technique. As Table 16 and Figure 34 show 8 out of the 20 adverts did not have images of hedonic expressions. One advert with the highest proportion of the time given over to this hedonic technique is New Zealand, 19% of the whole advert contains smiling faces. Andalucía and the Isle of Man also had a good proportion of hedonic faces at 13% and there was 8% or less for the remaining five places. There was a noticeable division here between UK and international place adverts with only two UK places (Jersey and Isle of Man) out of 11 using the technique while with the exception of Croatia and Bulgaria all nine international place adverts used this method of attempting to elicit a hedonic response in the viewers.

Place	**Frames numbers featuring AU6 and AU12 in the first 30 seconds (30fps)**	**FACS details**	**Total no of frames with hedonic expression (30 fps)**	**% of frames with hedonic expressions**
Birmingham	0		0	0
Brighton	0		0	0
Coventry	0		0	0
Derby	0		0	0
Leeds	0		0	0
Peterborough	0		0	0
Salisbury	0		0	0
Sunderland	0		0	0
York	0		0	0
Andalucía	124 – 180 288 - 314	AU6AU12AU25 AU6AU12AU25	92	13%
Bulgaria	0		0	0
Croatia	0		0	0
Cyprus	251 - 280 467 - 473 1219 – 1246	AU6AU12AU25 AU6AU12 AU6AU12AU25	62	8%
Greece	151 - 171 429 - 453	AU6AU12 AU6AU12	44	6%
Isle of Man	349 - 360 603 - 622 1006 - 1030 1033 - 1049 1201 - 1234 1235 - 1258	AU6AU12AU25 AU6AU12AU25 AU6AU12 AU6AU12AU25 AU6AU12 AU25+AU6AU12	126	13%
Jersey	0		0	0
Malaysia	243 - 303	AU6AU12AU25	60	8%
Mauritius	58 - 78	AU6AU12AU25	20	3%
New Zealand	332 - 355 409 – 417 430 - 469 524 - 570 586 - 612	AU6AU12AU25 AU6AU12AU25 AU6AU12AU25 AU6AU12AU25 AU6AU12AU25	142	19%
Spain	39 - 71	AU6AU12AU25	32	6%

Table 16: place adverts and details of the hedonic faces in the advert

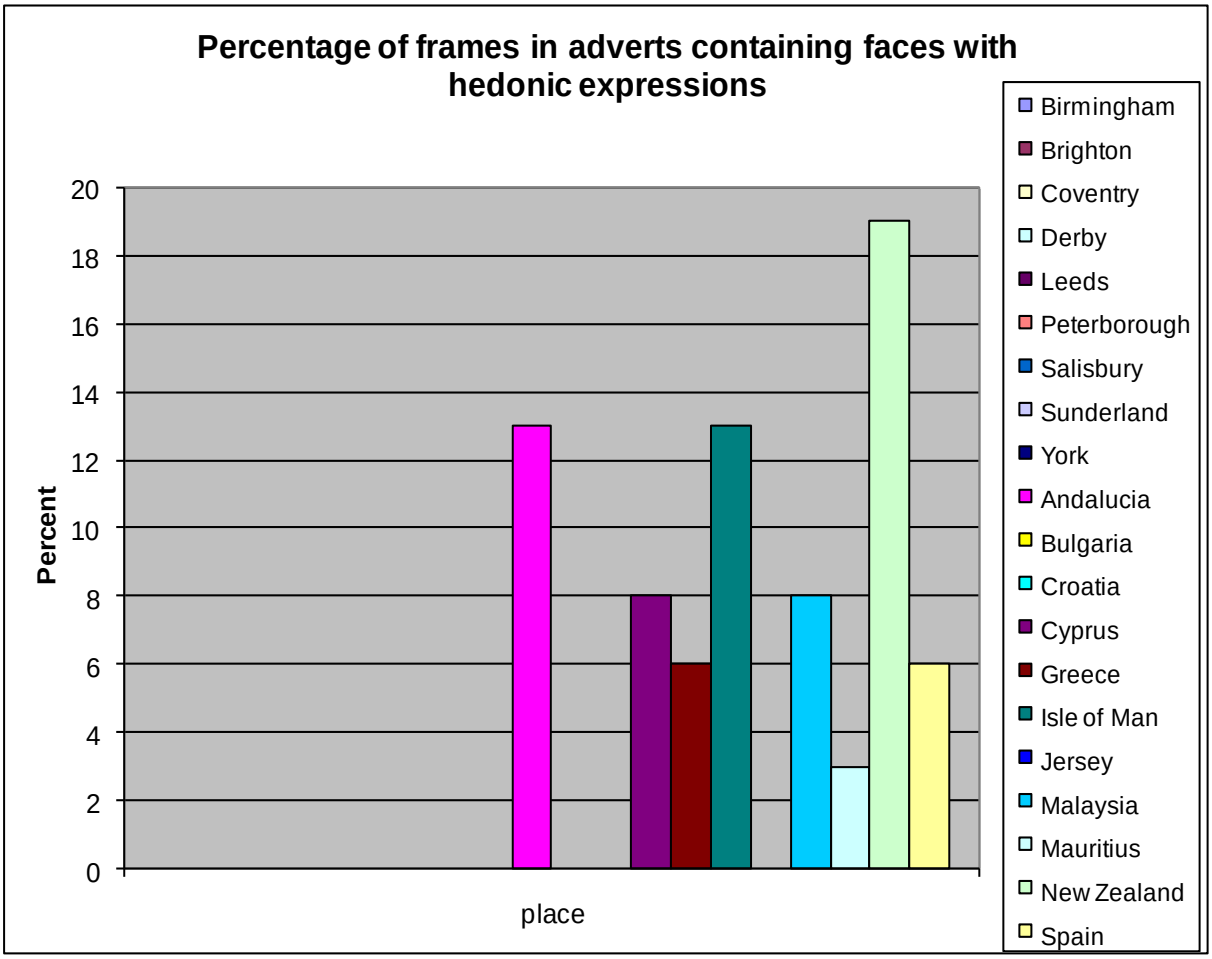

Figure 34: bar chart showing hedonic faces on the screen as a percentage of the whole advert

The places were ranked according to the amount of happy faces shown in the advert (see Table 17)

Place	Percentage of frames featuring happy faces	Rank
Andalucia	13	=2
Cyprus	8	=4
Greece	6	=6
Isle of Man	13	=2
Malaysia	8	=4
Mauritius	3	8
New Zealand	19	1
Spain	6	=6

Table 17: rank order of places including happy faces

d) Discussion of Content Analysis results

On the whole the results were positive. This content analysis was designed to test for criteria identified as expressing hedonic emotion. These criteria were fulfilled in the place

adverts in above 50% of the case for music (65%) and voice (69%). Faces were less conclusive with only 40% of the adverts containing this criteria.

Taken together, the order of tourist adverts with the most identified hedonic stimuli the order of videos is as in Table 18. Acknowledging that the variables here are by no means conclusive and that other variables in the texts may affect emotions hedonically, the presence of the ones in voice, music and faces can be seen as indicative of a desire to elicit hedonic response in the viewer by place marketers. As Table 18 shows, the place advert with the highest level of hedonic content is Isle of Man, followed by New Zealand, Andalucía, Spain etc. It is noticeable that in the top 10 adverts only two (Birmingham and Isle of Man) are from the UK.

Rank in order of use of hedonic stimuli	Place	Voice	Music	Face	Overall
1	**Isle of Man**	8	6	13	27
2	**New Zealand**		5	19	24
3	**Andalucía**	7		13	20
4	**Spain**	9		6	15
5	**Croatia**	8	5		14
=6	**Mauritius**	7	4	3	14
=6	**Greece**	5	4	6	15
=8	**Birmingham**	8	4		12
=8	**Bulgaria**	8	4		12
=8	**Cyprus**		4	8	12
=8	**Malaysia**		4	8	12
12	**Coventry**	8	3		11
13	**York**	11			11
14	**Jersey**	9			9
15	**Peterborough**	8			8
16	**Leeds**		7		7
17	**Sunderland**	5			5
18	**Brighton**		5		5
19	**Derby**		5		5
20	**Salisbury**				0

Table 18: Amount of all three hedonic stimuli with the places ranked according to their presence

6.3 Biofeedback results

Having shown the procedure and results of content analysis, this section will do the same for the biofeedback experiments.

The recruitment was done at the beginning of a lecture and by email. The researcher handed out letters (see Appendix Ten) with copies of all of the forms explaining intentions inviting them to take part and giving details of how they can volunteer. The letter gave details of the experiment as well as assurances of confidentiality, safety and the freedom to decline any part of the experiment at any time. It stressed the voluntary nature of the experiments and that they were disconnected from their studies.

Ethical considerations were investigated and resolved by a thorough assessment by Leicester University's Ethics Committee. The major considerations were not so much the equipment and the involvement of electrical charges as these were small, the ProComp Infiniti used in other universities in the UK[38] and elsewhere. The ethics of asking personal questions and dealing with the information was more of an issue as sensitive data was collected such as drug use and emotional states. The findings of the control measures were anonymised, each subject being given a number. The details connecting the names and the numbers were kept in a locked filing cabinet for a year and then destroyed. There was a feedback sheet (see Appendix 11) in case of any problems and it was made very clear that the subjects could withdraw at any stage. There was also the ethical issue of this being seen as compulsory as it was handed out within the students' course time so written assurances were made and these were repeated verbally when the subject was in the experiment room that they were not connected.

[38] For example, Sheffield University, see http://www.shef.ac.uk/reflex/about/hardware/procomp.html

The rooms were all in the University of Leicester in familiar surroundings to the subjects. Each room was laid out the same with two laptops[39] a metre apart connected to ProComp Infiniti on a main with a chair next to one of the laptops. On another table were the control measure forms with a chair. On each laptop was a preloaded ten minute video containing 20 audio-visuals at approximately 30 seconds each which ran in alphabetical order: Andalucía, Birmingham, Brighton, Bulgaria, Coventry, Croatia, Cyprus, Derby, Greece, Isle of Man, Jersey, Leeds, Malaysia, Mauritius, New Zealand, Peterborough, Salisbury, Spain, Sunderland and York (see CD in Addendum).

This experiment was done individually, one person at a time. The control measure forms were completed, there was an explanation of the experiment, repeating subjects in the letter including the ability to withdraw at any stage. The subject then went to the chair, headphones were put on, then electrodes attached to the face in the near the laptops and the biofeedback measurements began with a two-minute pretest where the subject watched a blank screen

Having explained the experiment procedure, there follows the results of the experiment. Each of the biofeedback responses is reported separately: (a) SC (b) EMG and (c) HR. The results of (d) all three measures are then discussed.

a) SC

This section shows the results skin conductance experiments. There was great variability in the base level of skin conductance (recorded while each subject watched a blank screen for two minutes before watching the videos) from 0.827 micro Siemens (**µS**) to 11.9 **µS** so it was important therefore to measure each case comparatively.

[39] The laptops were a Dell and Toshiba, each loaded with Windows XP operating systems, 500Mb RAM and over 50Gb memory

On the whole, the figures for SC suggested a decline while watching the adverts. There were 262 SC readings below the pre-test means out of 400. This means in 66% of the cases the adverts resulted in an indicator of hedonic effect. The pattern of declination of SC was particularly interesting as generally while watching the adverts as a whole, the SC rate declined. While it is possible to interpret this as the result of habituation (possibly boredom) or generally calming down, individual adverts resulted in changes so the subjects were clearly focused on the screen and ready to respond emotionally to the stimuli. Furthermore, some adverts resulted in responses that were not part of a general declination pattern such as Bulgaria where there were 13 out of 20 responses below the pre-test means preceded and followed by adverts with 9 out of 20 responses below the pre-test means. Subjects varied between adverts with Subject 6, for example mostly registered a mean SC response of around 11 µS but for New Zealand this rose to 13 µS.

Figure 35 shows the SC of the subjects generally fell while watching the adverts. The overall means for 16 out of 20 subjects while watching the adverts was lower than under pre-test conditions. One biofeedback measure on its own does not indicate any particular emotion but what can be concluded is the individuality of response (see Appendix 12 for details of the SC responses), the general level of decline of SC while watching the adverts and that the adverts reduced the SC level on the whole.

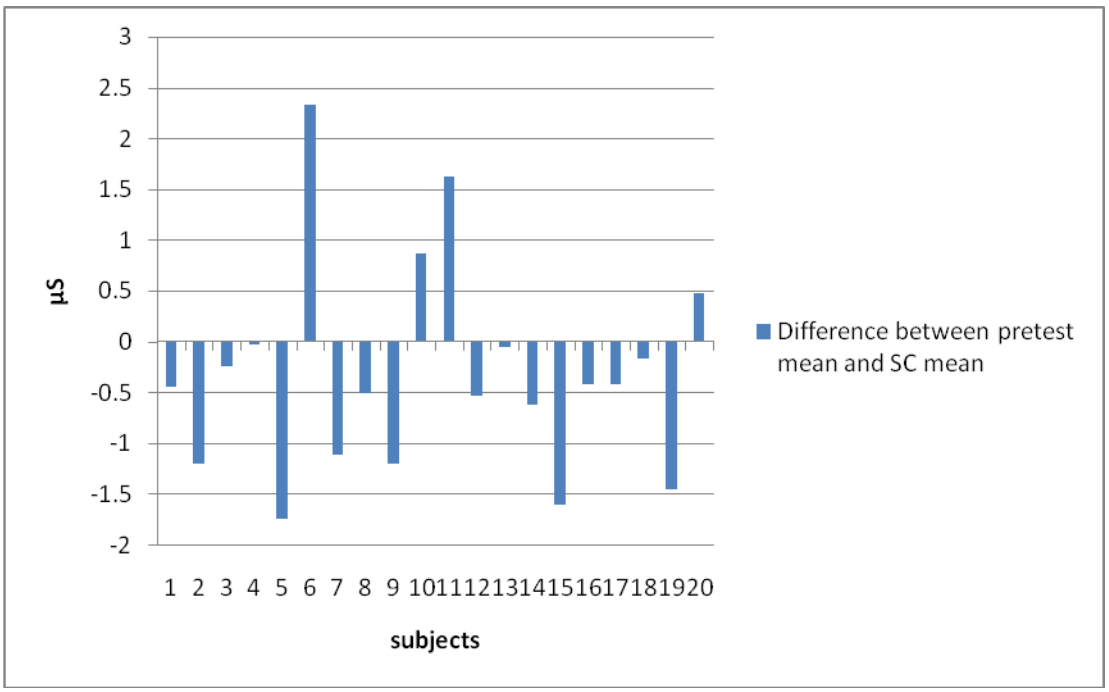

Figure 35: comparison of pre-test mean SC scores between pre-test and adverts

A paired sample t-test between the all subject SC means during the pretest compared to all subject SC scores while watching the adverts showed that although there were differences between the two results it was not seen to be significant (t=-1.258, df=19, p=.224).

b) EMG

The last section showed and discussed the results to the first of three biofeedback measures. This section shows and describes the electromyograph responses to the advert starting with the subjects then place.

The line graphs do not reveal any pattern of response (See Appendix 13 for details of the EMG responses) suggesting that the emotional reactions to an advert are very individual. There were, peaks in many adverts and all subjects registered sharp increases in EMG activity which is an indicator of hedonic feeling. These peaks were experienced during every advert by at least one subject so there was no advert which did not elicit a hedonic facial response.

There was a decline in response of EMG from 14 over the pre-test means for Andalucía to 5 for York it may be that the adverts gained increasingly less hedonic responses but the steady pattern more suggests the subjects became desensitised or perhaps even bored with the sense of repetition. This was not a steady declination, though, Cyprus rising from the previous adverts 9 to 12 and Peterborough from 8 means above pre-test in the previous advert to 10. The individual texts are able to elicit particular responses.

Overall the results are not totally conclusive with 174 means above the pre-test means in just 44% (174 out of 400) of cases. The overall mean in Figure 36 shows the difference between the mean scores for each subject from the EMG tests in comparison with their EMG pre-test scores. In 60% (12 out of 20) cases the overall means of the responses by the subjects were above the pre-test means. This can be explained as EMG results in high peaks so although they may not have happened in too many adverts, when they do occur they increase the overall mean significantly. However, for EMG as a whole there were mixed results and it cannot be concluded that this indicator demonstrated a hedonic effect.

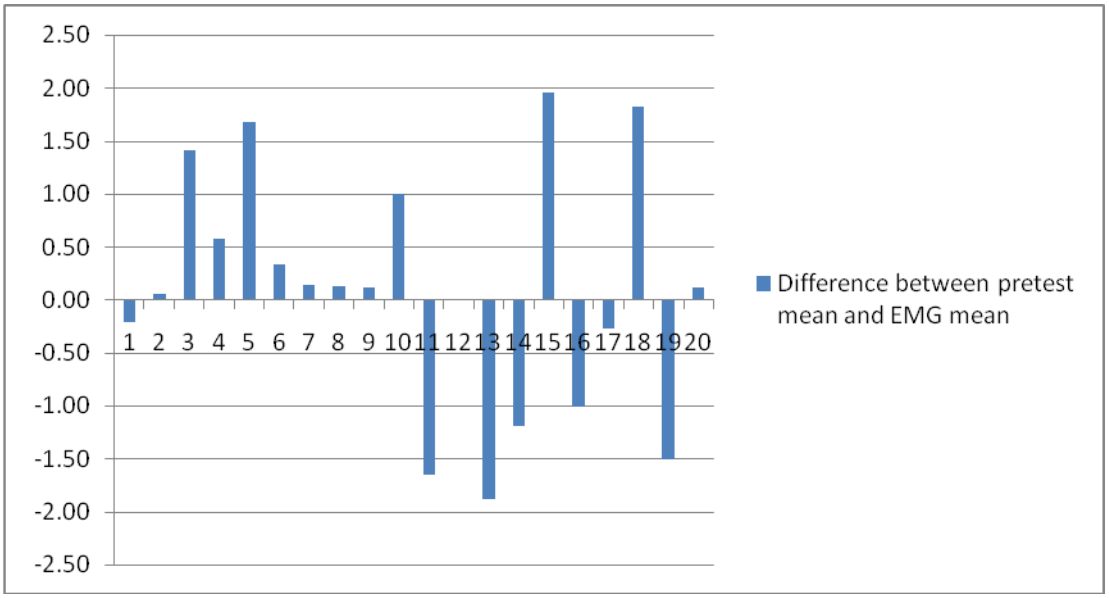

Figure 36: difference between the means for all adverts by each subject compared with the pre-test means

A paired sample t-test between the EMG scores in the pretest and the EMG scores while watching the adverts showed that the difference between them was not seen as significant (t=.139, df=19, p=.891).

c) HR

The last two sections revealed and discussed the results of the SC and EMG responses to the adverts. Using the same format this section shows and discusses the results of the HR results, first by subject then by place followed by overall results and discussion.

As with the previous two biofeedback response results, the subjects varied considerably in their HR changes. There was no overall pattern or time or place when the HR increased or decreased suggesting again that the emotional response to an advert is an individual affair (see Appendix 14 for details of the HR responses). Overall, the results showed an increase in HR in 57% of the cases (229 out of 400) which suggests that the place adverts increases this indicator of happiness albeit slightly. Figure 37 shows that 12 out of 20 subjects had an increase in mean HR above their pre-test scores while watching the adverts.

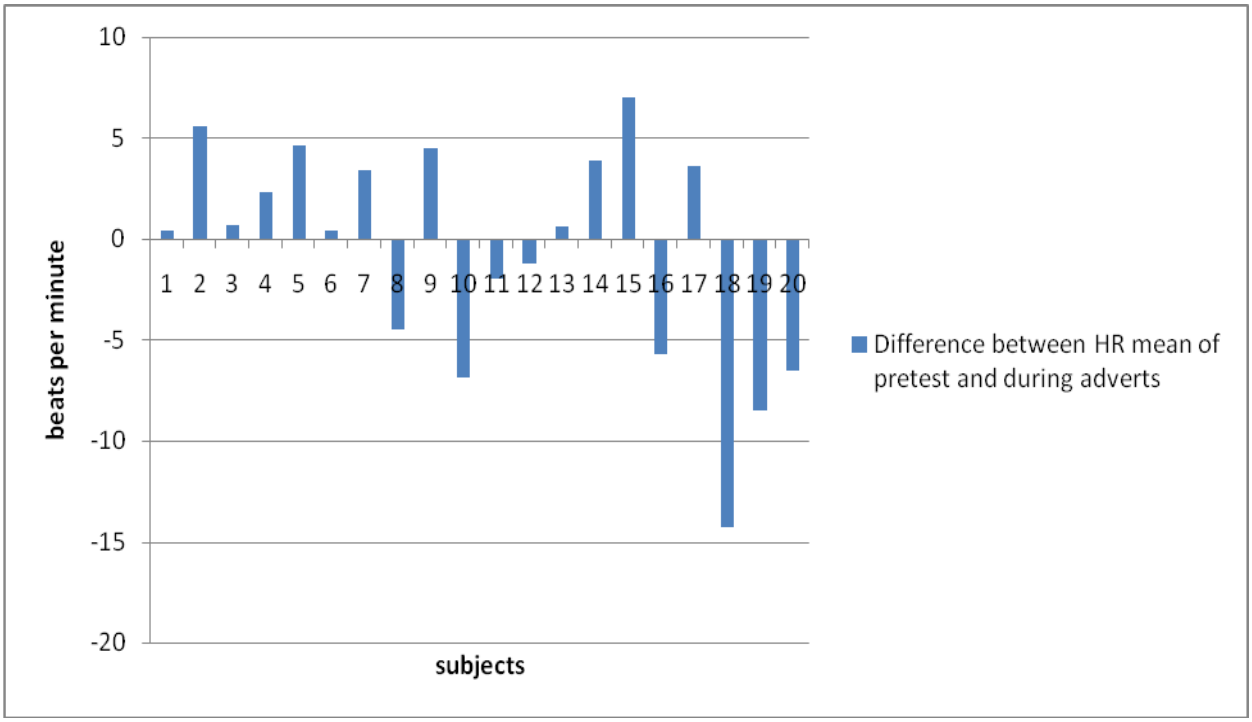

Figure 37: comparison of mean HR responses by all subjects between pre-test and adverts

A paired sample t-test was performed on the means of all the subjects HR results while in the pretest compared to the means of all subject HR results while watching the adverts but the difference between them was not seen to be significant (t=-1.378, df=19, p=.184).

d)All three biofeedback measures together

Having shown the results of each stimulus and biofeedback measure separately this section reveals the overall results of all three dependent variables.

Figure 38 shows the responses all together. SC should be the only bar that is below the line with hedonic expression. In Subject 1, 13, 14, and 17's case HR was also below the line while Subjects 3, 8, 10 and 11 had EMG below the line. Subject 6 had SC above the line as did Subjects 10 and 11. Subjects 16 and 19 had all indicators below the line.

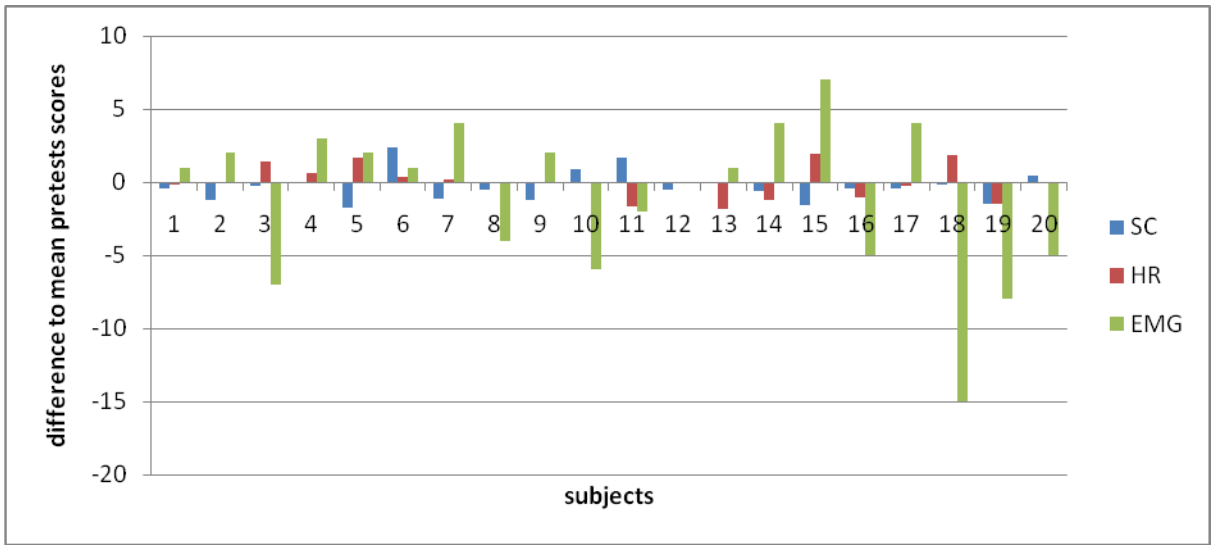

Figure 38: changes in means from pre-tests for all three biofeedback measures

Figure 39 shows the amount of adverts each subject responded in a way which suggests a hedonic response using all three indicators. Each score is based on a mean reading of all their responses to HR, SC and EMG and comparing them to the means for the pre-tests for each of

these measures. When the subject registered an increase in HR and EMG and a decrease in SC for the advert it is indicated by a score on the graph. Only Subject 11 did not respond to any of the 3 indicators of hedonic expression. Subjects 10, 12, 17, 18 and 20 responded with only one indicator of hedonic expression. All other subjects responded with 2 or more indicators with subjects 2, 3, 4, 5, 7, 9 and 15 responding to the adverts in a hedonic manner. In all there were 40 positive responses out of a possible 60 giving a 67% result. This figure indicates that generally the adverts produced a hedonic effect.

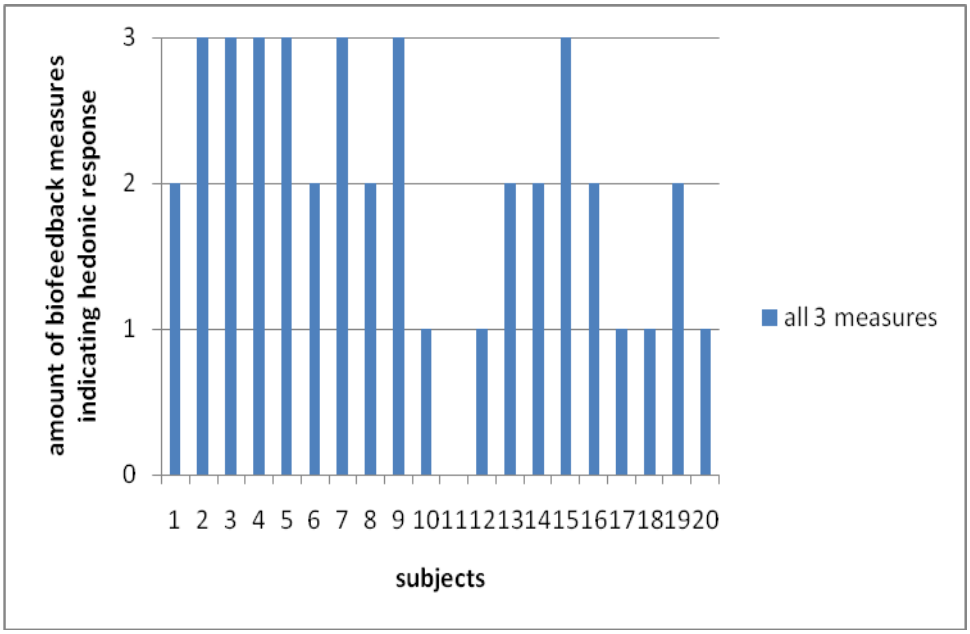

Figure 39: amount of biofeedback measures each subject responded in a hedonic manner

Table 19 shows the rank order of the results of the three measures of biofeedback. To discover whether there was any correlation between these rankings a Spearman's rho test of correlation was undertaken. The results showed that there was no significant correlation between the rank orders of SC and EMG (rho=-.287, N=20, p=.219, two-tailed). There was also no significant correlation between SC and HR (rho=-.007, N=20, p=.977, two-tailed).

There was also no significant correlation between EMG and HR (rho=-.275, N=20, p=.240, two-tailed).

Rank Order	SC	EMG	HR
1	Mauritius	Peterborough	Peterborough
2	Jersey	Andalucía	Malaysia
3	New Zealand	Croatia	Salisbury
4	Isle of Man	Birmingham	Spain
5	Leeds	Coventry	Sunderland
6	Malaysia	Leeds	Cyprus
7	Greece	Mauritius	Leeds
8	Salisbury	New Zealand	Croatia
9	York	Bulgaria	Birmingham
10	Sunderland	Isle of Man	Brighton
11	Spain	Jersey	Bulgaria
12	Peterborough	Malaysia	York
13	Derby	Cyprus	Jersey
14	Coventry	Brighton	New Zealand
15	Bulgaria	Spain	Greece
16	Cyprus	Greece	Isle of Man
17	Croatia	Sunderland	Mauritius
18	Brighton	Derby	Coventry
19	Birmingham	Salisbury	Derby
20	Andalucía	York	Andalucía

Table 19: rank order of all places by biofeedback total scores

The rank order of all place adverts according to hedonic biofeedback response is shown in Table 20.

Rank	Place Advert
1	Peterborough
2	Leeds
3	Malaysia
4	Mauritius
5	New Zealand
6	Jersey
7	Croatia
8	Birmingham
9	Spain
10	Isle of Man
11	Salisbury
12	Sunderland
13	Bulgaria
14	Cyprus
15	Coventry
16	Greece
17	York
18	Andalucía
19	Brighton
20	Derby

Table 20: rank order of places from all three biofeedback measures

6.4 Self-report tests results

Having reported the results from the biofeedback experiments and shown that there is some evidence of hedonic expression from the subjects this section reports the procedure and results of the self-report responses.

The subjects moved the cursor over the area which corresponded with their feelings while watching the adverts[40]. The results were recorded and reported below. Positive feelings of happiness are demonstrated by moving the cursor to the top right segment of Feeltrace (a representation of the screen is shown in Figure Four) and this is recorded by a

[40] The difference in amount of numbers registered on the chart is because the subjects had freedom of movement and moved the cursor at different times. Every time the subject moved the mouse a new figure was recorded.

positive integer on the horizontal plane. Negative feelings are a minus integer on the horizontal plane. The bottom half of the circle records more passive feelings. Contentment and positive emotions will result in the cursor being in the bottom right segment and recorded as a negative integer on the vertical plane. Negative passive emotions such as boredom are shown by placing the cursor in the bottom left segment and recorded as a negative integer on the vertical plane. If, then, the cursor is moved mainly around the top right segment resulting in a positive integer on the horizontal and vertical planes then this is indicative of hedonic emotion being felt by the user of Feeltrace.

The overall means for the responses to the videos by the subject was positive (vertical = +.4899; horizontal =+.2861). This is indicated on the Feeltrace wheel by a red spot in Figure 40. Therefore, overall, the subjects considered themselves to be in a hedonic state while watching the audio-visuals. There were very few instances of movement into the top left segment while watching the video suggesting the subjects did not feel negative feelings while watching the adverts. The vast majority of responses were in the top right segment indicative of hedonic feeling. For most subjects the cursor was mainly in the spot indicative of happiness. There was some movement along the vertical plane towards contentment and positive passive feelings. From these results it can be concluded that the subjects felt happy while watching the adverts.

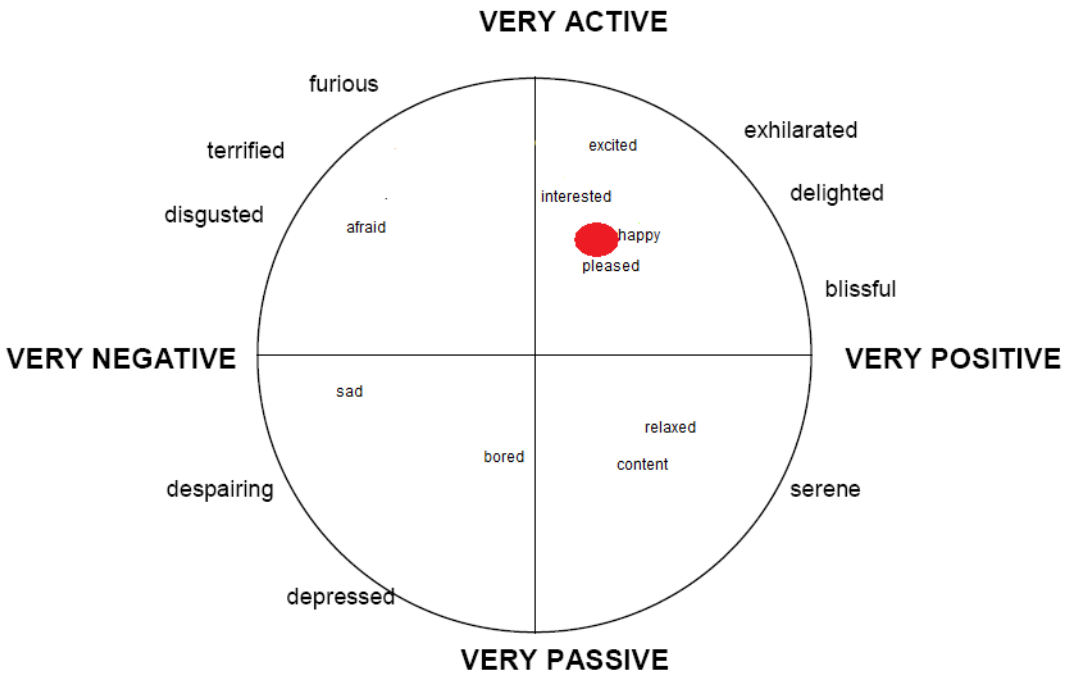

Figure 40: the average position of the cursor for all subjects

Taking the position of +4, +4 around the word 'happy' as an indicator of viewer hedonic feeling, the responses could be ranked according to the mean vertical and horizontal scores. This would not produce an ideal record of hedonic feeling as it does not take into account the level of hedonic emotional experience - delighted, for example deviating considerably from the +4 position. Nevertheless, it could be used to demonstrate how far the viewer, on average, deviated from the central hedonic space. Table 21 shows the ranking of places using this method.

Place	Mean Vertical	Mean Horizontal	Ranking
Andalucia	.59	.11	16
Birmingham	.59	.16	11
Brighton	.55	.23	9
Bulgaria	.45	.37	2
Coventry	.36	.49	5
Croatia	.35	.38	4
Cyprus	.45	.24	7
Derby	.25	.47	8
Greece	.40	.36	1
Isle of Man	.44	.24	6
Jersey	.47	.01	14
Leeds	.49	-.04	18
Malaysia	.51	.04	15
Mauritius	.46	-.13	20
New Zealand	.48	-.06	19
Peterborough	.48	.03	13
Salisbury	.41	.32	3
Spain	.59	.11	17
Sunderland	.59	.16	12
York	.55	.23	10

Table 21: ranked results of the self-report results for each advert

6.5 Connections between individual attributes and biofeedback responses

Having reported the results of the content analysis, biofeedback and self-report responses, and the connections between the stimuli in the advert and the responses, this section will consider whether any of the individual attributes might be linked to emotional response. Due to the different nature of the stimuli and responses, correlations were assessed by nonparametric testing using a two-tailed Spearman rho bivariate correlation analysis starting with (a) voice, followed by (b) music and (c) face.

a) Voice and biofeedback

An analysis of voice-over attributes with the biofeedback results showed only one significant result. There was one significant correlation between F1 formant pitch level and biofeedback responses (rho=-.670, N=13, p=.012, two-tailed).

Otherwise, there was no significant correlation between the presence of hedonic voice-over and skin conductance (rho=-.155, N=12, p=.568, two-tailed). There was no significant correlation between the presence of hedonic voice-overs and EMG response in the viewers (rho=.356, N=12, p=.230, two-tailed). There was no significant correlation between the presence of hedonic voice-overs and HR response (rho=.091, N=12, p=.779, two-tailed).

A comparison of the rank order of mean voice pitch against rank order of biofeedback response resulted in no significant link (rho=.033, N=13, p=.915, two-tailed). There was a similarly no-significant result for declination (rho=-.234, N=13, p=.442, two-tailed), pitch range (rho=-.093, N=13, p=.762, two-tailed), syllable speed (rho=-.242, N=13, p=.426, two-tailed), amount of stressed words (rho=.071, N=13, p=817, two-tailed), jitter (rho=.379, N=13, p=.201, two-tailed), peak pitch (rho=-.192, N=13, p=.529, two-tailed) and length from start of sentence to sentence peak (rho=-0.41, N=13, p=.894, two-tailed).

A comparison of the rank order of self-report results and rank order of adverts by the amount of hedonic voice qualities showed no significant link (rho=-.349, N=13, p=.242). Comparisons between the rank order of the place adverts by use of the attributes of voice expressing hedonic emotion also yielded no significant results: pitch (rho=-.258, N=13, p=.394); declination (rho=.091, N=13, p=.768); pitch range (rho=-.121, N=13, p=.694); syllable speed (rho=-.330, N=13, p=.271); amount of stressed words (rho=.038, N=13, p=.901); jitter (rho=.236, N=13, p=.437); accent peak (rho=-.121, N=13, p=.694); sentence length to peak (rho=-.129, N=13, P=.674).

b) Music and biofeedback

The correlation results of the music in the place adverts by viewer biofeedback response brought one significant result. There was a significant correlation between the amount of major sequences in the music and hedonic biofeedback response (rho=.698, N=13, p=.008, two-tailed).

Otherwise, there was no significant correlation between the presence of hedonic music and SC response in viewers (rho = .226, N=17, p=.384, two-tailed). There was no significant correlation between the presence of hedonic music and EMG response in viewers (rho=.014, N=12, p=.966). There was no significant correlation between the presence of hedonic music and HR response in viewers (rho=-.077, N=12, p=.812, two-tailed). There were also no significant correlations between attributes of voice and the biofeedback responses. A comparison of the rank order of place adverts by speed of notes and biofeedback responses showed no significant link (rho=0.259, N=13, p=0.394, two-tailed). There was a similar situation for all other attributes of hedonic music with no significant correlation between standard deviation of notes and biofeedback responses (rho=.82, N=13, p=.789, two-tailed), melodic range and biofeedback response (rho=.38, N=13, p=.901, two-tailed), major sequences and biofeedback responses (rho=-.357, N=13, p=.231, two-tailed) or rising pitch (rho=.324, N=13, p=.280, two-tailed).

c) Face and biofeedback

A paired T-test was performed comparing the mean results of all subjects' biofeedback responses while watching the advert as a whole and the mean results of all subjects' biofeedback responses while watching the advert with happy faces on the screen. There were two examples of a significant correlation between a biofeedback response and happy faces. The HR results of Mauritius showed a significant effect of the faces on the screen (t=2.440, df=19, p=.024) as did the SC results of the Cyprus advert (t=-3.360, df=19, p=.003).

Otherwise the differences between the two scores between HR and the stimulus were not significant: Andalucia (t=.130, df=19, p=.898); Cyprus (t=.976, df=19, p=.341); Greece (t=1.132, df=19, p=.272); Isle of Man (t=1.069, df=19, p=.299); Malaysia (t=-.674, df=19, p=.509); New Zealand (t=-1.280, df=19, p=.216); Spain (t=.764, df=19, p=.454).

For SC the place adverts recorded figures showing the differences between the means were insignificant: Andalucia (t=.265, df=19, p=.794); Greece (t=.539, df=18, p=.596); Isle of Man (t=-.281, df=19, p=.782); Malaysia (t=.018, df=19, p=.986); Mauritius (t=1.467, df=19, p=.159); New Zealand (t=.067, df=19, p=.948); Spain (t=-.096, df=19, p=.925).

For EMG the differences were also not significant: Andalucia (t=1.526, df=19, p=.144); Cyprus (t=.456, df=19, p=.654); Greece (t=-.615, df=19, p=.546); Isle of Man (t=.593, df=19, p=.560); Malaysia (t=-.668, df=19, p=.512); Mauritius (t=.228, df=19, p=822); New Zealand (t=-.481, df=19, p=.636); Spain (t=-1.190, df=19, p=.249).

6.6 Time-based comparison of stimuli with biofeedback responses

Having reported that the biofeedback responses to the place adverts resulted in an overall increase in the indicators of hedonic emotion, confirmed by the reported emotion but that there could be found few significant correlations between the amount of stimuli and the amount of hedonic response, this section explores whether there are time-related links between the adverts and responses. By sectioning the adverts and responses into five-second blocks it can be seen whether the nature of the content for three stimuli – voice, music and faces - in these blocks affected the responses. This section explores the correlation results by (a) voice, (b) music and (c) face.

a) Voice

The mean biofeedback results for all the responses to the adverts containing voice-overs were collected and compared to the stimuli in the adverts to see if there could be found a link between them. The adverts and the responses were broken up into five-second blocks to allow for a non parametric comparison of results. Table 22 shows the ranked results for

each section for voice-overs. Only one significant correlation was found between F1 pitch mean and HR (rho=.829, N=6, p=.042, two-tailed).

Seconds of advert/response	Ranked by highest pitch mean	Ranked by highest pitch range	Ranked by highest jitter	Ranked by highest peak pitch	Ranked by amount of voiced frames	Ranked by F1 pitch mean	Ranked by F2 pitch mean	Ranked HR to adverts with voice-overs	Ranked SC to adverts with voice-overs	Ranked EMG to adverts with voice-overs	Ranked by all three biofeedback responses together
1 = 0-5	3	2	6	5	6	6	3	6	4	4	5
2 = 6-10	2	1	2	1	3	3	6	2	6	2	3
3 = 11-15	5	3	3	2	5	2	1	1	1	1	1
4 = 16-20	4	4	4	4	4	1	4	3	2	3	2
5 = 21-25	6	5	5	6	2	4	5	4	3	6	4
6=26-30	1	6	1	3	1	5	2	5	5	5	6

Table 22: rank orders of the vocal stimuli and the biofeedback responses to the adverts in five second blocks

There were no significant correlations between the pitch-level and HR results nor the pitch range and HR which both resulted in a spearman's rho correlation of (rho=.314, N=6, p=.544, two-tailed) despite different rankings. No significant correlation was found between HR and jitter level (rho=.371, N=6, p=.468, two-tailed) nor HR and pitch peak (rho=.657, N=6, p=.156, two-tailed). A test was performed to see whether the amount of voice-over in a section might affect HR but no correlation was found between this biofeedback measure and voiced frames (rho=-.086, N=6, p=.872, two-tailed).

There were no signs of a correlation between SC and F1 pitch means (rho=.543, N=6, p=.266, two-tailed). There was no significant correlation between EMG and F1 means in the voice-overs (rho=.600, N=6, p=.206, two-tailed). There was no significant correlation between F2 mean and SC (rho=.486, N=6, p=.329, two-tailed) nor for EMG (rho=.200, N=6, p=.704, two-tailed). Unlike for F1 HR had no significant correlation with biofeedback responses (rho=-.029, N=6, p=.957, two-tailed).

There were signs of a correlation between the pitch mean and SC but it could not be called significant (rho=-.771, N=6, p=0.72, two-tailed). There was no correlation between the pitch range and SC (rho=-.200, N=6, p=.704, two-tailed) nor jitter level (rho=-.371, N=6, p=.468, two-tailed). The peak pitch also brought no significant correlation with SC (rho=-

.257, N=6, p=.623, two-tailed) and the same result could be found for the amount of voiced frames (rho=-.429, N=6, p=.397, two-tailed).

b) Music

The results of the biofeedback experiments were also compared with the amount of musical stimuli in the adverts by blocking adverts and responses into five-second sections. The results were ranked to allow for a Spearman's rho correlation analyses to be performed. There were no significant correlations found. The results of the ranking can be seen in Table 23.

Seconds of advert/responses	Ranked number of rising notes	Ranked amount of major key sequences	Ranked number of short note movements from 1 to 4	Ranked standard deviation of notes	Ranked number of notes per second	Ranked EMG responses to adverts with music	Ranked SC responses to adverts with music	Ranked HR responses to adverts with music
1 = 0-5	2	1	2	1	6	3	4	4
2 = 6-10	6	2	3	2	5	1	3	3
3 = 11-15	1	5	6	4	4	2	2	5
4 = 16-20	4	6	5	5	2	4	1	2
5 = 21-25	3	4	4	3	1	5	5	6
6 = 26-30	5	3	1	6	3	6	6	1

Table 23: rank orders of the musical stimuli and the biofeedback responses to the adverts in five second blocks

There was no significant correlation between the number of rises in the sections and the mean HR responses (rho=-.657, N=6, p=.156, two-tailed). There was no significant correlation between HR responses and sections with major key sequences (rho=.028, N=6, p=.957, two-tailed). There was also no significant correlation between the sections with a high number of rising notes and HR responses (rho=.486, N=6, p=.329, two-tailed) nor by sections with a high level of note variation (rho=.257, N=6, p=.623, two-tailed). Likewise when the sections were ranked for the standard deviation between notes to discover whether high variation would affect biofeedback responses, the results were no significant correlation (rho =-.543, N=6, p=.266, two-tailed) and for the number of notes per section (rho=-.086,

N=6, p=.872, two-tailed). There was also no significant correlation between the number of notes per section and the EMG responses (rho=-.657, N=6, p=.156, two-tailed)

EMG responses were ranked in five-second blocks and compared to the blocks of the adverts which contained hedonic stimuli. As with HR there were no significant correlations. For major keys, the results were (rho=.200, N=6, p=.704, two-tailed). No significant correlation was found between the number of rises in the advert and EMG responses (rho=.086, N=6, p=.872, two-tailed) nor for note-movement in the first half of the octave (rho=.371, N=6. P=.468, two-tailed). A large variation in notes pitches for the section also resulted in no significant correlation with EMG responses (rho=.314, N=6, p=.544, two-tailed) and likewise a higher standard deviation between the note pitches results in no significant correlation (rho=.600, N=6, p=.208, two-tailed).

The same results were discovered for SC responses. For major key sequences there was no significant correlation with EMG responses (rho=-.543, N=6, p=.266, two-tailed) nor with amount of rising pitches (rho=.200, N=6, p=.704, two-tailed). The density of notes in each section showed some leaning towards a correlation (rho=-.771, N=6, p=.072, two-tailed) nonetheless it was still not significant. No such connection could be found for pitch variation in the sections (rho=.029, N=6, p=.957, two-tailed) nor the standard deviation between notes (which had the same result of (rho=.029, N=6, p=.957, two-tailed) despite the different rankings). Skin conductance was also not significantly altered in a hedonic direction for the number of notes per section (rho=-.086, N=6, p=.872, two-tailed).

c) Face

By ranking the five-second sections of the adverts by the amount of hedonic faces on the screen and the biofeedback responses for adverts which contained faces it was possible to discover whether there was a correlation between the two. A Spearman's rho correlation test was performed on these sets of data. Correlation analyses found no significant links between

the amount of faces on the screen and the biofeedback responses for adverts with faces on the screen. Table 24 shows the rank order of the amount of faces on the screen and the level of hedonic responses.

Seconds of advert/responses	Rank order of amount of faces on screen	Rank order of HR responses	Rank order of SC responses to adverts with faces	Rank order of EMG responses to adverts with faces	Rank order of all biofeedback responses to adverts with faces
1 = 0-5	4	6	3	4	6
2 = 6-10	5	4	5	2	4
3 = 11-15	1	2	6	3	1
4 = 16-20	3	3	4	1	3
5 = 21-25	2	5	2	6	5
6 = 26-30	6	1	1	5	2

Table 24: rank orders of the facial stimuli and the biofeedback responses to the adverts in five second blocks

For HR responses there was no significant correlation (rho=-.143, N=6, p=.787, two-tailed). A correlation was not in evidence for EMG (rho=.029, N=6, p=.957, two-tailed) nor SC (rho=-.486, N=6, p=.329, two-tailed).

d) Time-based comparison of stimuli with self-report responses

The Feeltrace data was collected and the average position throughout the advert could be ascertained at every five seconds. An average of all the scores from the position of the cursor between five-second blocks was collected. These were then compared to the stimuli on the screen in the adverts to see whether the subjects responded to them emotionally. Each direction of the cursor (horizontal and vertical) was taken separately and the five-second blocks were ranked according to how high the average number was in both directions – a positive integar being indicating positive feeling. Table 25 shows the ranked results from self-report response and stimuli attributes. There three significant correlations for music: key was the first (rho=-.943, N=6, p=.005, two-tailed); small note changes was the second (rho=-.829, N=6, p=.042, two-tailed) and number of notes per section the third (rho=.943, N=6, p=.005, two-tailed).

Seconds of advert/responses	Ranked self-report responses	Ranked number of rising notes	Ranked amount of major key sequences	Ranked number of short note movements	Ranked SD of notes	Ranked number of notes per second	Ranked by highest pitch mean	Ranked by highest pitch range	Ranked by highest jitter	Ranked by highest peak pitch	Ranked by amount of voiced frames	Ranked by F1 pitch mean	Ranked by F2 pitch mean	Rank order of amount of faces on screen
1 = 0-5	6	2	1	2	1	6	3	2	6	5	6	6	3	4
2 = 6-10	5	6	2	3	2	5	2	1	2	1	3	3	6	5
3 = 11-15	1	1	5	6	4	4	5	3	3	2	5	2	1	1
4 = 16-20	2	4	6	5	5	2	4	4	4	4	4	1	4	3
5 = 21-25	3	3	4	4	3	1	6	5	5	6	2	4	5	2
6 = 26-30	4	5	3	1	6	3	1	6	1	3	1	5	2	6

Table 25 showing the rank orders of all stimuli and Feeltrace responses to the adverts in five second blocks

There were no significant correlations between the recorded emotional feeling and the stimuli for voice: pitch (rho=-.600, N=6, p=.208, two-tailed); standard deviation of notes (rho=-.371, N=6, p=.468, two-tailed); jitter (rho=.143, N=6, p=.787, two-tailed); peak accent (rho=.086, N=6, p=.872, two-tailed); voiced frames (rho=.029, N=6, p=.957, two-tailed). There were signs of a correlation with F1 formants (rho=.771, N=6, p=.072, two-tailed) but it cannot be considered to be significant. There was no significant correlation between the reported emotions and F2 formants (rho=.371, N=6, p=.468, two-tailed). There was no correlation between the presence of happy faces on the screen and reported emotion (rho=.714, N=6, p=.111, two-tailed).

6.7 All stimuli and biofeedback

Having reported the results of the responses to the three emotional stimuli separately, this section considers whether correlations could be found between the three emotional stimuli, three biofeedback responses together and self-report responses. Having found few significant correlations between the stimuli in the adverts and the attributes of the stimuli and responses, it was unlikely that by performing a Kruskal-Wallis test on the rank of all three biofeedback responses, the self-report response against the ranking of the amount of all three

stimuli that there would result a significant correlation. There was no significant correlation between the two (X^2 =5.00, df=5, p=.416).

The rank order of the adverts from the content analysis was compared to that of the biofeedback responses to see if there was any correlation between the amount of stimuli in the adverts and emotion. Table 26 shows the rank orders side by side. A Spearman's rho correlation test on these rankings was performed in order to test if there was any significant connection between them. There was no significant correlation between the presence of hedonic stimuli and the biofeedback responses (rho=-0.137, N=20, p=.565).

Rank in order of use of hedonic stimuli	Place advert	Rank in order of biofeedback response	Place advert	Rank in order self-report response	Place advert
1	Isle of Man	1	Peterborough	1	Greece
2	Andalucía	2	Leeds	2	Bulgaria
3	New Zealand	3	Malaysia	3	Salisbury
4	Spain	4	Mauritius	4	Croatia
5	Croatia	5	New Zealand	5	Coventry
=6	Mauritius	6	Jersey	6	Isle of Man
=6	Greece	7	Croatia	7	Cyprus
=8	Birmingham	8	Birmingham	8	Derby
=8	Bulgaria	9	Spain	9	Brighton
=8	Cyprus	10	Isle of Man	10	York
=8	Malaysia	11	Salisbury	11	Birmingham
12	Coventry	12	Sunderland	12	Sunderland
13	York	13	Bulgaria	13	Peterborough
14	Jersey	14	Cyprus	14	Jersey
15	Peterborough	15	Coventry	15	Malaysia
16	Leeds	16	Greece	16	Andalucia
17	Sunderland	17	York	17	Spain
18	Brighton	18	Andalucía	18	Leeds
19	Derby	19	Brighton	19	New Zealand
20	Salisbury	20	Derby	20	Mauritius

Table 26: rank order of places according to use of hedonic stimuli and biofeedback response

In order to test the whether the three stimuli had a significant effect on three dependent variables of SC, HR and EMG responses a MANOVA was performed. These were compared to the differences in mean score of all subjects from the pretest to responses during the adverts but there was no significant effect of the amount of stimuli in the adverts

on the biofeedback scores of the viewers (F=1.38, p=.254; Wilks' Lambda=.6; partial eta squared=.216)

The adverts were ranked into three groups according to their scores (1-9 hedonic stimuli = Group 1; 10-19 hedonic stimuli = Group 2; 20-29 hedonic stimuli = Group 3) and these groups are compared to rankings of each biofeedback measure separately and the self-report results. A MANOVA was performed using the three groups as a dependent variable and the rankings of the biofeedback and self-report as independent variables but there was no significant correlation (F=.428. p=.787; Wilks' Lambda=.9)

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6.8 Results of the control measures

Having shown the results of the biofeedback and self-report tests the impact of other factors on the results will be discussed in this section first by a description of the results of the UWIST Mood Questionnaire, the Edinburgh Handedness Questionnaire, the Eysenck Personality Inventory and the Stimulant Use questions. After this, the results were compared by MANOVA with the mean scores for the self-report and biofeedback to see if there was any correlation.

As Table 27 shows, Subject 1 was right handed, in a positive mood (UWIST score 1.6) scored 26 in the Eysenck personality questionnaire and abstained from stimulants. Subject 2 was right handed, scored a positive 2.6 in the UWIST questionnaire, was on the borderline of happiness in the Eysenck results with 23 and abstained all stimulants. Subject 3 was left handed, scored a negative 1.5 in the UWIST questionnaire and correspondingly scored a 7 in the Eysenck personality questionnaire putting the subject in the depressive category and consumed one stimulant, tea. Subject 4 was right handed scored a neutral 2.3 for UWIST and was in the depressive category for Eysenck (22) s/he abstained all stimulants in the previous 24 hours to the experiment. Subject 5 also had a neutral UWIST score and

was likewise in the depressive category with the same borderline score of 22. Subject 6 had a positive UWIST score and was firmly in the happiness category of Eysenck with 26; s/he abstained all stimulants. Subject 7 was right handed, in a neutral mood and in the depressive category for Eysenck with 20; s/he consumed tea. Subject 8 was right handed had a positive UWIST score of 1.6 but was in the depressive category for Eysenck; s/he abstained all stimulants. Subject 9 was right handed, also in a positive mood with a 1.7 UWIST score and firmly in the happiness category for Eysenck; s/he had consumed 2 stimulants in the preceding 24 hours coffee and alcohol. Subject 10 was right handed in a positive mood with 2 as a UWIST score, was just in the happiness category of Eysenck and consumed 3 stimulants in the previous 24 hours, cigarettes, alcohol and Coca-Cola. Subject 11 was right handed, in a positive mood with a 1.9 UWIST score, firmly in the happiness category with 29 and abstained all stimulants. Subject 12 was right handed, in a positive mood with 1.3 but just on the borderline of the depressive category with 22; s/he had consumed tea. Subject 13 was right-handed, in a neutral mood with 2.1 UWIST score, in the happiness category of Eysenck and abstained all stimulants. Subject 14 was right handed in a negative mood with a 2.1 UWIST score and was correspondingly in the depressive personality category of Eysenck; s/he had consumed tea and cigarettes. Subject 15 was right handed, in a positive mood with a 2.1 UWIST score was in the happiness category of Eysenck (27) and abstained all stimulants. Subject 16 was right handed, in a positive mood with a UWIST score of 1.1, was in the happiness category from the Eysenck personality questionnaire and had abstained from all stimulants. Subject 17 was right handed, in a positive mood (UWIST 2.6) had a happiness rating of 27 and abstained all stimulants. Subject 18 was right handed in a positive mood (UWIST 1.6), had a happiness rating of 25 and had consumed tea. Subject 19 was right handed, had a positive UWIST score of 1.9, was in the happiness category of Eysenck and abstained from all stimulants. Subject 20 likewise abstained from all stimulants was in a

positive mood (UWIST 1.9) and was firmly in the happiness category of Eysenck with a score of 31.

Subject	Handedness	UWIST Bold and underlined signifies lowest number therefore dominant mood	Eysenck Average=22.5 7-22=depressive 23-30=happiness	Stimulants
1	Right	**Positive=1.6** Neutral=2.5 Negative=3.7	26=happiness +3.5 on average	Abstained all
2	Right	**Positive=2.6** Neutral=2.63 Negative=3.3	23=happiness +0.5 on average	Abstained all
3	Left	Positive=3.3 Neutral=2.1 **Negative=1.5**	7=depressive -15.5 on average	Abstained coffee, energy drinks, cigarettes, alcohol, other, consumed tea
4	Right	Positive=3.7 **Neutral=2.3** Negative=2.5	22=depressive -0.5 on average	Abstained all
5	Right	Positive=2.4 **Neutral=2.3** Negative=2.8	22=depressive -0.5 on average	Abstained coffee, energy drinks, cigarettes, alcohol, other, consumed tea
6	Left	**Positive=1.4** Neutral=2.1 Negative=3.2	26=happiness +3.5 on average	Abstained all
7	Right	Positive=2.8 **Neutral=2.3** Negative=3.8	20=depressive -2.5 on average	Abstained coffee, energy drinks, cigarettes, alcohol, other, consumed tea
8	Right	**Positive=1.6** Neutral=2.5 Negative=3.9	17=depressive -5.5 on average	Abstained all
9	Right	**Positive=1.7** Neutral=2.5 Negative=3.8	29=happiness +6.5 on average	Abstained tea, energy drinks, cigarettes, consumed coffee, alcohol
10	Right	**Positive=2** Neutral=2.9 Negative=3.4	24=happiness +1.5 on average	Abstained coffee, tea, energy drinks, consumed cigarettes, alcohol and Coca-Cola
11	Right	**Positive=1.9** Neutral=2.6 Negative=3.9	29=happiness +6.5 on average	Abstained all
12	Right	**Positive=1.3** Neutral=2.5 Negative=3.1	22=depressive -0.5 on average	Abstained coffee, energy drinks, cigarettes, alcohol, other, consumed tea
13	Right	Positive=2.3 **Neutral=2.1** Negative=3.6	28=happiness +5.5 on average	Abstained all
14	Right	Positive=2.9 Neutral=3.3 **Negative=2.1**	16=depressive -6.5 on average	Abstained tea, energy drinks, alcohol, consumed tea, cigarettes
15	Right	**Positive=2.1** Neutral=2.5 Negative=2.8	27=happiness +4.5 on average	Abstained all
16	Right	**Positive=1.1** Neutral=2.6 Negative=3.1	26=happiness +3.5 on average	Abstained all
17	Right	**Positive=2.6** Neutral=3 Negative=3.1	27=happiness +4.5 on average	Abstained all
18	Right	**Positive=1.6** Neutral=2.5 Negative=3	25=happiness +2.5 on average	Abstained coffee, energy drinks, alcohol, cigarettes, other consumed tea
19	Right	**Positive=1.9** Neutral=2.5 Negative=3.6	26=happiness + 3.5 on average	Abstained all
20	Right	**Positive=1.9** Neutral=2.2 Negative=3.3	31=happiness +8.5 on average	Abstained all

Table 27: results of the control measures

Having described the results of the control measures for the experiment these were cross referenced with the biofeedback and self report results to check whether these factors affected the results.

The difference between the biofeedback tests of each subject between the pretest and while watching the adverts were compared to the results of each control measure separately to see whether they had an effect on the results. A MANOVA was performed on the handedness scores and the results of the biofeedback tests[41] to see whether this affected the scores. There was some indication that there was an effect but this cannot be considered significant (F=2.901, p=.067; Wilks' Lambda=.6; partial eta squared=.352). Handedness had no significant effect on the EMG results (F=1.412, p=.250) nor the HR results (F=.285, p=.6) but it had a significant effect on the SC results (F=4.613, p=.046).

Next, the UWIST mood scores[42]were compared to the biofeedback results but there was no significant effect (F=.601, p=.727; Wilks' Lambda=.7; partial eta squared=.107). Judged separately, there was no indication that SC (F=.633, p=.543), EMG (F=.674, p=.523) or HR (F=1.004, p=.387) had any significant effect on results.

Using the Eysenck Personality Inventory as a control measure showed no significant effect of personality on results (F=.781, p=.522; Wilks' Lambda=.872; partial eta squared=.128). Taken separately, personality had no significant effect on SC (F=1.323, p=.265), EMG (F=1.159, p=.296) or HR responses (F=.660, p=.427)

The use or abstinence from stimulants also had no significant effect (F=1.144, p=.361; Wilks' Lambda=.8; partial eta squared=.177). It also had no significant effect on the results

[41] This was a single figure created by subtracting the biofeedback responses for the pre-tests from those gained while the adverts were showing.
[42] Categories used were 1 for positive, 2 for Negative and 3 for Neutral

for each biofeedback measure separately: SC (F=.907, p=.354); EMG (F=2.611, p=.124); HR (F=.408, p=.531).

As the control measures were limited, the researcher discussed the content of the adverts with the viewer in case there any other significant factors which affected the emotional responses. One issue was the knowledge of the places, so positive emotional responses increased when the viewer lived near to the city. This could explain the high response rate to Peterborough which is close to the city where the tests took place, Leicester, and discussing the experiments with the subjects showed that some were from the city and others had friends there. Another subject had a high response for Greece and Leeds and on questioning this she explained that, 'I am from Leeds and my boyfriend is from Greece'. The types of stimuli that the viewers responded to also varied and this was discussed afterwards. One subject, for example, who was quite low on all readings (SC, HR and EMG) until a road sign came up in York was unable to explain the response but another, on seeing a building in Sunderland another subject registered a large increase as he used to cycle there as a child.

6.9 Conclusions

The results of the experiments generally indicated that the place adverts attempted to and succeeded in gaining a hedonic effect. However, the connections between the three stimuli – voice, music and face – and the expected emotional response were not significant. While there was a general movement towards a happy response, there were no discernable patterns between the places where the subjects registered the highest degrees of happiness or between the rank order of places according to the biofeedback results. There was also few links found between the attributes of the stimuli and responses.

CHAPTER SEVEN: CONCLUSION

This thesis aimed to test the hypothesis that, 'the presence of three emotional stimuli in adverts - voice, music and face - will cause a corresponding emotional effect in viewers'. This chapter is divided into two sections. (7.1) gives the narrative which led to the testing of the hypothesis with an example. (7.2) examines the results of the test to see whether the hypothesis was correct. While discussing the main outcomes of the case study test, there will be a consideration of why they may have happened. In (7.3) there is a consideration of changes that could be made to the method. (7.4) summarises the study and concludes on the hypothesis.

7.1 The process of the study of emotional effects

This section outlines the process which was followed before the hypothesis could be tested. In order to test the hypothesis, it was necessary to (i) define the subject matter, (ii) explain the purpose of emotional stimuli in adverts (iii) consider how these emotional stimuli might be measured (iv) identify key quantifiable emotional stimuli that can affect the individual and how this may happen and (v) find a way of measuring both the presence of these key stimuli and their effects on the viewer.

i) Definition of subject matter

Dictionary definitions of 'emotion' tend towards synonyms reflecting the abstract nature of the subject. There is no consensus (Nielsen and Kasniak, 2007) on what the phenomena of emotion is. As a result it has been interpreted in many ways: as a bodily reaction (cf., James, (1892); Allport (1925); Hess (1935)); a cognitive response (cf., Schacter and Singer (1962); Dutton and Aron (1972)); learned behaviour (Watson (1929) and

functional tool (cf., Plutchik (1980); Rolls (2005)) among other interpretations. These four interpretations all help, this study has stated, to define the topic; following the approach of Cornelius (1996) to view biological, cognitive, behaviourist and motivational schools as useful contributors to a definition of the subject. Having defined what emotion is, the study centred on a growing consensus in the field of emotional study that it is a biological-cognitive two-component process (cf., Cardland (1977); Oatley and Johnson-Laird (1987)) and, for the purposes of this study this perspective has been adopted arguing that while behaviourist and motivational schools help to explain the regulation and purpose of emotion, they do not explain the physiological-psychological changes emotional stimuli might affect. Emotion, then, is both a physiological response and a cognitive rationalisation which can happen to schematic and situational cues (cf., Thompson, 1988).

In order to test the hypothesis that hedonic stimuli would affect the viewer, this study referred to both the primacy of the biological response and the existence of precognitive triggers. Both factors were crucial to the main hypothesis. The primacy of a biological response is supported by Heidler (1980), LeDoux (1999) and Marci (2006). Critically, neuroscience's study of the patterns of hemodynamic activity show that the pathway of emotional response is to the more primitive protoreptilian parts of the brain first before the more advanced cerebral cortex (cf., Marci, 2006). Furthermore, having established that emotion can be a biological response this study considered whether it was possible for stimuli to affect an individual in a precognitive manner. Experiments by Wilson and Zajonc (1980) and Ohman and Soares (1994) among others have demonstrated that humans can receive stimuli before cognition. Scherer (1987) and Sloboda and Juslin (2001) added to understanding of how specific precognitive stimuli of voice and music respectively, can have such a triggering effect.

ii) Purpose of emotional stimuli in adverts

Chapter Two gave three reasons why emotions are used in advertising: they change attitude, make decisions and determine attention levels. In this chapter it was suggested why there was a need to study the subject as advertisers are increasingly aware of the power of emotion due to technological advancement, notably fMRI. This ability to read the effect of advertisements on individuals has come at a time when mass media texts have proliferated due to the internet and information overload (cf., Commander and Wilson, 1974) and gaining attention is harder than ever. Emotion is seen by some as a major attention-getting device (cf., Mehta and Purvis, 2006). Furthemore, when there is a case of too much information the individual relies on judgement simplifying devices (cf., Andersen (1974); Ajzen (1975) and Clore, 1988) such as emotion to help people to function. The importance of emotions to brands is being seen by advertisers such as Saatchi and Saatchi responding to research on how signs are coded with emotions and that thought and feeling are intertwined. How someone feels about a product may be more important than what the individual knows about it particularly in a world of parity marketing where so many products are manufactured by the same firms under different brand-names. With this interest into emotions and with industry testing of the effects it is a pertinent time to consider how adverts can be tested for their emotional content and effects.

iii) Measurement of emotional stimuli in adverts

Emotions, then are critical to advertising today but there is no agreement how to measure them (Mehta and Purvis, 2006). This study amalgamated existing ways of quantifiably testing audio-visual texts for emotional content and responses in a unique manner thus providing a possible new way of ascertaining both the encoding and decoding processes of emotional advertising and a way of measuring the connection between them. In

Chapter Three, existing ways in which emotion was tested for content and response were examined. Interviews and content analysis were the main methods of discovering what the encoders' intentions were. Interviews with encoders has the usual problem of industry practice being viewed as 'normal' and therefore the techniques are not always apparent and expressible by the practioner (cf., Berlo, 1960). The subject matter of emotion has cultural connotations of irrationality and therefore 'bad' (cf., Newhagen, 2002) along with overtones of propaganda which a practioner may be reluctant to admit to. Emotions are also difficult to understand and express so it makes a difficult topic to try to get the advertiser to explain. Industry secrets may also restrict the results of an interview. All these problems are apparent but it remains the most direct route of finding encoder intentions and so researchers such as Niyalasy and Reid (2009) and Smit et al (2009) have used it. Because of the limited results this may bring, content analysis is a more common method of testing for emotional content (cf., Kolbe and Burnett, 1977) and, it might be argued more valuable. There are drawbacks to this (along with every) method of being time-consuming, coder reliability and a sense that it is a recoding not a decoding (Barthes, 1993) but it is a well-established method.

Chapter Three also considered ways in which the decoding of adverts was measured. Self-report has, like content analysis, a pedigree in industry (cf.,Gunter (2000); DuPlessis (2005)) and social science (cf., Rosenburg (1982); Eden and Chapman-Moore (1991) and Polegato and Bjerke (2006)). This study considered the drawbacks and strengths of self-report and identified five ways of testing subjects for received emotions: interview; mood adjective checklist; semantic differential; self-assessment manikin; affect rating dial and Feeltrace. The latter method, it was argued, overcame some of the problems of measuring emotional response as it was in real-time and so did not suffer from 'duration neglect' (Gray and Watson, 2007). Feeltrace avoids some of the problems of verbal report by using colours and shapes, allowed moment-to-moment recording of feeling recognising the changing nature of emotion. Furthermore, the program was designed by Douglas-Cowie et al (2001) to work

with audio-visual material and came with training files and instructions to ensure standardisation of method.

Chapter Three also considered how biological responses could be measured. These were critical to the study as it had defined emotion as a biological-cognitive response which had the capacity for biological primacy. Furthermore, as established, the individual has the capacity for precognitive appraisal whereby sensory information such as adverts are scanned by preconscious brain system for key stimuli that may be of danger or pleasure to the organism. They trigger Event Related Potentials to the organism who attends to the cause. Not only does the trigger cause attentioning, it also suggests a possible emotional response. Biofeedback measurement tools such as the ProComp Infiniti has the capacity to record such changes as it reads signals to the body at 256 milliseconds. Thus, any ERPs that occur can be measured and so, it should be possible to see whether a stimulus has had a desired response. In this chapter, heart-rate, blood volume, EEG, skin conductance, facial feedback and body fluid analysis were all considered for their strengths and drawbacks as well as studies of adverts using these methods. Often, though, because of the fleeting nature of biofeedback, responses to stimuli were by individual sensory input such as a photo or a single noise. Otherwise, the signal becomes 'muddied' by cognitive processes.

This 'muddying' problem is an issue when studying emotional responses to texts. There are so many factors which can affect them. Chapter Three considered some control measures that should be in place when testing for emotional responses. These control measures include mood, personality, stimulants taken and handedness. The list of possible variables which can affect response is longer than these but they have the benefit of being measurable. In the case of mood, there is the UWIST mood scale which gives an overall score as to whether the individual is in a positive, negative or neutral mood. There are many ways of testing personality traits to discover whether the individual is liable to positive or negative outlook, the Eysenck Personality Questionnaire having the benefit of being

thoroughly tested across cultures and over time with consistent results (cf., Furnham et al, 2008). Stimulants such as alcohol may affect the reading of an advert (cf., Battig, 1984) and Cooper et al, 1988) so the taking of these are measured beforehand along with handedness as the dominant hemisphere can affect how an advert is received. These control measures can act as variables in an experiment on emotions so it is important to consider them ready to assess their significance later.

iv) Three key measurable emotional stimuli

This study, so far has established that emotions are a two-component biological-cognitive phenomena that can be measured by biofeedback and self-report. The stimuli that can affect emotions can also be measured, by interview and content analysis. Therefore, it is possible to test the hypothesis posed at the beginning of the study, 'the presence of three emotional stimuli in adverts – voice, music and face – will cause a corresponding emotional effect in viewers'. There is, though, no established method created to do this in a quantifiable way. There are a series of stages that are in place, such as content analysis and biofeedback response but the system of being able to record the links between encoding and decoding is not there prior to this study. This study links a series of stages of testing emotional content and effects in a quantifiable way. It also focuses on stimuli for which there is strong evidence foe precognitive effect. In Chapter Four, these three key stimuli are investigated. Of course, the three are not an exhaustive list – winning, laughter, words and colour all have strong precognitive properties. Colour is very difficult to define and subject to human interpretation as well as environmental conditions, laughter is likewise difficult to measure and winning and words both call for a degree of cognitive interpretation so making their precognitive nature questionable. It may also be that the individual develops the Stimulus Evaluation Checks to include key stimuli which may be critical to his/her wellbeing. The chosen three stimuli in this study are ones which can be measured empirically. Music, voice and face, however can

be measured and have good critical empirical evidence for their ability to affect an individual in a precognitive manner.

The first stimulus chosen - voice - is thought to be a primitive signal of emotion (cf., Budd, 1985). Prosody, the expression of words has been measured by Scherer (1982), Cahn (2000), Gustafson-Capkova (2001) and Burkhardt and Sendlmeier (2000). Not only have they classified the nature of prosodic expression but they have supported their findings with empirical tests. Key prosodic features of voice from such researchers include pitch level, speed, pitch range, pitch accent and formant quality. The nature of which features are chosen varies between researcher and this study has chosen those which have a wide-element of agreement. The second stimulus is music. Its way of affecting the individual emotionally is thought to be connected to voice, in fact can be termed a 'superexpressive' voice (Juslin and Luakka, 2003). Key features of music are similar then, to voice with pitch, speed, variability but there is also key and note direction which can be used to express emotion (cf., Gabrielson (1995); Julsin and Luakka (2003); Hevner (1937); Booth-Davies (1978) and Rapoport (1996)). A third measurable precognitive stimulus is face. The idea of facial feedback goes back to Allport (1924) and so is connected to a biological view of the subject. Since then, quantifiable evidence has been found by Doherty (1988), Peper and Karcher (2001) and Hess and Blairy (2001) amongst others including fMRI evidence (Morris et al, 1998) that there is an automatic trigger set off by emotionally expressive faces. This trigger not only sets off an Event Related Potential for the organism to feel the same feeling but a mimicry signal (cf., Hatfield, 1994) to express it. This makes face one of the most powerful of precognitive stimuli.

There is an argument that Event Related Potentials are not emotions. Some call the signal for the brain to 'feel' no more than proto-emotion (cf., Sloboda and Juslin, 2001). emotion, itself, being a more substantive and cognitive experience (cf., Ekman, 2007). It is for this reason that along with biological, cognitive responses are also needed. Not only do

they help to confirm or deny the triggers in the adverts, they also show whether the potentials are realised. If an advert were to merely trigger signals that the individual is liable to reject then their significance must be questioned. The hypothesis posed in this study suggests that the precognitive stimuli in the advert are liable to position the viewer towards accepting the emotional direction of the ERP.

v) A new method to test the presence and effect of these three key emotional stimuli

Chapters Five and Six give details of an experimental design to test the hypothesis. Chapter Five outlines the method and Chapter Six realises it. The previous four chapters had created a narrative that emotion is a two-component process, that it can be triggered in a preconscious manner by key stimuli, that three of these stimuli are voice, music and face, and that are ways of measuring not only their presence but their effect. Chapter Five shows how, using a series of stages that had been used previously to measure content or effect, the two parts could be combined to show how one could lead to the other. Rather than dealing with a discrete stimulus as empirical tests often do (cf., Teft (1975) and Pallmeyer (1986)) this study poses a method to measure several stimuli and their effect. Many studies into emotion take small samples or single sounds and test the responses to these as Tarasti explains: 'There exists nowadays strict mathematico-logical systems whose rules are quite explicit (but which) produce rather trivial results. Yet their adherents almost always say: "Naturally, this is still fairly rudimentary, because we are dealing with a new method...but just wait for the method to develop; then you'll see how it can resolve more complicated problems and situations!" Most often such a moment never arrives' (Tarasti, 1994: xiv). This method takes a series of stages and uses them to test a complex audio-visual text for three stimuli and many potential emotional effects.

The method in Chapter Five starts with two ways of measuring emotional content. First there is the interview of the creators of the text. If the advert being tested is a single one

then that is a relatively easy task except for the many influences of market research, client, professional norms, creative intent that the individual who is being interviewed may not want to reveal or may not be aware of (cf., Tunstall (1964); Mayer (1958) and Berlo (1960)). If a series of adverts or genre is being tested then it is more difficult to assess who is responsible for the encoding. A genre of adverts may have a similar emotional intent, such as perfume, charity or public information texts. Therefore, interviewing some of the creators may be able to ascertain the emotional intentions. The interview can play a significant role in determining which emotion the advert should be trying to affect. This information is critical as in the content analysis it is necessary to construct categories of content. To just have units of analysis is too general, content analysis needs the nature of these attributes to be defined before they are looked for otherwise, it can become a, 'fishing expedition' (Holsti, 1969). This study has defined the nature of the attributes of archetypal emotions for voice, music and face from many sources (cf., Burkhardt and Sendlmeier (2000); Nwe et al (1978); Mozziconacci and Hermes (1999); Scherer (1987); Iida (2000); Cahn (1983); Paeschke and Sendlmeier (2000); Juslin and Luakka (2003); Gabrielson (1995); Hevner (1937); Adachi and Trehub (2000); Booth-Davies (1978); Rapoport (1996); Ekman and Friesen (1978 and Dactu and Rothkrantz (2004)). Having assembled the attributes from many studies, a new quantification system was established, by comparison to neutral files. In order to get these for voice, existing speech corpora were used which come labelled with key features for neutral or allow these to be obtained by analysis. For music no such resource exists so a series of random music files were analysed and the mean levels used as a base to compare with advert music.

The method posed by this study needed little coder intervention as it was semi-automatic. Relying on computer analysis for voice prosody reading, music quality and using computer coding software for faces, reduces the issues of inter-coder reliability. This study assembled a series of analysis programs in a unique fashion. Voice was labelled and divided

by Speech Filing System and analysed by PRAAT. Music was coded into midi form by WIDI and analysed by Miditoolbox, an add-on to MATLAB. Faces were coded using Icode and analysed using FACSAID.

Having outlined a method for semi-automatically measuring precognitive stimuli content, Chapter Five then describes a method for analysing the responses. Biofeedback readings vary from person-to-person so it is necessary to first gauge an average reading, done by recording a baseline level before the advert is seen (cf., Rickard, 2004). ProComp Infiniti or another biofeedback recording device can then be attached to the viewer at key places according to the emotional response expected. This is discovered by both the interviews of the encoders and the content analyses. There is also detail of how details of the control measures can be attained. Finally, in Chapter Five, there is detail of the process for using Feeltrace.

Having gained the biofeedback and self-report data, it must be analysed. Feeltrace gives general results for each text and shows the movements of the cursor. This can be shown visually and an average figure for all the movements can be gained to demonstrate the effect of each individual advert. The biofeedback data can be analysed using SPSS. ANOVA, MANOVA and T-tests can ascertain similarities in responses to see if there are links. Because of the different nature of stimuli and biofeedback responses, Spearman's rho analyses can be gathered to discover if there are links between the stimuli and the biofeedback response.

7. 2 A discussion of the results in Chapter Six

This thesis has arisen out of a need to study emotions due to their increasing importance to advertisers but there being no agreed method of how this should be done. Furthermore, there is no available method to study key triggers of emotions which can affect

the individual in a preconscious way. There are studies on each of these triggers separately but there has not been, prior to this study, a way of collating them and using them on an advert or indeed any complex text. This study brings together the data and methodology of those studying precognitive responses to audio-visual texts and applied them to advertising to see whether their findings could be replicated.

In Chapter Six, there were some positive results from the new method posed by this study. The statistics showed a mild response concomitant with the stimuli. There were also correlations between key stimuli and responses. For voice-overs there were significant correlations between the pitch level and F1 formant level of voice and the biofeedback responses. For music, there were significant correlations between major sequences and biofeedback response. For faces there were significant correlations between two adverts (Mauritius and Cyprus) and SC-level. For self-report, there were correlations between emotion felt and key sequences, pitch direction and amount of notes per section.

There are other positive outcomes from this study. It confirms that interviewing encoders of the texts can result in positive outcomes. Six out of the seven interviewees mentioned the same emotion, the importance of feeling 'good' or positive. This emotion was confirmed in the analysis of the voice, music and faces in the adverts. That there was a successful outcome from the interview confirms the methodology of Zaltman (1995) – that going to the creators of the text was the best way of gaining insights into intention. From the words used in the interviews including the archetypal 'happy' along with 'pleasure' and 'feeling good' a key intention of place adverts could be tested for, using an overarching term, hedonic. The hypothesis of the example therefore became: 'the presence of three hedonic stimuli in adverts – voice, music and face – will cause a corresponding emotional effect in viewers'.

The results of the content analysis confirmed the presence of hedonic stimuli overall. The results are summarised in Table 28.

1. Voice	Success rate	2. Music	Success rate	3. Face	Success rate
mean pitch	46%	Note speed	100%	Adverts with hedonic faces	40%
Pitch declination	38%	Note standard deviation	54%		
Pitch range	84%	Note distribution	79%		
Syllable speed	15%	Melodic range	62%		
Stressed words	53%	Key	77%		
Jitter	77%	Rising pitch	23%		
Accent peak	77%				
Length to accent	92%				
Formant pitch	69%				
Overall	69%	Overall	65%	Overall	40%

Table 29: results of the content analysis

Overall, there was evidence of hedonic voice in the advert at 69%. This confirms the findings of researchers into the attributes of voice prosody (cf., Burkhardt and Sendlmeier (2000); Paeschke and Sendlmeier (2000); Mozziconacci and Hermer (1999); Scherer (1987); Cahn (1983), Murray and Arnott (1993)). It is from their results that the attributes of what is hedonic speech were gained. Therefore, the link between the encoded emotion discovered by the interviews and the nature of the texts confirms their findings. In particular, the findings of Cahn (1983) who stated that happy voices have a later accent peak than neutral speech was confirmed with 92% of the sentences following this pattern. Pitch range for happy speech being increased by 100% on neutral was confirmed in 84% of the cases. This is a subject about which there was general agreement cf., (Cahn (1983); Burkhardt and Sendlmeier (2000); Scherer (1987) and Murray and Arnott (1983)) confirmation of which is another outcome of the study. With an increase in jitter rate of 77% of this feature of hedonic speech was confirmed by this study supporting the work of Cahn (1983) and Burkhardt and Sendlmeier (2000). Another key feature of hedonic speech that this study has confirmed is the importance of formant pitch in expressing emotion. This confirms the studies by Scherer and Pittam (1993), Burkhardt and Sendlmeier (2000) and Keinast and Sendlmeier (2000) all of whom stated that happy speech is expressed by an increase in F1 and F2 pitch levels.

Not all speech features were indicative of happiness, though. There is much agreement about the importance of mean pitch level for emotion (Burkhardt and Sendlmeier (2000); Fonagy (1978); Van Bezooijen (1984); Mozziconacci and Hermes (1999); Scherer (1987); Iida et al (2000); Cahn (1983) and Murray and Arnott (1993)). This study found that in only 46% of the words used in the adverts was there an increase in the mean pitch. Pitch declination rates were also not found to be in line with the work of Paeschke and Sendlmeier (2000) as only 46% of the voice-over sentences were not substantially higher at the beginning and end than neutral. There was a 15% success rate for the speech speed, an indicator of hedonic speech for Cahn (1983), Scherer (1987), Moziconnaci and Hermes (2000) and Murray and Arnott (1993) so one outcome of this study is to refute their findings.

There was also evidence music in the adverts were indicative of hedonic expression. In particular an increased note speed from neutral was found in 100% of the adverts confirming the studies of Juslina and Luakka (2003), Gabrielsson (1995), Hevner (1937), Gabrielson and Lindstrom (2001) and Adachi and Trehub (2000). Another key attribute of happy music is consecutive notes being in the first half of the octave. These short note distributions were found in 79% of the adverts confirming the studies of Juslin and Luakka (2003). 77% of the adverts were in a major key confirming the studies of Booth-Davies (1978), Cook (1954), Gabrielsson and Lindstrom (2001) and Hevner (1937). The higher melodic range than neutral was seen in 62% of the adverts giving some evidence for the studies of Juslin and Luakka (2003), Gabrielsson and Lindstrom (2001) and Hevner (1937). Less convincing results were found for rising pitch which occurred in only 23% of the movements between notes (most often, the same note was repeated) so this does not confirm the studies of Juslin and Luakka (2003), Gabrielsson and Lindstrom (2001) and Rapoport (1996).

Happy faces were evident in just 40% of the adverts. This key hedonic indicator was not used in most of the adverts. It was notable that those that did use them were all international adverts with 73% of these adverts using this expression of happiness.

The self-report responses were conclusive, overall, as the mean figure for all viewers was vertical =.4899; horizontal =+.2861. Any mean figure which had both positive integers means that overall, the cursor was in the top right segment of the circle where hedonic words and colours were positioned. 93% of the mean responses to the adverts were in a positive position with 37 mean readings out of 40 resulting in responses indicative of a hedonic effect. Moreover the mean figure of both vertical and horizontal cursor position was over the word 'happy'.

The results of the biofeedback testing also showed that generally there was a hedonic response to the adverts. Taking each biofeedback indicator separately, in 80% of the cases, the SC reading of the audience decreased while watching the advert, in line with hedonic effect confirming the studies of Rickard (2004) and Vastfjall et al (2002). Likewise, for EMG, positioned on the zygomatic region to record a happy afferent feedback, there was a 60% increase of overall activity compared to the baseline figure which confirmed the biofeedback studies of responses to emotional stimuli by Hess and Blairy (2001), Peper and Karcher (2001), Marci (2006) and Hazlett and Hazlett (1999). The same figure of a 60% increase overall in HR response confirming the research by Bradley and Lang (2007) and Poels and Dewitte (2006). Those who responded to all three measures together which is a true reading of hedonic response were only 35% but 70% had two or more reading indicating hedonic effect. If the effects of the adverts were to be consistent, there should have been some agreement between the ranking of the responses ie the advert which made HR rise the most should have been correlated with the one that made EMG rise the most. This was not the case, with a Spearman's rho result of (rho=-.275, N=20, p=.240, two-tailed) the result showed no significant correlation.

As with the content analysis, then, the biofeedback results were generally indicative of the hedonic but there was no conclusive response, perhaps reflecting the mild nature of the hedonic content in the adverts. Despite the general nature of the results being in line with the hypothesis, the results were not conclusive. There were no significant correlations between the attributes for all three stimuli separately and the responses and all three together. The possible links were tested on a time-basis, linking the moment the attributes were available to the viewer and their corresponding response. This brought no significant correlation. The amount of stimuli in the adverts were compared to the level of biofeedback and self-report responses but, again, there was no significant correlation. If there had been clear links between the stimuli and the responses, then the advert should be able to be ranked according to the amount of content and when compared to the rankings of the adverts which gained the highest hedonic readings, a link found. Taken together, the rankings of the adverts which content, biofeedback and self-report data shows are the most hedonic, there are no links. A Spearman's rho analysis of the ranked results gave a null hypothesis response (rho=0.137, N=20, p=.563, two-tailed). Furthemore, when bracketed into groups of dependent and independent variables, a MANOVA also revealed a null hypothesis (F=.428, p=.787; Wilks' Lamda = .9). This null hypothesis for most of the stimuli and responses questions the validity of the method as it is so the next section will discuss some reasons for this and possible modifications of it.

The tests to see whether the individual attributes could account for emotional responses brought some key findings, summarised in Table 29. Considering the amount of attributes tested for, this is a limited result and it must be taken into account that, while the data brought significant results, there is not enough evidence here to establish a definite correlation. All attributes were tested for biofeedback together, biofeedback separately and self-report. To be convincing, a pattern should have emerged of these key attributes resulting

in changes to emotion. This was not the case. The study presents these findings as areas for further research but cannot conclude on a proven link between them and response.

Attribute	Correlated response	Correlation level between attribute and response
F1 formant level of voice	HR, SC, EMG	.012
F1 formant level	HR	.042
Major sequences of music	HR, SC, EMG	.008
Musical key	Self-report	0.05
Note changes 1-4	Self-report	.042
Number of notes per second	Self-report	.005

Table 29: positive outcomes from tests of attribute qualities and responses

7.3. Recommendations for modification of the method

It was clear from the example that it needs modification. The limited amount of useful data produced from the interviews confirmed the views of Berlo (1960) that interviewing encoders of texts can result in limited findings. In particular, as Newhagen (2002) and Oatley and Jenkins (1996), the subject of emotions was one which there was a reluctance to discuss. It may have been that, as Budd et al (1985) believed, the verbal expression of emotion is 'useless' as affect and cognition are not well-linked. Other reasons for a reluctance to impart emotional intentions may have been a suspicion of the subject, as predicted by Dilard and Pfau (2002). The reluctance to reveal emotional intentions can also be explained by Halloran's (1996) comments on the suspicion the industry has of media research. As this was a study attempting to find a subject that might not only be part of the 'lower mind' (Newhagen (2002)) but also may be connected to propaganda – an accusation of which would inevitably cause a reluctance to be open about.

A strength of the method chosen was the choice of many influences on an advertising campaign as opposed to just the creative team as adverts are created collaboratively (Halloran, 1996). However, the interviewees were only linked to one of the adverts and so

could not express the intentions of others. Also, the media professionals who created the texts may not have known the content-aims of the text. This could be because being a collaborative piece the content could well have been defined elsewhere. The method made a presumption that the intentions of those creating a type of media text, in this case a place advert, would be the same. A solution to this problem would be to interview the encoders of adverts rather than a genre. It may be just as effective, given the reluctance to admit to intentions, or even know them, to use questionnaires with closed responses. This would be easier to express, allow the advertiser to feel that encoding emotion in adverts is expected and therefore not culturally unacceptable and it would also overcome the problems of interviews being hard to arrange, costly and time consuming (cf., Gilham (2000)).

That the results of the content analysis did not produce more convincing evidence of hedonic voices could be the result of several factors. While there were similarities with many of the adverts, some had different audiences and agendas. Out of the top ten adverts for the amount of hedonic content (for example, York was aimed at the business market) for the three stimuli, only one (Birmingham) was from the UK and gained via tourist board. To have selected adverts based on likely outcome would have not been in the spirit of empirical research, however, equally to select texts which have differing aims is to analyse a varied body of communication. The encoders of some texts would not have had the same intention as the encoders of others. This leads for a possible solution to the method: rather than try to analyse a genre of adverts to select specific adverts for study. This way, the intention can be clear and therefore, the content should follow more closely.

It is possible that the method could be modified to an expected level of emotional response based on the results of the content analysis. As the content analysis had shown the presence of hedonic stimuli the method could proceed with the expectation of mild hedonic response. It could also be that the method can not continue if the content is not conclusive. Another approach is to agree a level of emotional response according to that identified in the

adverts. For example, if the content of the adverts had over 70% of the features of hedonic expression, then a strong effect could be expected. If the content had above 50% a mild effect could be expected and so on. By adapting the method in this way, it may produce more convincing results.

The lack of significantly conclusive results to the example leads to a possible weakness in the method. When dealing with places or any subject it would be wise to find out attitudes towards it in advance. This was not done as a control measure. The subjects were given time to discuss their responses after the experiment and two were from Peterborough, two had visited the city and, living in Leicester many more would have links to it. This could explain why it got the highest biofeedback response even though it was 15th in the list of hedonic properties and 13th in the list of self-report responses. Place involvement was not factored into the experiment and one of the outcomes of it would be in a pilot test of any advert to discover what types of relationship an audience may have with the product-service being sold and the content matter. There were notable patterns to responses that could be observed and the participant questioned about afterwards. For example, one participant who used to visit one of the sites as a child, another who had a boyfriend form a place and another who was from one of the places. It is possible that these contacts could make the advert non-applicable to the experiment for that participant or that extensive piloting allow for these stimuli to be factored into the result. For example, links to the place being high would have results in a 50% reduction in the response rate – presuming that a 50% increase in response rate was typical for those with close links to a place.

It is also possible that this study reveals what qualitative researchers into emotion would concur with: that individuals are so different that trying to find empirical data with such a complex and personal issue is doomed to failure. The research overcomes many of the problems of traditional effects studies by looking for content that has precognitive qualities. Nonetheless, emotion is two-component and ERPs only suggest emotional responses. They

can be over-ridden. Cognitive responses can be much stronger than ERPs which give fleeting biological signals and so are, in comparison to known emotions, weak. It may be for this reason why precognitive responses are counted by testing for individual stimuli over very small time-frames. Another positive outcome from this study has been to show the great variability of biofeedback response of viewers to adverts. It has demonstrated that key stimuli in the texts are, to an extent, what the individual finds emotionally affecting according to her/his life experience.

While the generally positive results above suggests that it is possible to find a positive outcome with this experimental design, the results are not significant. Most tests to find links between the stimuli and the responses using correlation analyses resulted in a null hypothesis. The significant correlations that did occur may be something out of this study. It may be worth taking just one indicator of emotion – formant levels at F1, for example, and seeing whether these are critical to emotional response. For music, major key sequences and number of notes per sequence can be re-tested. For faces, which have strong evidence of feedback the results were not significant with the exception of two place adverts – Cyprus (t=.3.360, df=19, p=.003) and Mauritius (t=2.440, df=19, p=.024) for HR only. Perhaps there is space to re-test these adverts with new subjects to see whether the same results are comparative. It also gives some indication that facial feedback was happening, at least occasionally.

The self-report responses were conclusive, overall, as the mean figure for all viewers was vertical =.4899; horizontal =+.2861 but the outcome of any such emotional testing can be questioned (cf., Plutchik, 1994). Firstly, due to ethical reasons, the subjects knew the title of the thesis and so may have been willing to please the experimenter by placing the cursor in the area which was likely to give positive results. Secondly, there is the issue of motivation to complete the task properly and it could have been the case that it was easier to leave the cursor in one position rather than continuously move it. The lack of precision of Feeltrace in terms of its real-time recording can be questioned. Often the cursor remained on one point

which is not in line with thinking of emotion as continuously changing and another method that ensures a moment-by-moment changing method of recording emotion may be a better system.

7.4. Summary

This study attempted to discover whether the presence of three key stimuli in an advert – voice, music and face – would affect emotion. This was tested with an example of place adverts and the results showed some connection but no significant correlation between stimuli and results. Therefore, the hypothesis, 'the presence of three emotional stimuli in adverts - voice, music and face - will cause a corresponding emotional effect in viewers' must be considered null.

This study also presented a new way of testing adverts in a quantifiable manner for both emotional content and effects. Despite the null hypothesis of most of the correlation results, the experiment showed some strengths of the method if it is altered. Firstly, the interviews could be changed to a simpler closed exercise. It is also possible that the exact nature of the emotions may be less prescribed beforehand. It is possibly to categorise an advert according to key emotional attributes and from the direction of these attributes determine the likely encoded emotion. This would mean analysing the advert using several coding schedules according to the archetypal emotions. The coding schedule which reveals the most positive outcomes is the emotion to test for. For Feeltrace, an insistence on continuous movement would help with comparison figures for the biofeedback and a second-by-second correlation could be found. Perhaps the program could be adapted and an easier system of moving the cursor which encourages continuous real-time movement. There also should be some more control measures in place, particularly of the connections the individual has with the product-service being advertised. Perhaps the process should only be used with

to one advert, with interviews of those directly connected to the advert providing the hypothesis for the content analysis. If the hypothesis is proven to be correct the tests on the respondents can continue. If it is not, then there needs to be an assessment of the advert's emotional qualities and the individual's biofeedback and self-report tests for all archetypal emotions and discover if there are links between the emotional quality of the text and types of response.

APPENDICES

Appendix One

Neutral speech files analysis

Reference See Appendix Twenty-Three	Criteria	*Neutral female 1*	*Neutral female 2*	*Neutral female 3*	*Average neutral female*
xii	Sentence pitch mean	*187.42*	*195.62*	*217.70*	*200*
vii	Mean pitch syllable beginning to end	*193-141 -52*	*212-140 -72*	*274-182 = -92*	*72*
iii	pitch range	*85-248 163*	*131-242 111*	*296-89 207*	*160*
xiii;iv	mean time of syllable seconds	*0.19*	*0.17*	0.25	*0.20*
v	Stressed words			*2/8 = 25%*	*25%*
vi	Jitter(irregularity)	4%	*na*	*15%*	*9%*
i	Sentence accent peak	*248*	*242*	*296.61*	*262*
viii	Length from beginning to peak	*0.272 of 1.764 =15%*	*0.291 of 1.544 = 18%*	*0.22 of 3.14= 7%*	*13%*
xiv	Vowel formant average F1	*na*	*Na*	*409.16*	*409*
xiv	Vowel formant average F2	*na*	*Na*	*1516.03*	*1516*
xv	Specific vowel formant levels	*na*	*Na*	*AF1406.38 AF2985.74 EF1464.96 EF21952.60 IF1447.83 IF21542.43 OF1700.07 0F2142.37 UF317.39 UF2181.62*	*1406 2985 1464 1852 1477 1542 1700 2142 317 2181*

Reference See Appendix Twenty-Three	Criteria	*Neutral male 1*	*Neutral male 2*	*Neutral male 3*	*Average Neutral Male*
xii	Sentence pitch mean	*103.76*	*117.0008*	*112.785*	*111.18*
vii	Mean pitch syllable beginning to end	*137-98 -39*	*102-103 -1*	*121-97 -24*	*54.33*
iii	pitch range	*83-154=71*	*84-168=84*	*88-166=78*	*77.66*
xiii;iv	mean time of syllable seconds	*0.18*	*0.15*	*0.18*	*0.17*
v	Stressed words	*42%*	*42%*	*50%*	*134*
vi	Jitter(irregularity)	*6%*	*11%*	*13%*	*10*
i	Sentence accent peak	*154.30*	*168.68*	*166.03*	*162.90*
viii	Length from beginning to peak	*0.475 of 1.88=25%*	*0.383 of 1.496=25%*	*0.794 of 1.179 = 67%*	*39%*
xiv	Vowel formant average F1	*750*	*na*	*360*	*555*
xiv	Vowel formant average F2	*1924*	*na*	*1413*	*1668*
xv	Specific vowel formant levels	*AF1 655 A F2 1511 E F1735 EF22133 IF1 1034.28 IF2 2603.89 OF1540 OF22393 UF1*	*NA*	*A NA ENA IF1296 IF21656 OF1215 0F21167 UF1548.6 UF21648.24*	*AF1655 AF21511 EF11735 EF22133 IF1665 IF22129 0F1377 OF21760 UF11548 UF21648*

Appendix Two

Details of the analysis of the Random music files

List of music files used as a random selection and the results.
30 second extracts were taken from each of the following songs. These were turned into MIDI files and put through the same process as the adverts via MATLAB's Miditoolbox
Taken from Apple's iTunes 29/8/05

Artist	Genre
4th St	Hip hop/rap
Alcyone	electronic
Shostakovich	classical
Alice Cooper	rock
American Princes	rock
Andrei Garila	classical
Ashley Jade	dance
Astonvilla	rock
Pussycat	folk
S/T	rock
Badfinger	rock
Beat Farmers	rock
Bill Rickini	alternative
Blackfool	rock
Bloc Party	rock
Dvorak	classical
Brian Johnstown	alternative
Brooke Valentine	pop
Bucho	r&b/soul
Chad Vangaalen	electronic
Cody Chesnutt	r&b/soul
Colin Rivas	rock
Daisuro	electronic
Danno	pop
David Crowderstand	pop
David Gielan	rock
Diesterne	rock
Doug Boy	hip hop/rock
Electric Prunes	rock
Evin	r&b/soul

This was re-tested on 5/7/07 in order to verify the methods These are the first 30 files on Apple's iTunes under their New Releases banner on this date and the resulting analysis. 30 seconds from each song were analysed using MATLAB's Miditoolbox

Artist	**Genre**
Brakes	Alternative
Dragonette	Alternative
Ben Kweller	Alternative
Songs of Green Pheasant	Alternative
Three	Rock
A Farewell Rescue	Alternative
Aaron Ross	Alternative
Absolute Smash Hits	Religious
Adam Joseph	Dance
All Time Low	Alternative
Amanda Reilly	Pop
Amy MacDonald	Rock
Anti Atlas	Pop

ATB	Dance
Architecture In Helsinki	Alternative
BarlowGirl	Religious
BBC Symphony Orchestra	Classical
Belisha	Pop
Beyoncé	R&B/Soul
Bishop Allen	Rock
The Blockheads	Rock
Bow Mods	Alternative
New Kidz	Reggae
Camp Lo featuring Jungle Brown	Hip-Hop/Rap
Chris Norman	Pop
Corey Harris	Reggae
David Cronenberg's Wife	Alternative
Crazy Penis	Dance
Diamond Head	Rock
Dino Moran with Milk & Sugar	Dance
Edgar Jones & The Joneses	Rock
Elana James	Country
Elvis Presley	Rock
Emilie Autumn	Electronic
Erfan	Hip-Hop/Rap
Frank Black	Alternative
Giannis Ploutarhos	World
Hoku	Pop
The Hit Crew	Children's Music
Ill Bill	Hip-Hop/Rap
Igloo FM	Electronic
Johnny Cash	Country
Kaddisfly	Rock
Keith Jarrett	Classical
Kim Wilde featuring Ill Inspecta	Pop
Laurie Anderson	Prog-Rock
Lloyd Cole	Pop
Lloyd Cole and the Commotions	Pop
Michael Bross	Soundtrack

The collated results of the analysis of these random files are below

	All files
speed of note seconds	0.7154
standard deviation short/long notes	0.4312
Note distributions 1 to 4	56%
melodic range semitones	57
major key	
Rising pitch in %	43.47441

Appendix Three

Edinburgh Handedness Inventory Questionnaire

Instructions
For each of the ten activities below, please tell us by circling the correct answers:

- Which hand do you prefer for that activity?
- Do you ever use the other hand for the activity?

Which hand do you prefer when:

Writing		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Drawing		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Throwing		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Using Scissors		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Using a Toothbrush		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Using a Knife (without fork)		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Using a Spoon		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Using a Broom (upper hand)		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Striking a Match		Left	Right	
Do you ever use the other hand?	No preference		Yes	No
Opening a Box (lid)		Left	Right	
Do you ever use the other hand?	No preference		Yes	No

Thank you for your responses!

Appendix Four

EYSENCK PERSONALITY QUESTIONNAIRE

		Please Circle
1	Do you seem to have more than your share of bad luck?	YES NO
2	Do you often feel depressed when you wake up in the morning?	YES NO
3	In general would you say you are satisfied with your life?	YES NO
4	Do you find a good deal of happiness in life?	YES NO
5	Do you sometimes feel you don't care what happens to you?	YES NO
6	Do you generally feel in good spirits?	YES NO
7	Do you ever feel 'just miserable' for no good reason?	YES NO
8	Do you see your future are looking quite bright?	YES NO
9	Have you ever wished you were dead?	YES NO
10	Do you often feel down in the dumps?	YES NO
11	Do things often seem hopeless to you?	YES NO
12	Do you smile and laugh as much as most people?	YES NO
13	Have you often felt listless and tired for no good reason?	YES NO
14	Are you often bothered by noise?	YES NO
15	Do you feel you often get a raw deal out of life?	YES NO
16	Do you think that people really don't care what happens to you?	YES NO
17	Do you often suffer from loneliness?	YES NO
18	Do you think you are contributing to the world and live a useful life?	YES NO

19 Is there at least one person in the world who really loves you?
YES NO

20 Would you agree it is hardly fair to bring a child into the world the way things look now?
YES NO

21 Generally speaking have you been successful in achieving your aims and goals in life?
YES NO

22 Are you often overcome by sadness?
YES NO

23 Does it seem to you that it is always other people who get the breaks?
YES NO

24 Is it a long time since you last felt on top of the world?
YES NO

25 Do you feel cheated when you look back on what has happened to you?
YES NO

26 Are you about as happy as the next person?
YES NO

27 Do you ever get the feeling you are just not a part of things?
YES NO

28 Is your sleep usually fitful and disturbed?
YES NO

29 Do you often feel lonely when you are with other people?
YES NO

30 Do you feel a sense of inner calm and contentment most of the time?
YES NO

THANKYOU!

Adapted from: Eysenck, Hans and Wilson G (1975) Know Your Own Personality, Temple Smith

Appendix Five

UWIST MOOD QUESTIONNAIRE

Here is a list of words which describe people's moods or feelings. Please indicate how well each word describes how you feel AT THE MOMENT.

For each word, circle the answer from 1 to 4 which best describes your mood.

	Definitely	**Slightly**	**Slightly Not**	**Definitely Not**
1. Happy	1	2	3	4
2. Dissatisfied	1	2	3	4
3. Energetic	1	2	3	4
4. Relaxed	1	2	3	4
5. Alert	1	2	3	4
6. Nervous	1	2	3	4
7. Passive	1	2	3	4
8. Cheerful	1	2	3	4
9. Tense	1	2	3	4
10. Jittery	1	2	3	4
11. Sluggish	1	2	3	4
12. Sorry	1	2	3	4
13. Composed	1	2	3	4
14. Depressed	1	2	3	4
15. Restful	1	2	3	4
16. Vigorous	1	2	3	4
17. Anxious	1	2	3	4
18. Satisfied	1	2	3	4
19. Unenterprising	1	2	3	4
20. Sad	1	2	3	4
21. Calm	1	2	3	4
22. Active	1	2	3	4
23. Contented	1	2	3	4
24. Tired	1	2	3	4
25. Impatient	1	2	3	4
26. Annoyed	1	2	3	4

Appendix Six

STIMULANTS DETAILS

In confirm that in the previous 24 hours I have abstained from consuming the following stimulants (please circle as appropriate):

	Abstained	Consumed
Coffee	√	X
Tea	√	X
Energy drinks	√	X
Cigarettes	√	X
Alcohol	√	X

Any other stimulants taken:

Appendix Seven

Interview Schedule

What do you think the image of Coventry is like to non-residents?

When you approach different markets, is there a difference in the way you produce promotional literature?

What perceptions of the city would you like to alter?

What are the main barriers to altering these perceptions?

Which organisations do you think are responsible for advertising the city?

Are there any comparisons with the advertising or marketing done for other cities that you think could be copied?

How important is the media in creating an impression of a place?

How important is advertising to people's opinions of a place?

Is it possible to change people's opinions of a place?

What do you think the strengths of the current marketing campaign are?

What is the brief behind the current campaign?

Are there any specific requirements of colour, logo, images that you must include in the advertising?

How important do you think emotions are in the way people think about places?

What emotional responses would you like people to have of Coventry?

Are there any methods use in your advertising or marketing that try to appeal to emotions?

Are there any methods you think should be used?

Appendix Eight

List of cities contacted and response. Bold signifies the audio-visual was used

Bath – commercial historical video only
Brighton – video received, music/visual
Birmingham – DVD received, voice/music/visual
Bradford – no video
Bristol – CD-rom received, music/visual but in Flash format that could not be analysed
Cambridge – no response
Canterbury – cd rom received, stills only
Carlisle – commercial historical video only
Chester – commercial historical video only
Chichester – no video
Coventry – video received, voice/music/visual
Derby – video received, music/visual
Durham – no video
Ely – no response
Exeter – no video
Gloucester – county video only
Hereford – county video only
Hull – no video
Lancaster – county video only
Leeds – video received, music/visual
Leicester – no response
Lichfield – no response
Lincoln – commercial historical video only
Liverpool – CD-rom received, music/visual but in Flash format that could not be analysed
London – not contacted
Manchester – no response
Newcastle-upon-Tyne – no response
Norwich – no video
Nottingham – CD-rom received, music/visual but in Flash format that could not be analysed
Oxford – no video
Peterborough – cd rom received, voice/music/visual
Plymouth – no response
Preston – no response
Ripon – no video
Salisbury – video received – music/visual
Sheffield –no video
Southampton – no video
St Albans - historical video only
Stoke-on-Trent – county video only
Sunderland – video received – voice/music/visual
Truro – no video
Wells –no video
Winchester historical video only
Wolverhampton –no response
Worcester – no response
York – video received – voice/visual

List of Internet Sample Audio Visual Texts

All 2005 tourist audio-visuals available from Creative Club via Athens.ac.uk. Bold signifies text used

1.	**Greece**	
2.	**Croatia**	
3.	**Malaysia**	
4.	Malaysia	repeated advert with slight changes
5.	**Cyprus**	
6.	Cyprus	repeated advert with slight changes
7.	Cyprus	repeated advert with slight changes
8.	Cyprus	repeated advert with slight changes
9.	**Bulgaria**	
10.	Bulgaria	repeated advert with slight changes
11.	Greece	repeated advert with slight changes
12.	Greece	repeated advert with slight changes
13.	**Jersey**	
14.	Jersey	repeated advert with slight change
15.	**Isle of Man**	
16.	**Andalucía**	
17.	Andalucía	repeated advert with slight change
18.	Croatia	repeated advert with slight changes
19.	Croatia	repeated advert with slight changes
20.	Croatia	repeated advert with slight changes
21.	Croatia	repeated advert with slight changes
22.	Croatia	repeated advert with slight changes
23.	Cyprus	repeated advert with slight changes
24.	Cyprus	repeated advert with slight changes
25.	Cyprus	repeated advert with slight changes
26.	Cyprus	repeated advert with slight changes
27.	**Mauritius**	
28.	Greece	repeated advert with slight changes
29.	**Spain**	
30.	**New Zealand**	

Completed Audio-Visual is approx 30 seconds of - Andalucía, Birmingham, Brighton, Bulgaria, Coventry, Croatia, Cyprus, Derby, Greece, Isle of Man, Jersey, Leeds, Malaysia, Mauritius, New Zealand, Peterborough, Salisbury, Spain, Sunderland, York

Appendix Ten

Letter sent to participants

118 Oldfield Rd
Chapelfields
Coventry
CV5 8FR

10th October 2006

Dear

I am very pleased that you are taking the time to participate in my research project 'AFFECTIVE TOURISM MARKETING: How and Why Place Marketing Companies Attempt to Elicit Hedonic Emotions Using Audio-Visual Stimuli'. I would like to take this opportunity to tell you more about the nature of the project and also like to inform you about how the data you supply to us will be used and the protections of your privacy and confidentiality that are in place.

Why is this research important?
The results of these experiments will help researchers better understand the methods of emotional persuasion in advertising. It is part of a six-year PhD study into the topic that should be completed this year.

You were selected as the experiment needs someone who is trusting of the experimenter and because of practicalities of availability and transport. The experiment taking place at Leicester University obviously suits a current student. This experiment is nothing to do with your course and completing it or otherwise will in no way affect your grade or progress.

What is involved?
The experiment will last no more than an hour and you will be paid £10 as compensation for your time and any travel costs incurred due to your participation. You will be asked to refrain from excessive alcohol, caffeine and nicotine consumption in the 24 hours preceding as they can affect your responses.

There will be three forms (attached) that you will be asked to complete before the experiment. These forms are designed to measure various aspects of your mood and general personal outlook that may affect your response to the images shown to you during the experiment. They form important control measures to ensure your responses to the experiment are measured as accurately as possible.

The forms include the:

1. The Eysenck Personality Inventory. This assesses general emotional responsiveness.
2. The Edinburgh Handedness Inventory. This is used to see which side of the brain (left/right) is most dominant. This information is useful as the experiment involves placing sensors on one side of your face. A weaker or stronger signal may be the result of placement of the sensor on the left or right side of the face.
3. The UWIST mood chart. This measures your mood directly before the experiment.

The experiment itself will consist of two parts.

1. **The first part involves you looking at some still and moving images on a screen. An Electromyograph (EMG) sensor will be attached to you face and hands. This consists of a pad that is attached to the skin on the face (using light adhesive that is easily washed off) and that can read very slight muscle changes. There are 2 further pads that are attached to the fingers using velcro straps. The sensors are attached to a decoder of these signals which in turn sends them to a computer. The system is very safe and runs on 4 AA batteries so the voltage of the sensors is extremely low.**
2. **The second part will involve you looking at some moving images and your moving a mouse around to different parts of the screen. Your responses will be recorded through FEELTRACE software. This program is designed to register your changing emotions as you watch a series of adverts by moving a mouse over the screen towards key words and has been used in a number of academic studies.**

Protecting your privacy
It is important to stress that your participation in the experiment is entirely voluntary and if at any point you are uncomfortable with any of the procedures involved you are free to withdraw. All information you provide is entirely confidential and will not be disclosed to any third party. Before the experiment you will be assigned a code number and this will be used to store and analyse your data. One hard copy of code numbers and names will be securely stored in the Department of Media and Communication office and destroyed after twelve months. Any writing up of the results of the study will be anonymized and no individual responses will be identified.

If these conditions are acceptable to you and you would like to take part in the experiments then please sign the consent form attached. If you are uncertain or uncomfortable about any aspect of your participation please contact me on jsk10@le.ac.uk or by post at the above address to discuss your concerns or request clarification on any aspect of the study. If you have any questions about the ethical conduct of the survey please contact Rachel Gibson, Department of Media and Communication Ethics Officer on 0118 2523867 or by post at: Department of Media and Communication, University of Leicester, University Road, Leicester LE1 7RH.
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With best wishes,

John Keenan

CONSENT FORM

I …….. consent to taking part in a one hour research experiment by John Keenan (Media and Communications, PhD student) at the University of Leicester. This includes completion of:
a. The Edinburgh Handedness Questionnaire
b. The UWIST Mood Scale
c. The Eysenck Personality Survey
d. A physiological response test to advertising images using the EMG (electromyograph) method
e. A computer-based test to advertising images using FEELTRACE software

I understand the purposes of the experiment and that I can withdraw from the experiment at any time.

I understand that the information collected during the experiment may be used by the researcher, in anonymised form, in published and unpublished research, and I consent to this confidentialised use of my responses.

Signed……..

Appendix Eleven

FEEDBACK FORM

PLEASE ANSWER 1-5
1- STRONGLY AGREE
2- AGREE
3- NEUTRAL
4- DISAGREE
5- STRONGLY DISAGREE

	PLEASE CIRCLE
OVERALL, I AM HAPPY WITH HOW THE EXPERIMENT WAS CONDUCTED	1 2 3 4 5
THE RESEARCHER CLEARLY EXPLAINED THE EXPERIMENTAL PROCEDURES	1 2 3 4 5
I FELT COMFORTABLE DURING THE EXPERIMENT	1 2 3 4 5
THE EXPERIMENTAL PROCEDURES CORRESPONDED TO THOSE DESCRIBED BY THE RESEARCHER IN ADVANCE	1 2 3 4 5
THE RESEARCHER CLEARLY EXPLAINED HOW THE DATA I PROVIDED WILL BE USED IN FUTURE WORK	1 2 3 4 5
THE RESEARCHER CLEARLY EXPLAINED HOW THE CONFIDENTIALITY OF THE DATA I PROVIDED WILL BE ENSURED	1 2 3 4 5
I AM HAPPY WITH THE PROCEDURES THE RESEARCHER HAS PUT IN PLACE TO PROTECT MY CONFIDENTIALITY	1 2 3 4 5

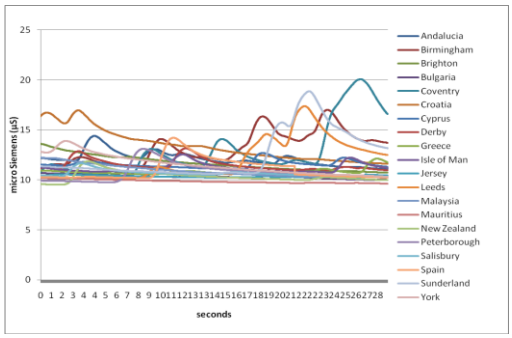
PLEASE ADD ANY OTHER COMMENTS OR CONCERNS YOU HAVE REGARDING YOUR PARTICIPATION IN THE EXPERIMENT BELOW.

YOU MAY CHOOSE TO PUT YOUR NAME TO THIS FORM _____

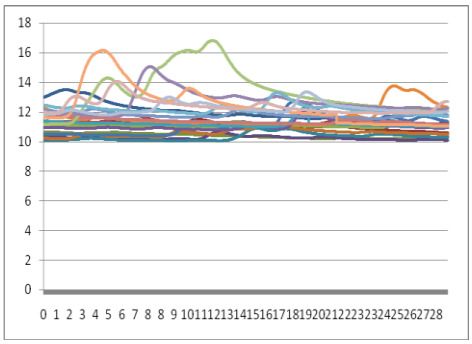
YOU MAY ALSO CONTACT RACHEL GIBSON ABOUT THIS EXPERIMENT. HER CONTACT DETAILS ARE ON THE ORIGINAL LETTER
ONCE AGAIN, THANKYOU!

Appendix Twelve

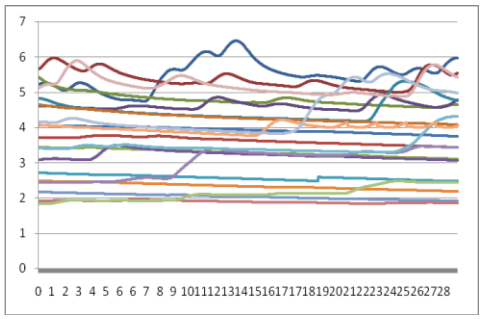
SC Responses



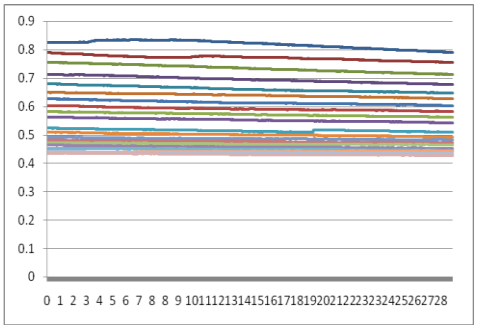
Subject 1 SC responses



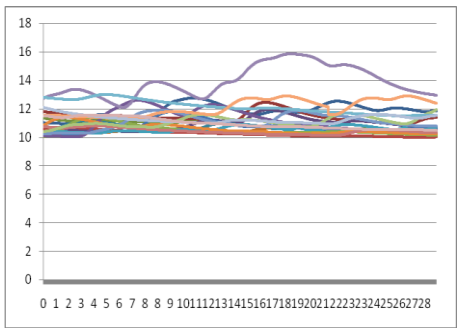
Subject 5 SC responses



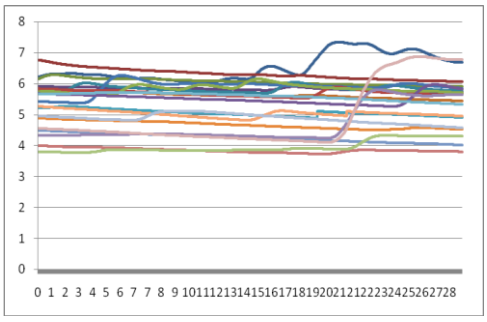
Subject 2 SC responses



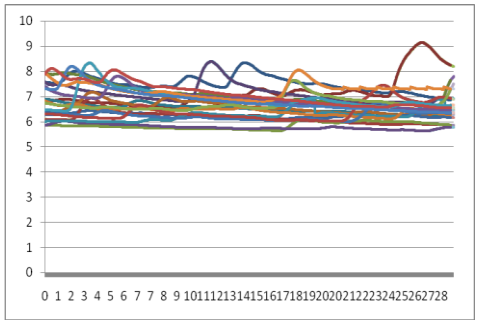
Subject 6 SC responses



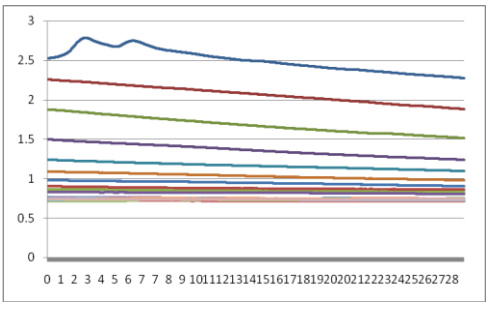
Subject 3 SC responses



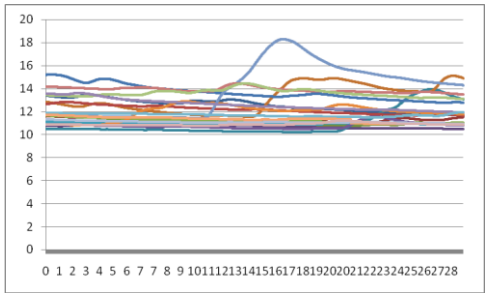
Subject 7 SC responses



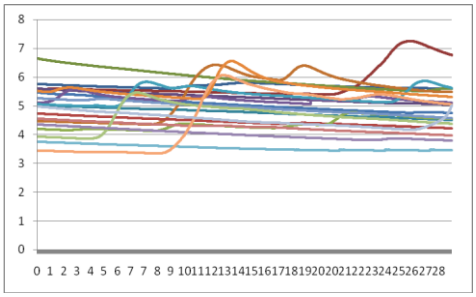
Subject 4 SC responses



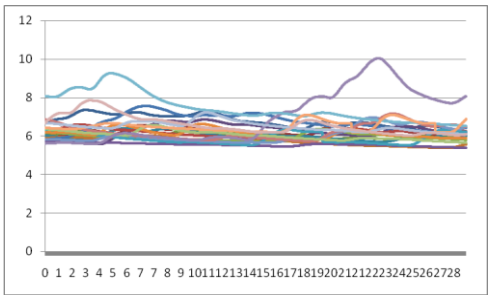
Subject 8 SC responses



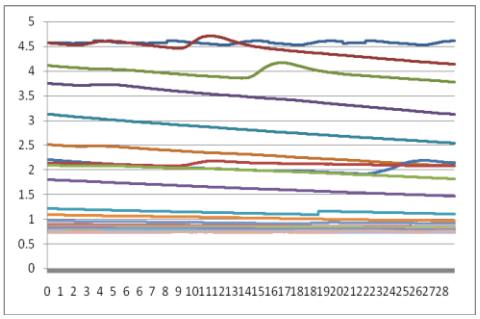
Subject 9 SC responses



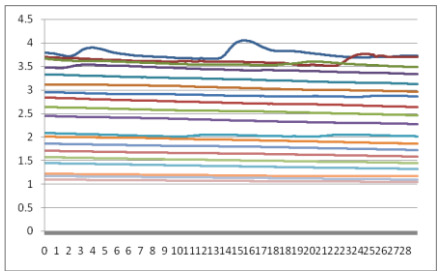
Subject 13 SC responses



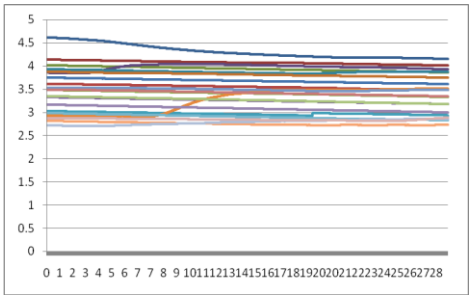
Subject 10 SC responses



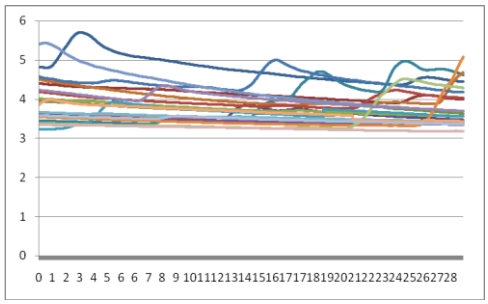
Subject 14 SC responses



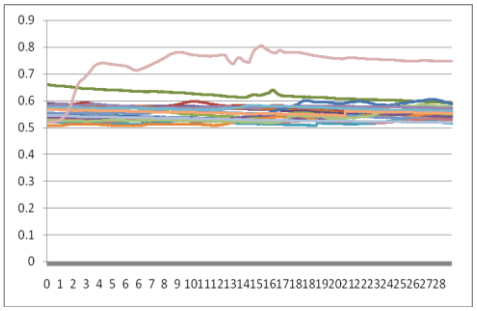
Subject 11 SC responses.



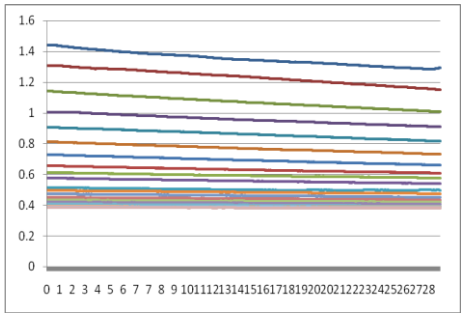
Subject 15 SC responses



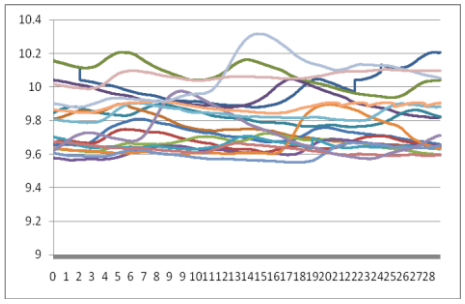
Subject 12 SC responses



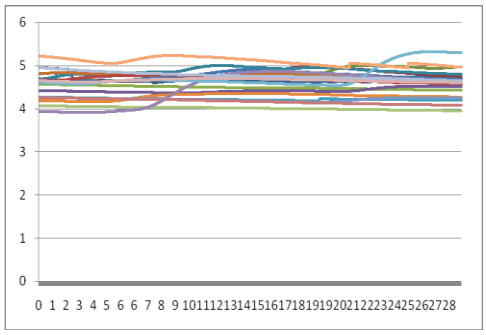
Subject 16 SC responses



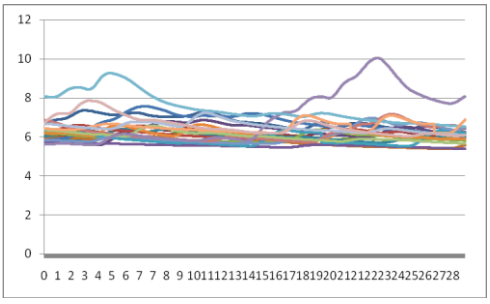
Subject 17 SC responses



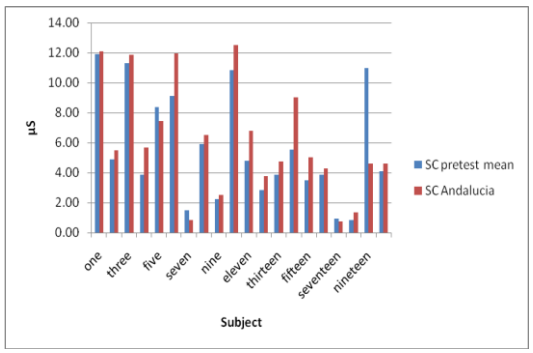
Subject 18 SC responses



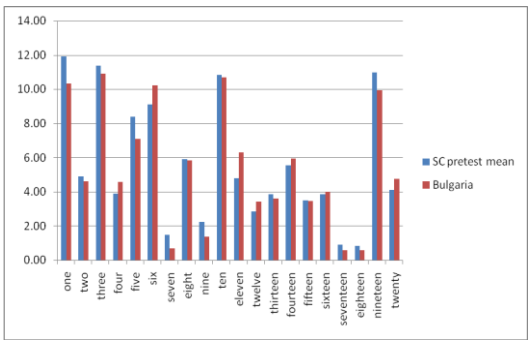
Subject 19 SC responses



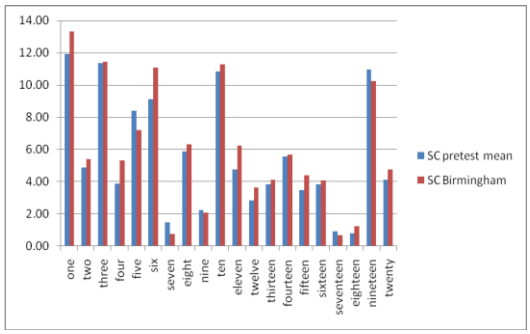
Subject 20 SC responses



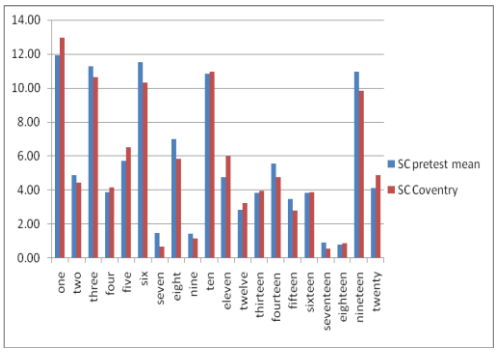
SC responses to Andalucía by all subjects



SC responses to Bulgaria by all subjects



SC responses to Birmingham by all subjects



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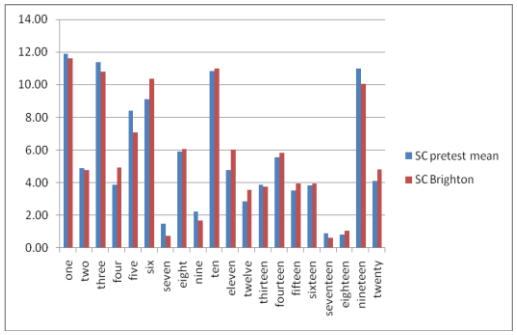
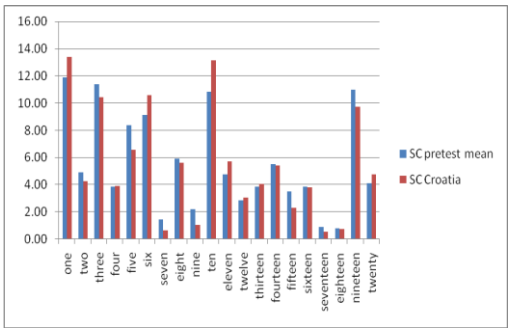
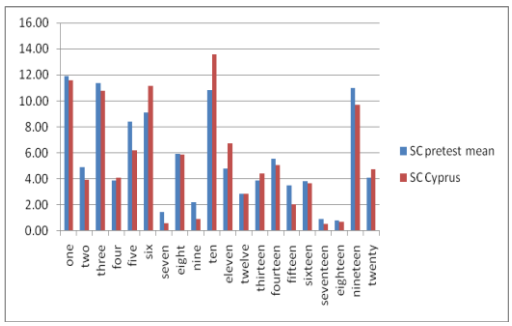
SC responses to Coventry by all subjects



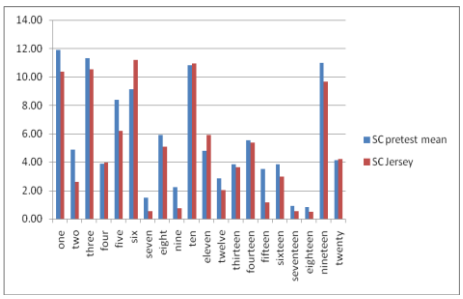
SC responses to Brighton by all subjects



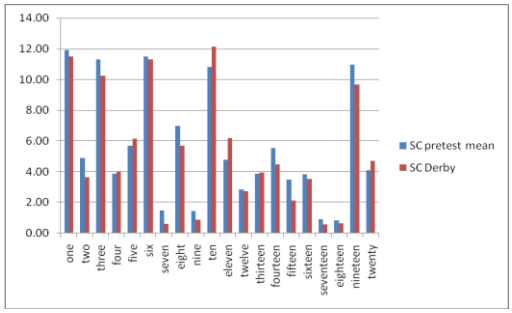
SC responses to Croatia by all subjects



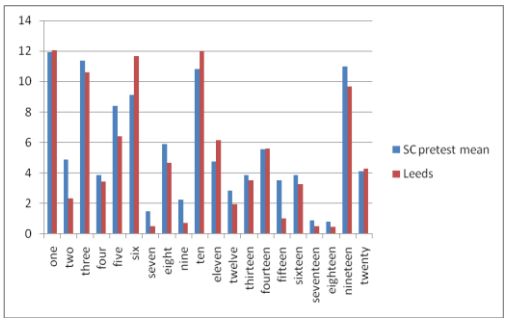
SC responses to Cyprus by all subjects



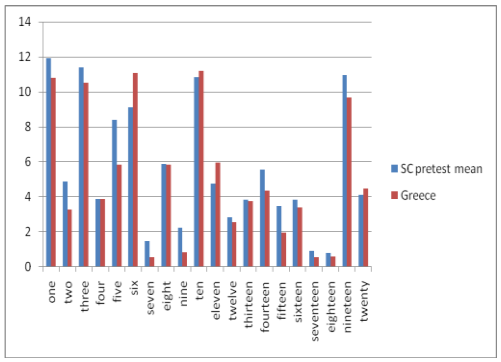
SC responses to Jersey by all subjects



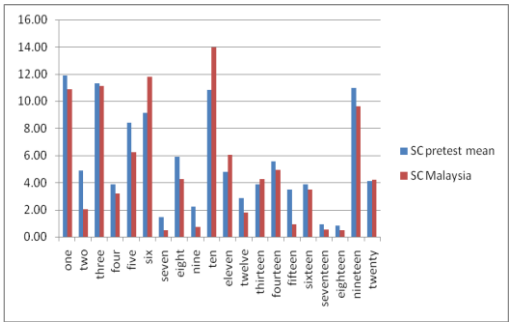
SC responses to Derby by all subjects



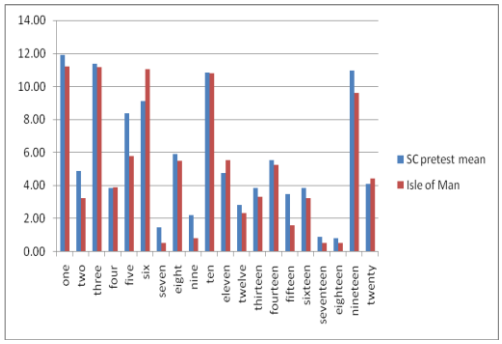
SC responses to Leeds by all subjects



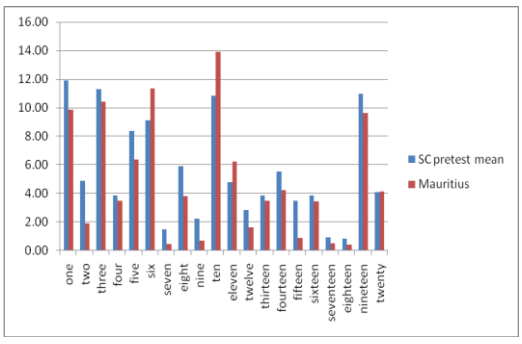
SC responses to Greece by all subjects



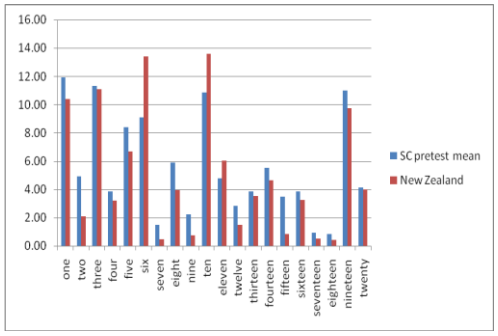
SC responses to Malaysia by all subjects



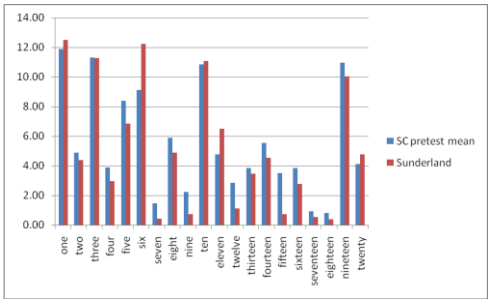
SC responses to Isle of Man by all subjects



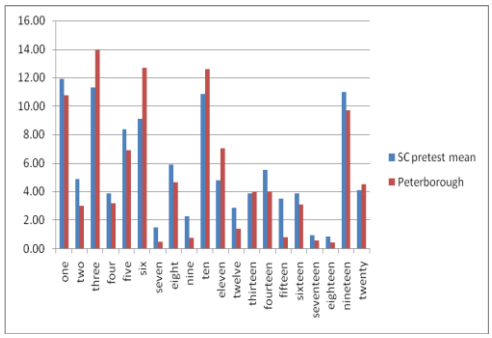
SC responses to Mauritius by all subjects



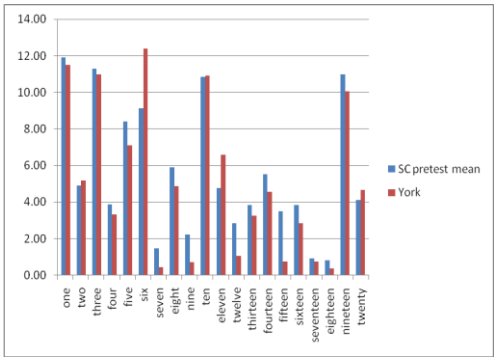
SC responses to New Zealand by all subjects



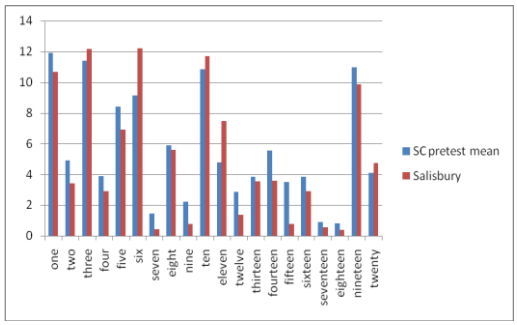
SC responses to Sunderland by all subjects



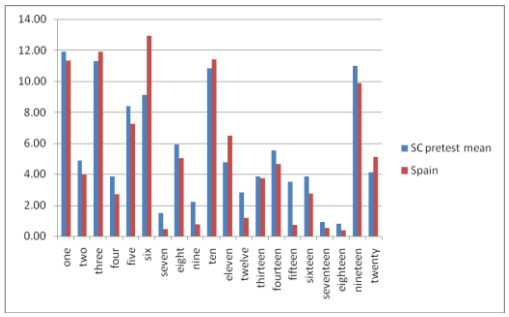
SC responses to Peterborough by all subjects



SC responses to York by all subjects



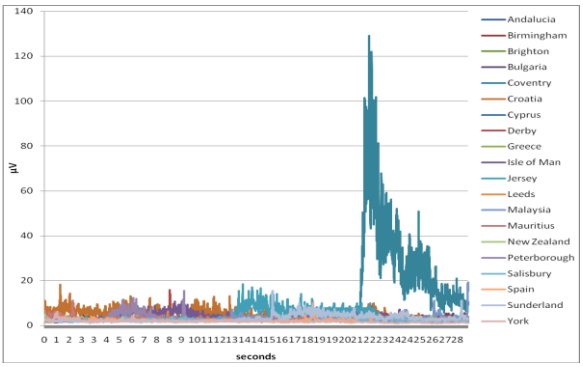
SC responses to Salisbury by all subjects



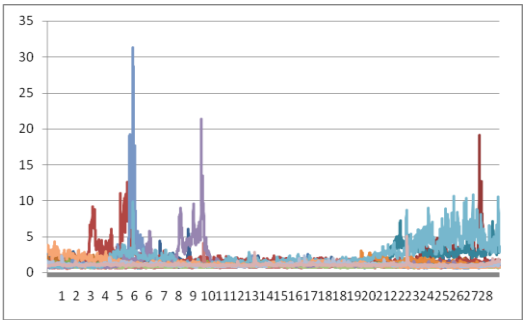
SC responses to Spain by all subjects

Appendix Thirteen

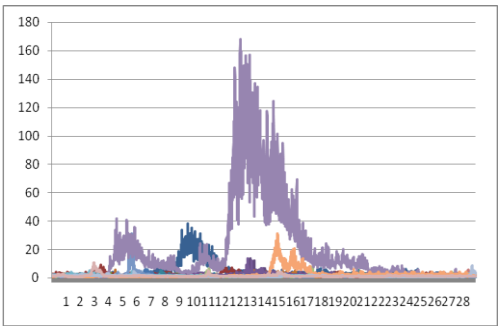
EMG Responses



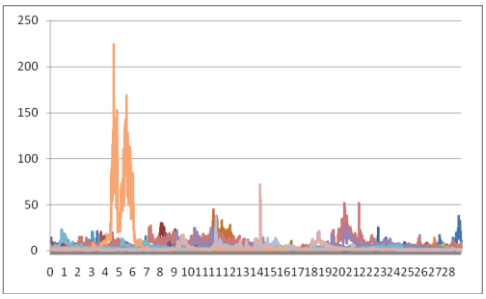
Subject 1 EMG responses to all place adverts



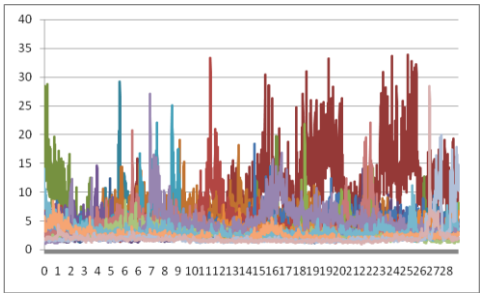
Subject 2 EMG responses to all place adverts



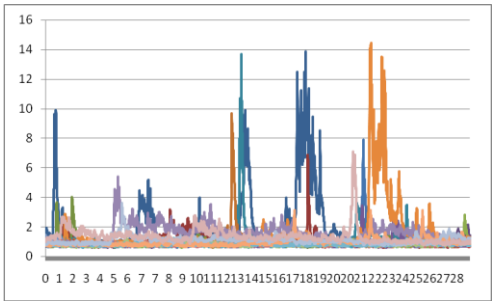
Subject 3 EMG responses to all place adverts



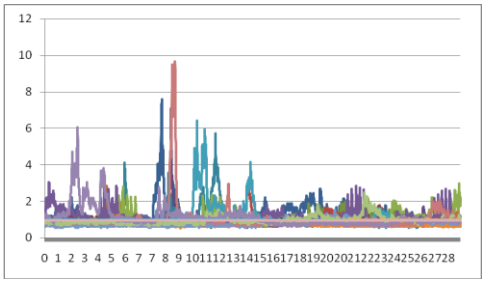
Subject 4 EMG responses to all place adverts



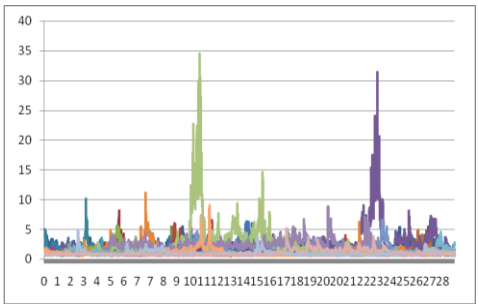
Subject 5 EMG responses to all place adverts



Subject 6 EMG responses to all place adverts



Subject 7 EMG responses to all place adverts



Subject 8 EMG responses to all place adverts

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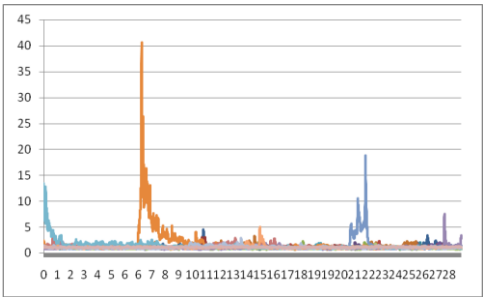
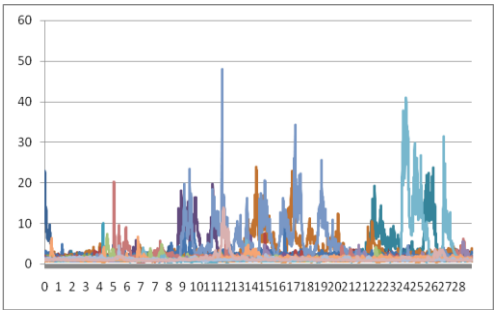
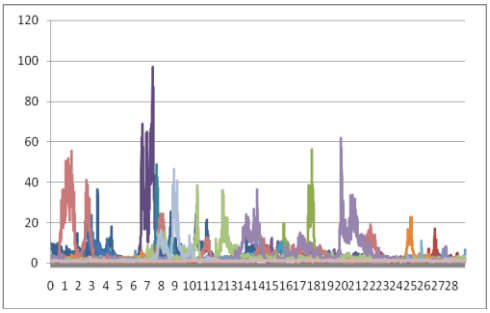


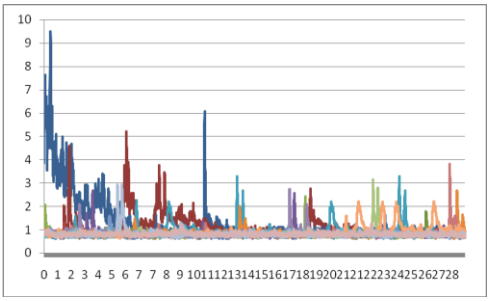
Subject 9 EMG responses to all place adverts



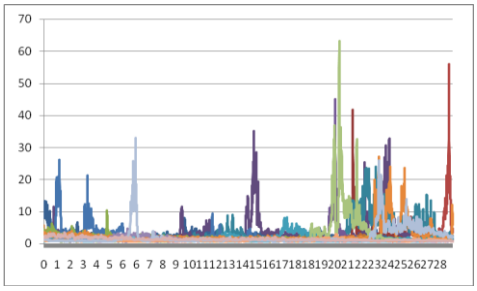
Subject 10 EMG responses to all place adverts



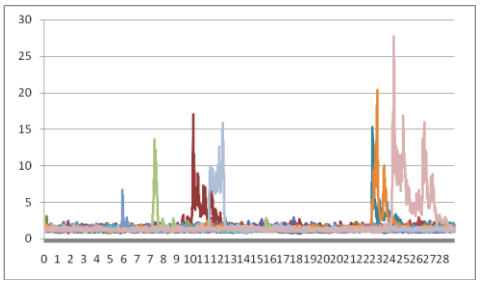
Subject 11 EMG responses to all place adverts



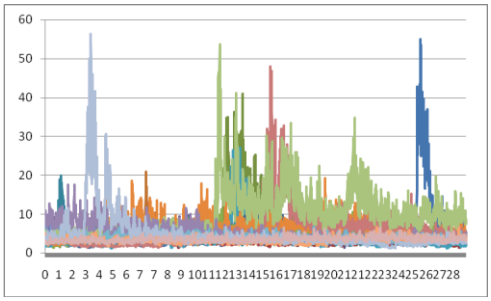
Subject 12 EMG responses to all place adverts



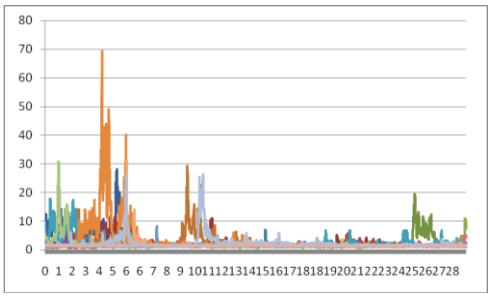
Subject 13 EMG responses to all place adverts



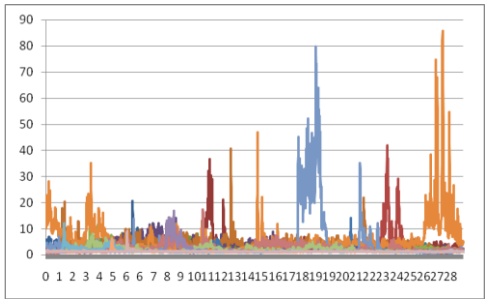
Subject 14 EMG responses to all place adverts



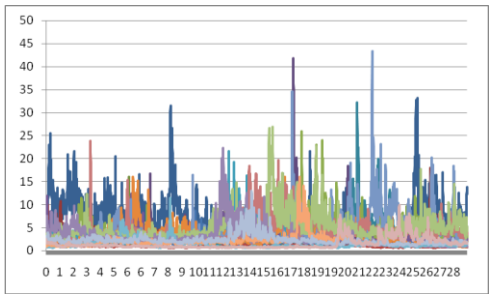
Subject 15 EMG responses to all place adverts



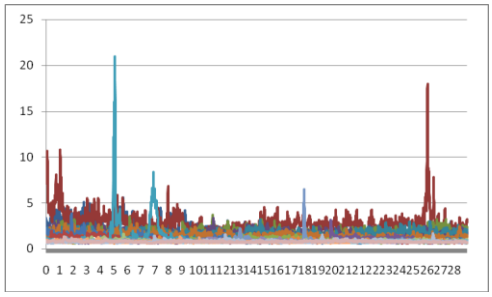
Subject 16 EMG responses to all place adverts



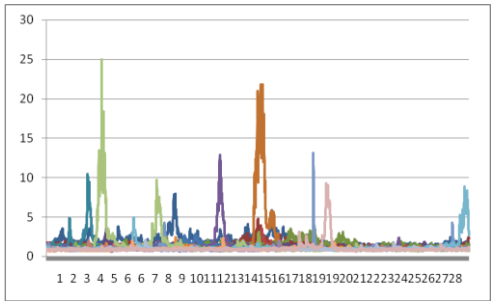
Subject 17 EMG responses to all place adverts



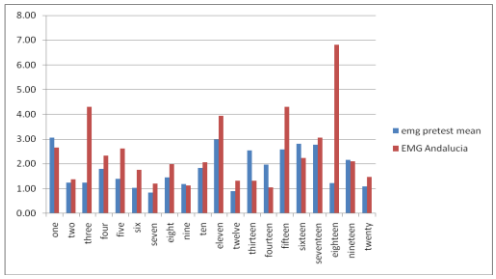
Subject 18 EMG responses to all place adverts



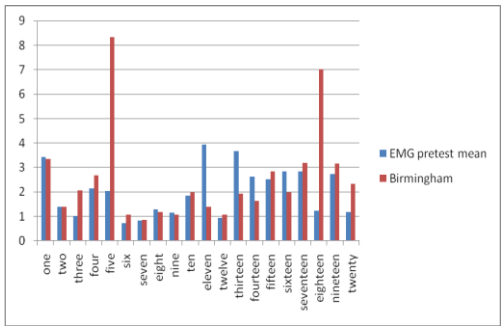
Subject 19 EMG responses to all place adverts



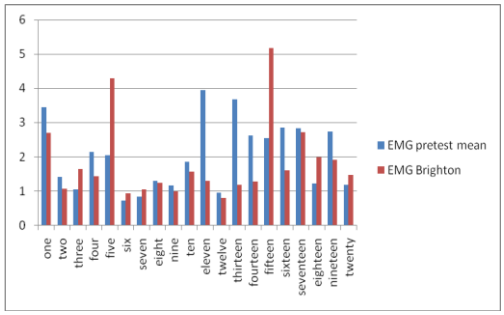
Subject 20 EMG responses to all place adverts



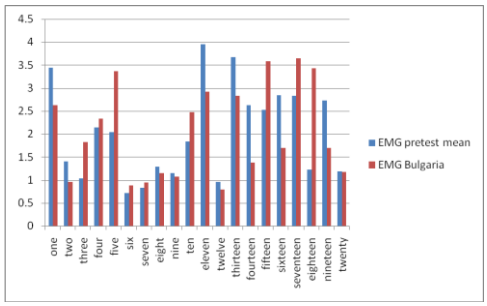
Comparing each subject's mean EMG activity between pre-test and Andalucía



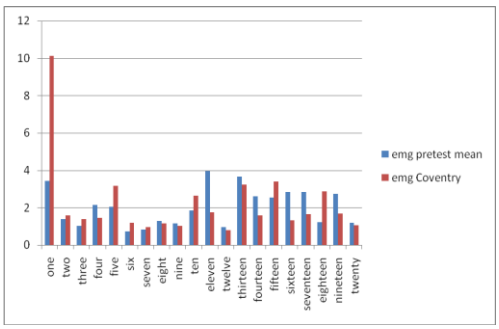
Comparing each subject's mean EMG activity between pre-test and Birmingham



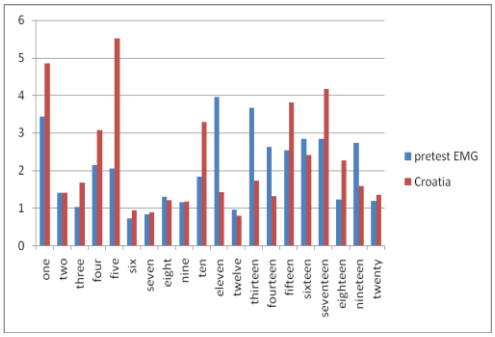
Comparing each subject's mean EMG activity between pre-test and Brighton



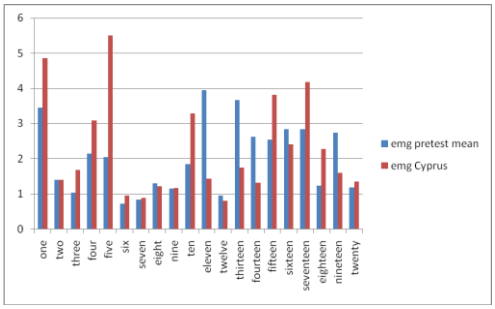
Comparing each subject's mean EMG activity between pre-test and Bulgaria



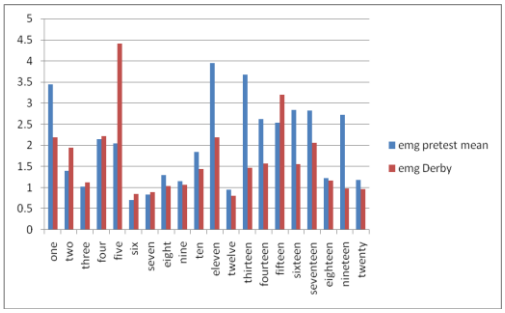
Comparing each subject's mean EMG activity between pre-test and Coventry



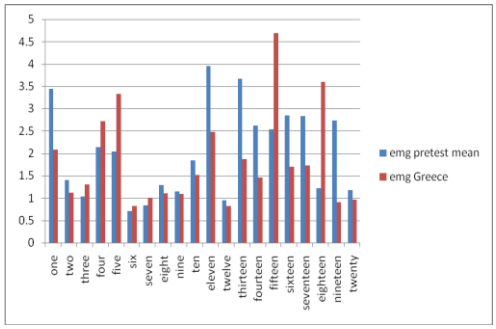
Comparing each subject's mean EMG activity between pre-test and Croatia



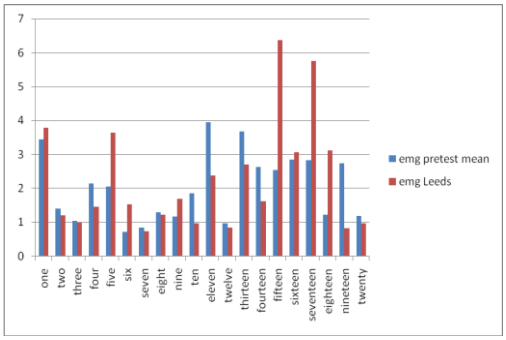
Comparing each subject's mean EMG activity between pre-test and Cyprus



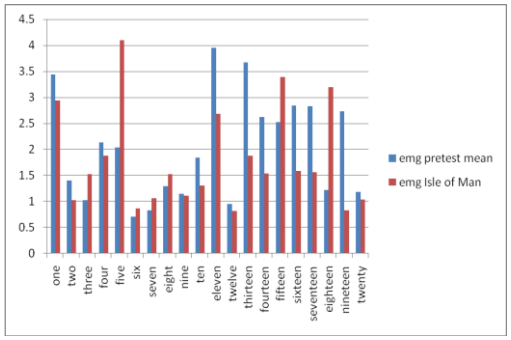
Comparing each subject's mean EMG activity between pre-test and Derby



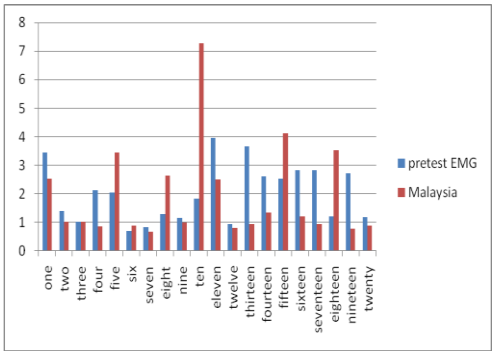
Comparing each subject's mean EMG activity between pre-test and Greece



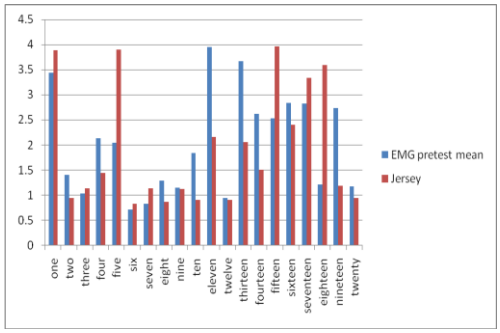
Comparing each subject's mean EMG activity between pre-test and Leeds



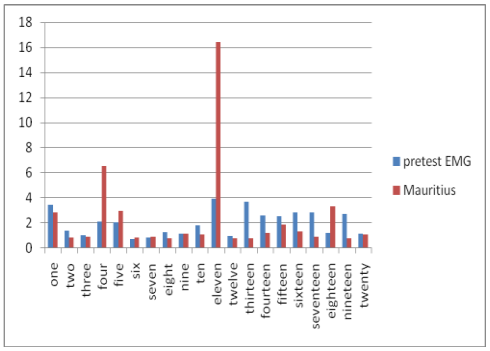
Comparing each subject's mean EMG activity between pre-test and Isle of Man



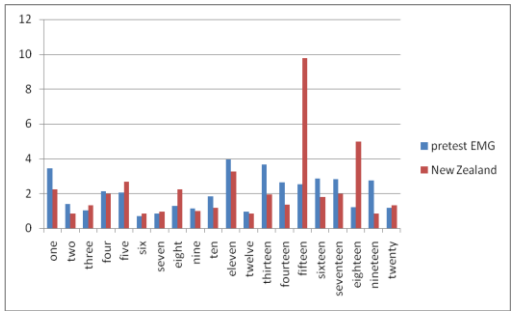
Comparing each subject's mean EMG activity between pre-test and Malaysia



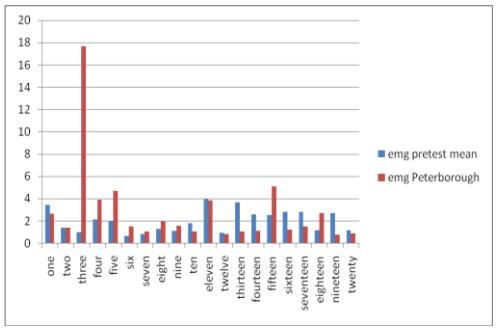
Comparing each subject's mean EMG activity between pre-test and Jersey



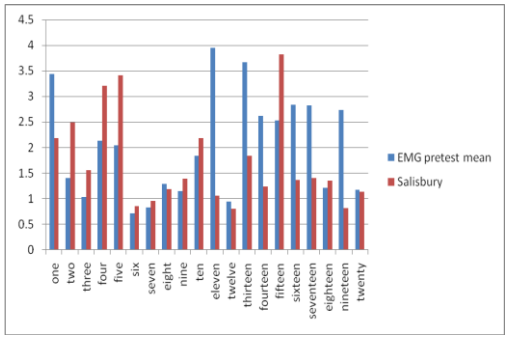
Comparing each subject's mean EMG activity between pre-test and Mauritius



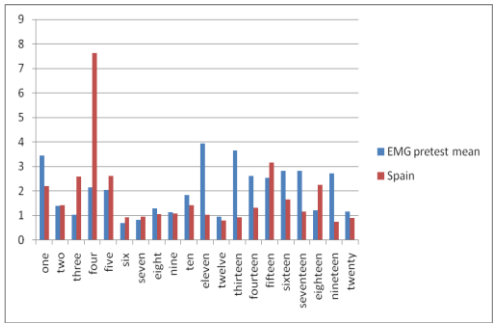
Comparing each subject's mean EMG activity between pre-test and New Zealand



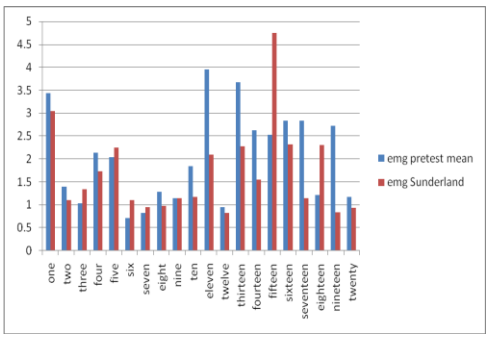
Comparing each subject's mean EMG activity between pre-test and Peterborough



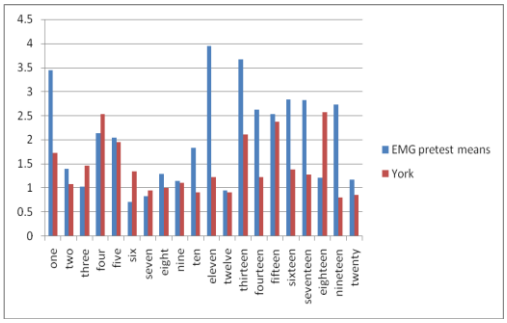
Comparing each subject's mean EMG activity between pre-test and Salisbury



Comparing each subject's mean EMG activity between pre-test and Spain



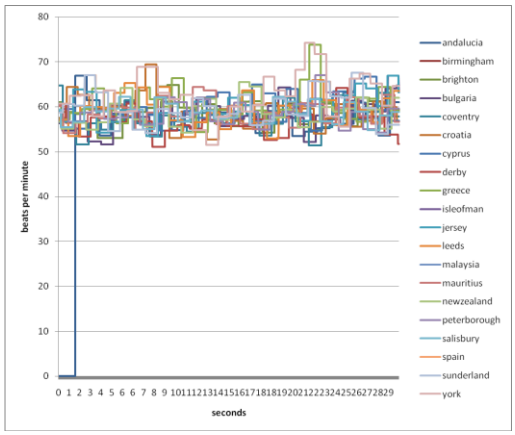
Comparing each subject's mean EMG activity between pre-test and Sunderland



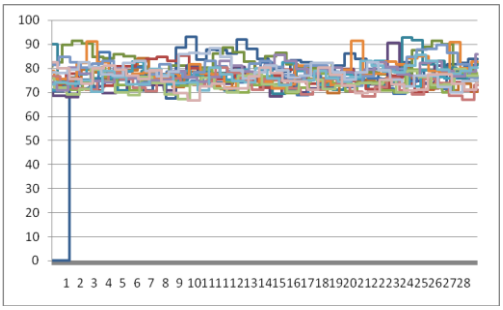
Comparing each subject's mean EMG activity between pre-test and York

Appendix Fourteen

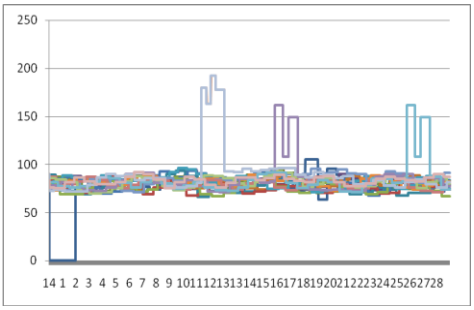
HR Responses



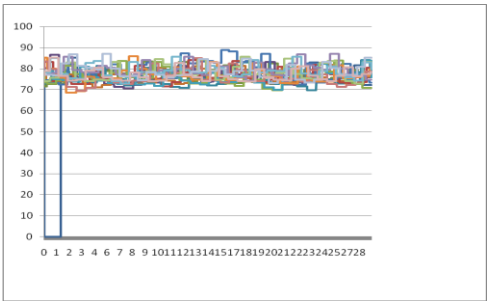
Subject One heart rate responses for all adverts



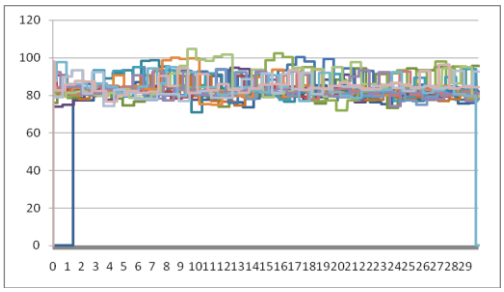
Subject Two heart rate responses for all adverts



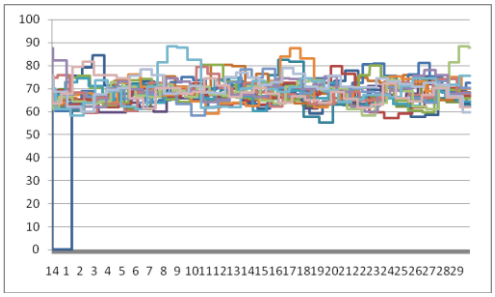
Subject Three heart rate responses for all adverts



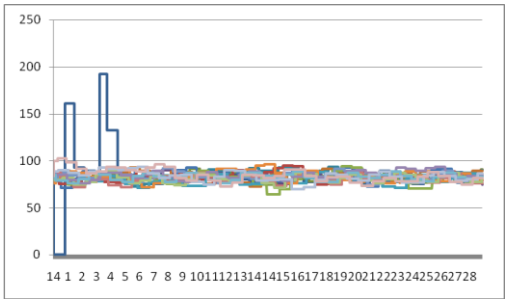
Subject Four heart rate responses for all adverts



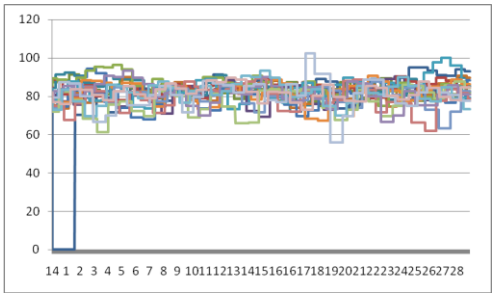
Subject Five heart rate responses for all adverts



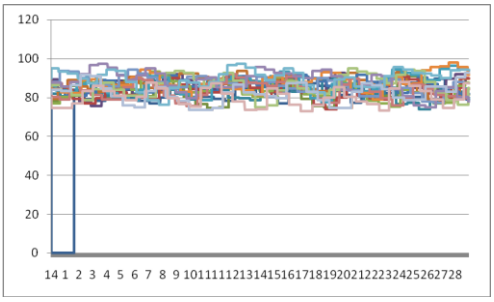
Subject Six heart rate responses for all adverts



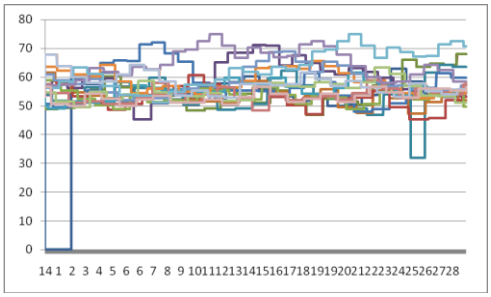
Subject Seven heart rate responses for all adverts



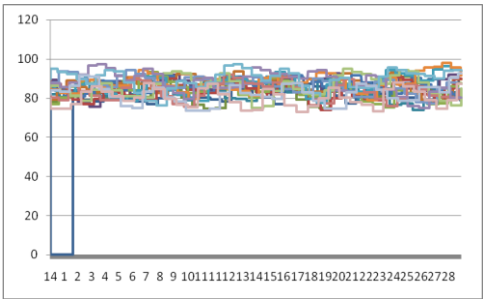
Subject Eight heart rate responses for all adverts



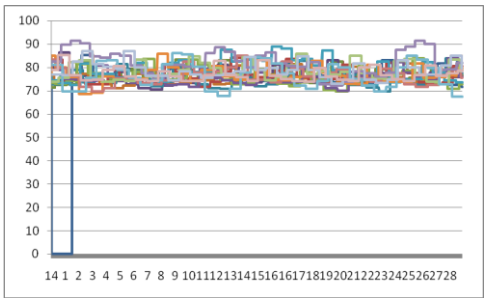
Subject Nine heart rate responses for all adverts



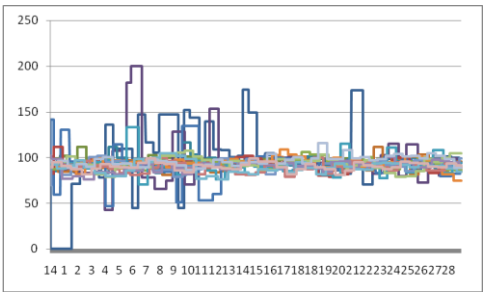
Subject Thirteen heart rate responses for all adverts



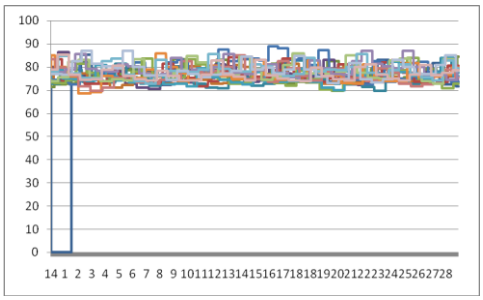
Subject Ten heart rate responses for all adverts



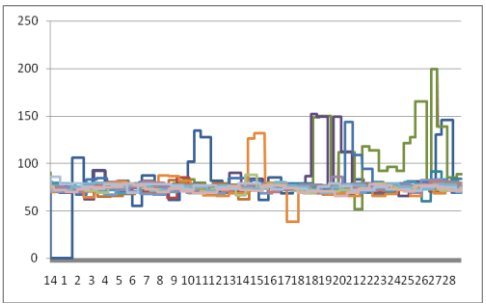
Subject Fourteen heart rate responses for all adverts



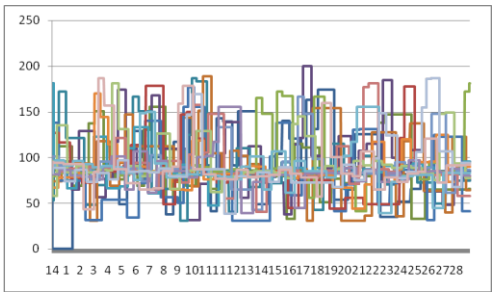
Subject Eleven heart rate responses for all adverts



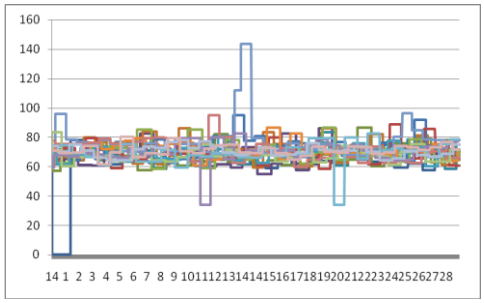
Subject Fifteen heart rate responses for all adverts



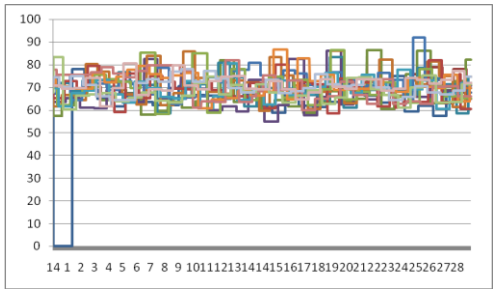
Subject Twelve heart rate responses for all adverts



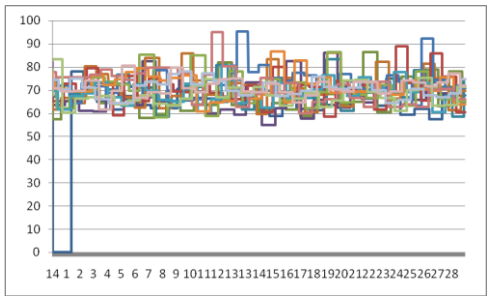
Subject Sixteen heart rate responses for all adverts



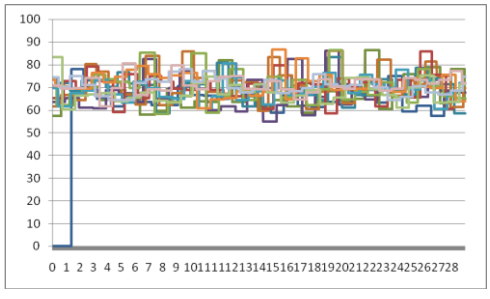
Subject Seventeen heart rate responses for all adverts



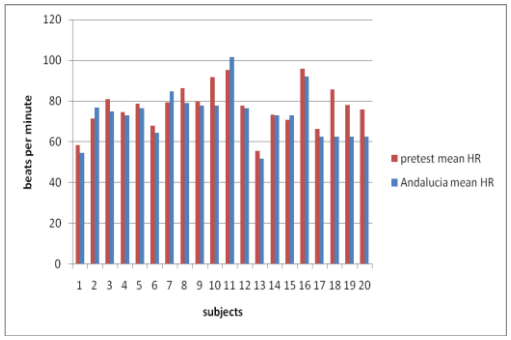
Subject Eighteen heart rate responses for all adverts



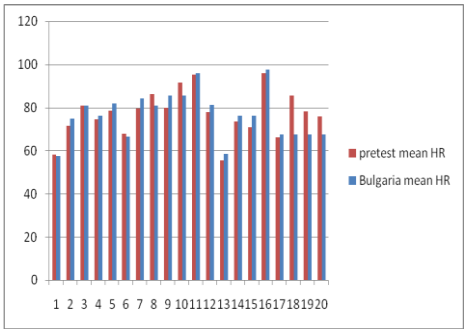
Subject Nineteen heart rate responses for all adverts



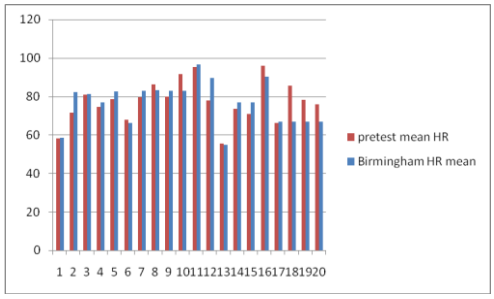
Subject Twenty heart rate responses for all adverts



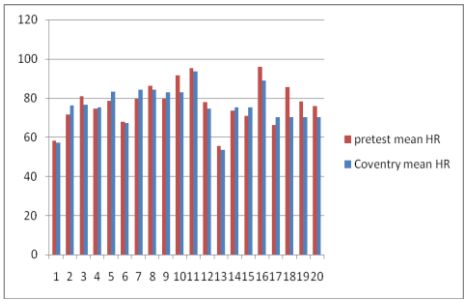
Comparison between mean HR responses by all subjects to Andalucía and mean pre-test HR



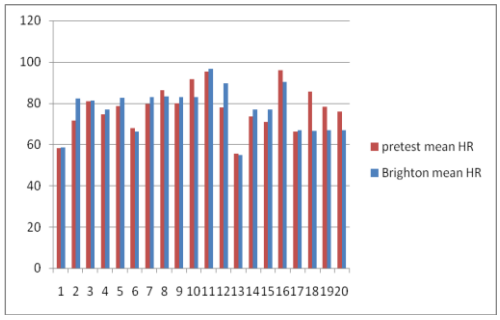
Comparison between mean HR responses by all subjects to Bulgaria and mean pre-test HR



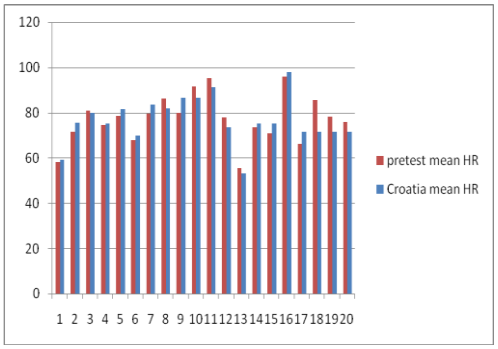
Comparison between mean HR responses by all subjects to Birmingham and mean pre-test HR



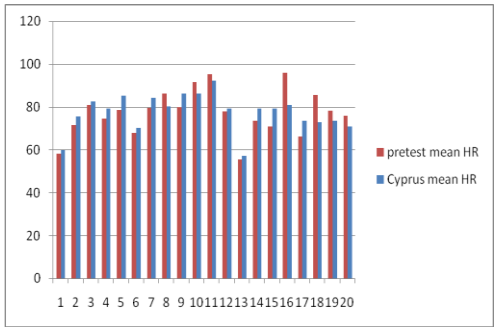
Comparison between mean HR responses by all subjects to Coventry and mean pre-test HR



Comparison between mean HR responses by all subjects to Brighton and mean pre-test HR



Comparison between mean HR responses by all subjects to Croatia and mean pre-test HR



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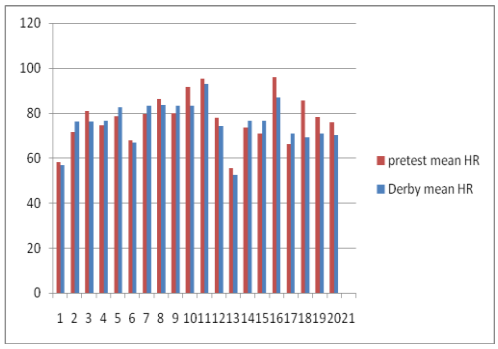
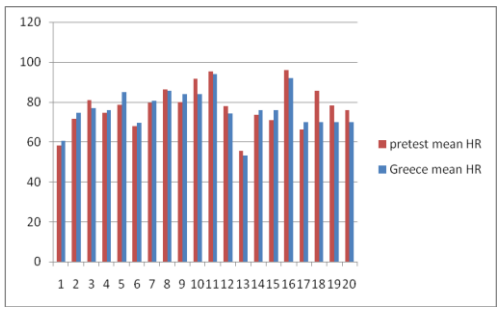
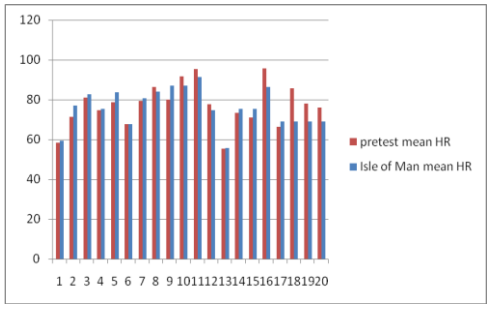


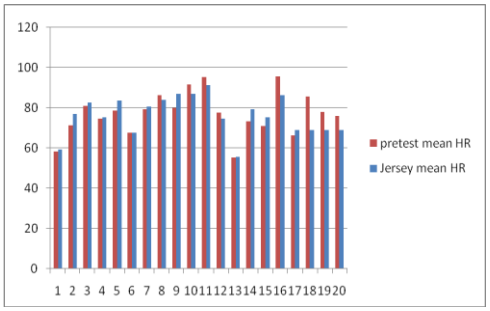
Comparison between mean HR responses by all subjects to Derby and mean pre-test HR



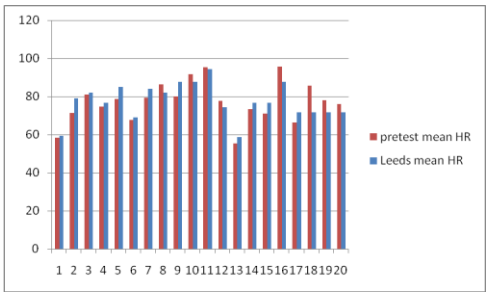
Comparison between mean HR responses by all subjects to Greece and mean pre-test HR



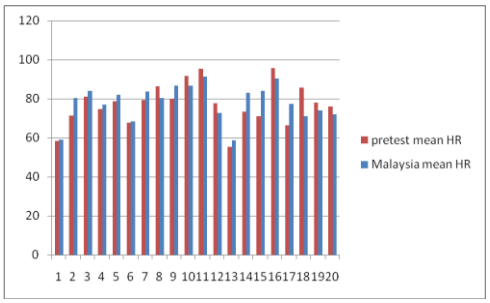
Comparison between mean HR responses by all subjects to Isle of Man and mean pre-test HR



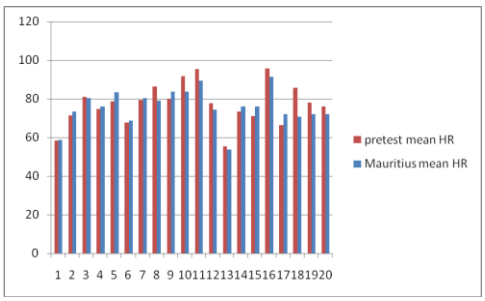
Comparison between mean HR responses by all subjects to Jersey and mean pre-test HR



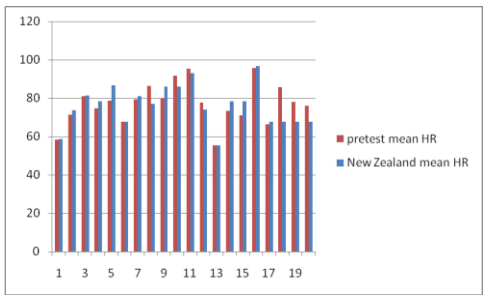
Comparison between mean HR responses by all subjects to Leeds and mean pre-test HR



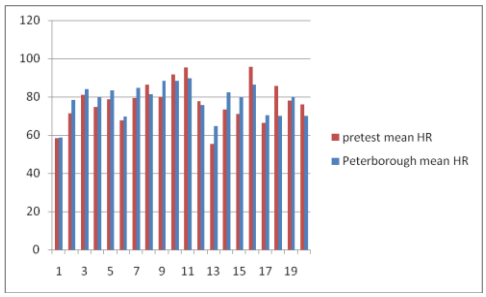
Comparison between mean HR responses by all subjects to Malaysia and mean pre-test HR



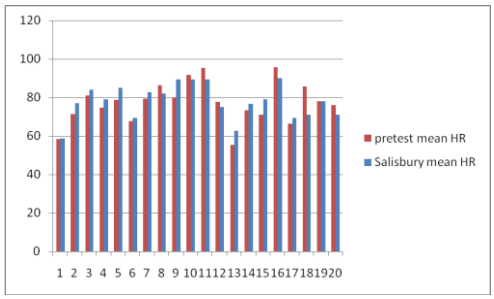
Comparison between mean HR responses by all subjects to Mauritius and mean pre-test HR



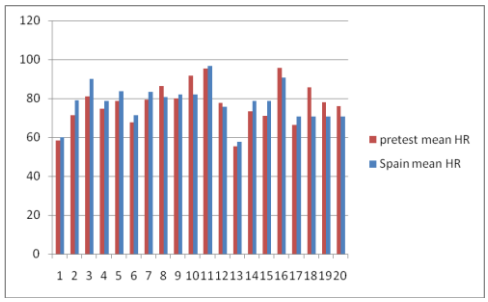
Comparison between mean HR responses by all subjects to New Zealand and mean pre-test HR



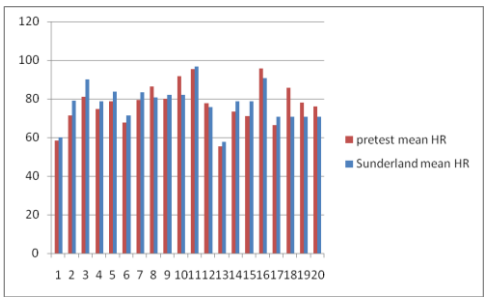
Comparison between mean HR responses by all subjects to Peterborough and mean pre-test HR



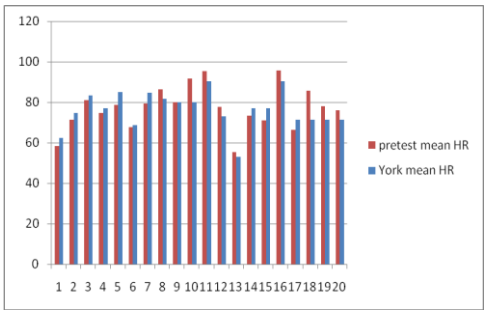
Comparison between mean HR responses by all subjects to Salisbury and mean pre-test HR



Comparison between mean HR responses by all subjects to Spain and mean pre-test HR



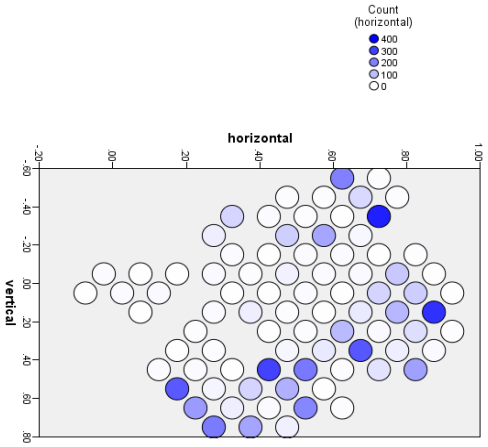
Comparison between mean HR responses by all subjects to Sunderland and mean pre-test HR



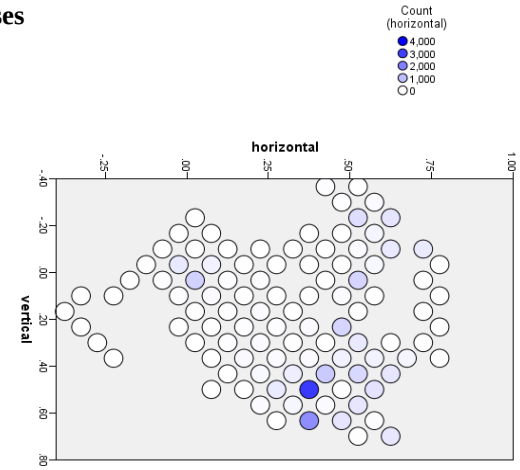
Comparison between mean HR responses by all subjects to York and mean pre-test HR

Appendix Fifteen

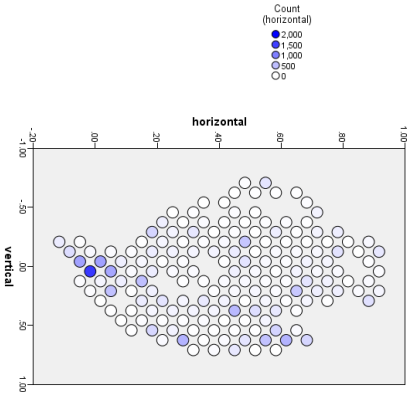
Feeltrace Responses



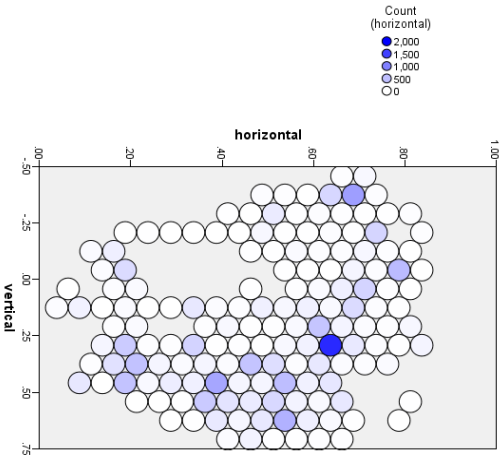
Subject 1 Feeltrace responses: how the subject felt during the adverts



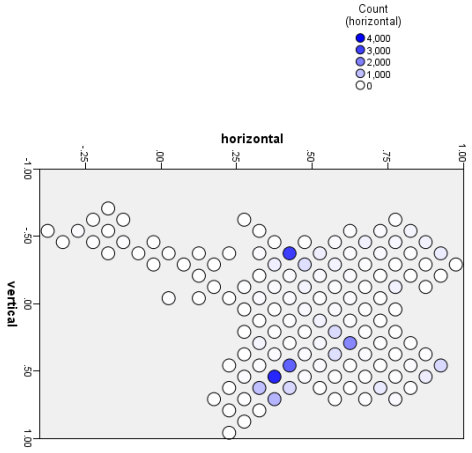
Subject 4 Feeltrace responses: how the subject felt during the adverts



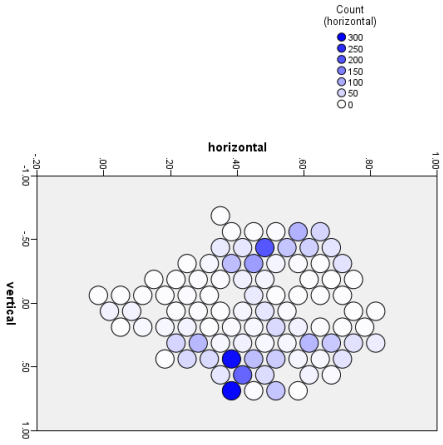
Subject 2 Feeltrace responses: how the subject felt during the adverts



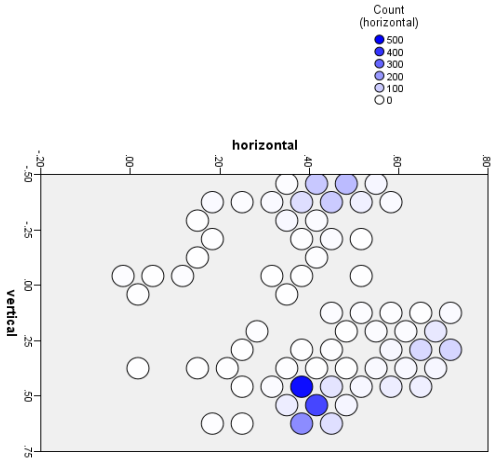
Subject 5 Feeltrace responses: how the subject felt during the adverts



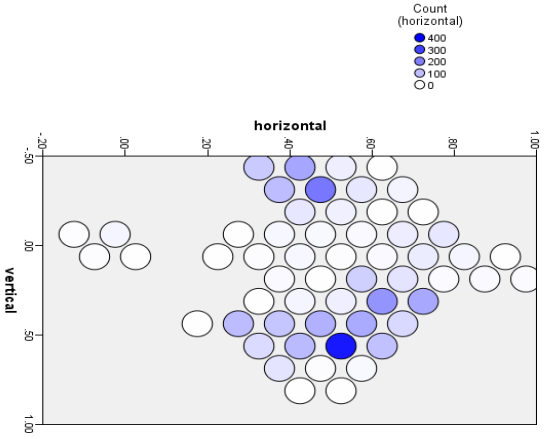
Subject 3 Feeltrace responses: how the subject felt during the adverts



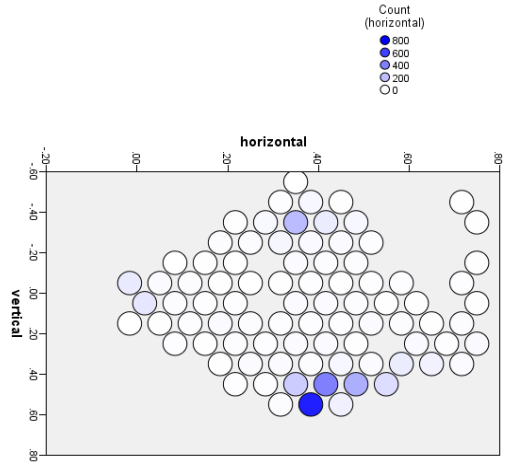
Subject 6 Feeltrace responses: how the subject felt during the adverts



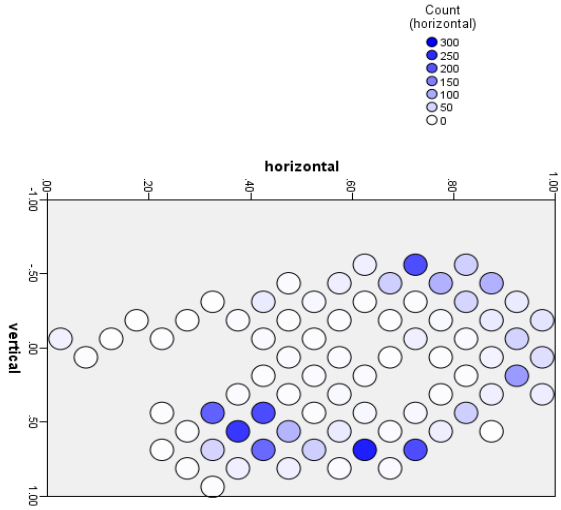
Subject 7 Feeltrace responses: how the subject felt during the adverts



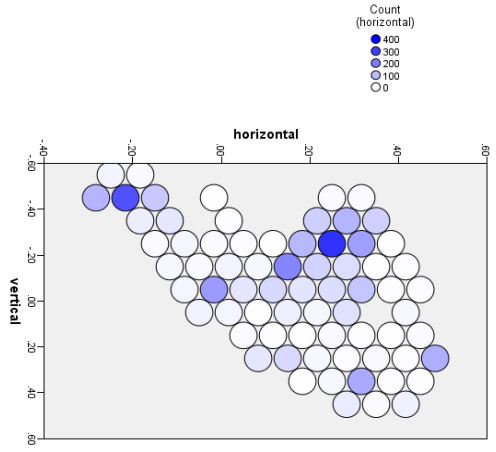
Subject 10 Feeltrace responses: how the subject felt during the adverts



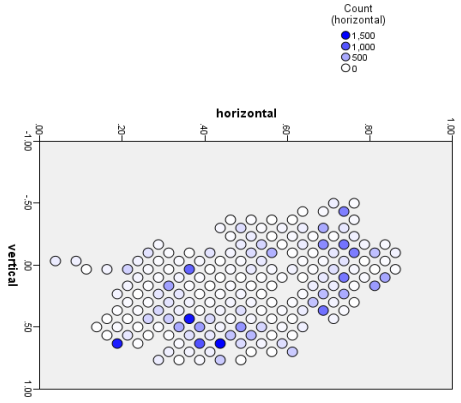
Subject 8 Feeltrace responses: how the subject felt during the adverts



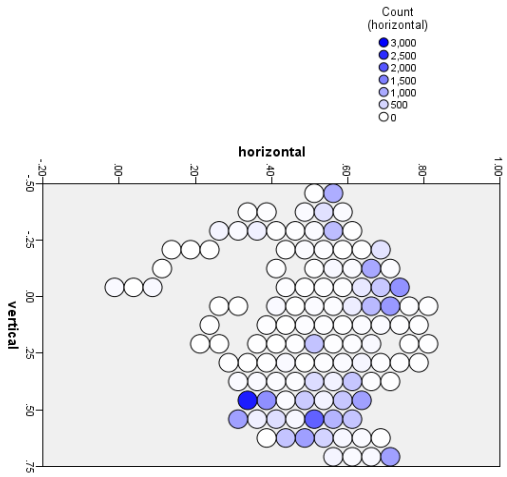
Subject 11 Feeltrace responses: how the subject felt during the adverts



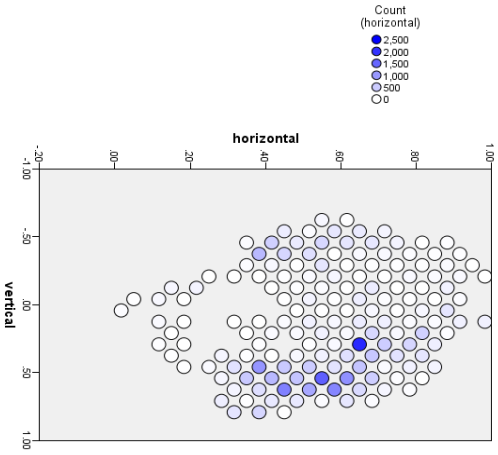
Subject 9 Feeltrace responses: how the subject felt during the adverts



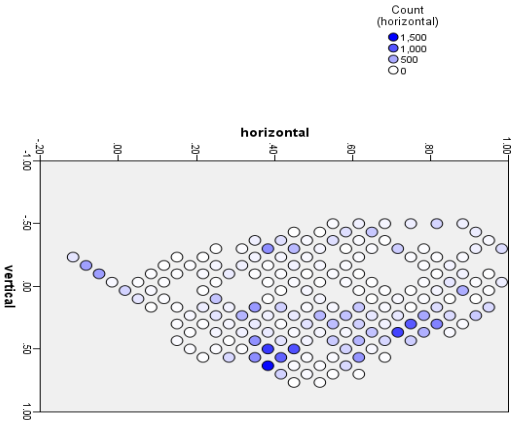
Subject 12 Feeltrace responses: how the subject felt during the adverts



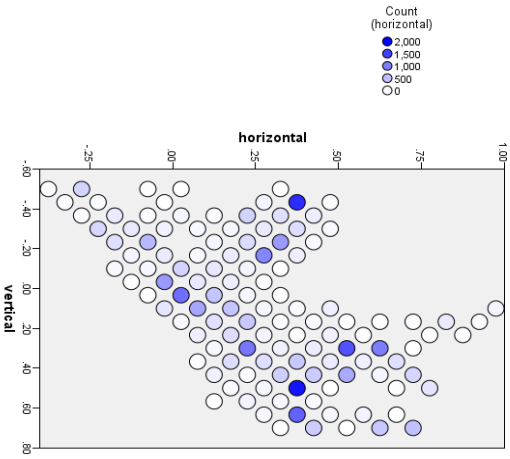
Subject 13 Feeltrace responses: how the subject felt during the adverts



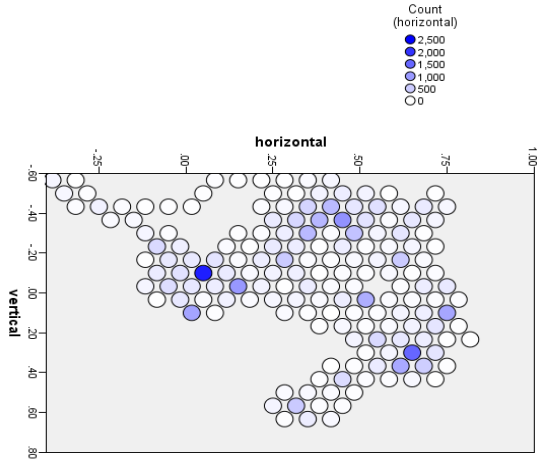
Subject 16 Feeltrace responses: how the subject felt during the adverts



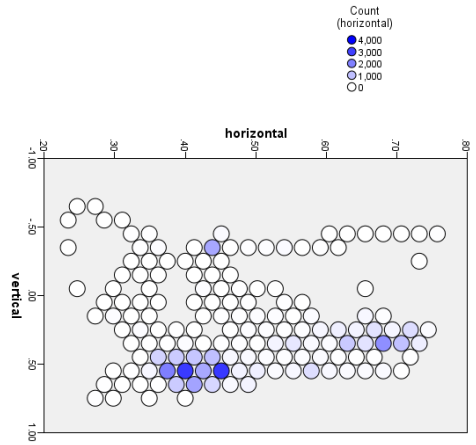
Subject 14 Feeltrace responses: how the subject felt during the adverts



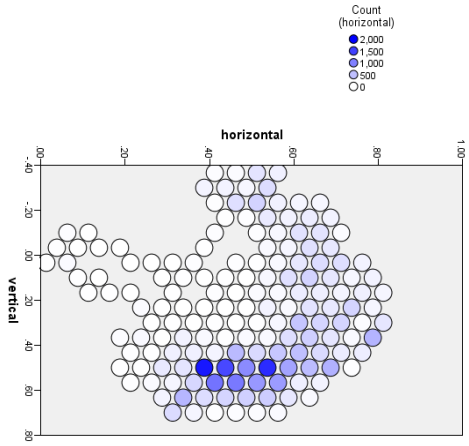
Subject 17 Feeltrace responses: how the subject felt during the adverts



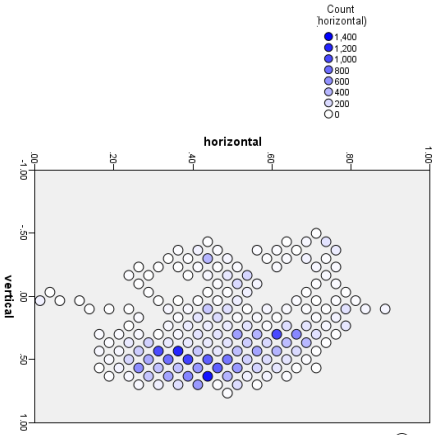
Subject 15 Feeltrace responses: how the subject felt during the adverts



Subject 18 Feeltrace responses: how the subject felt during the adverts



Subject 19 Feeltrace responses: how the subject felt during the adverts



Subject 20 Feeltrace responses: how the subject felt during the adverts

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