Exploring Attitudinal and Psychophysiological Responses towards Visible Difference:

The Role of Shame, Disgust, Self-Esteem and Appearance Schema

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TABLE OF CONTENTS

List of Figures 7
List of Tables 8
Glossary of Abbreviations and Symbols 9
Acknowledgements 10
Abstract 11
Chapter 1: Introduction to the Thesis 12
1.1 Attitudes 14
1.2 Psychophysiology 14
1.3 Aims of this Thesis 15
Chapter 2: What do we Know About What it is Like to Live With a Visible Difference? A Review of the Literature 17
2.1 Search Strategy 17
2.2 Nature, Cause and Epidemiology of Visible Differences 17
2.2.1 Skin Conditions 18
2.3 Impact of a Visible Difference 19
2.3.1 The Psychological Impact of Visible Differences 19
2.4 The Social Impact of Visible Differences 23
2.4.1 Experience of Reactions of Others 23
2.4.2 Observed Behaviours and Reactions Towards Visible Differences .25
2.4.3 Children's Reactions to Visible Differences 27
2.4.4 Differences in Reactions Across Disabilities 28
2.4.5 Psychosocial Interventions 30
2.5 Theories accounting for the impact of reactions of other people towards visible difference 31
2.5.1 Self Discrepancy Theory 32
2.5.2 Stigmatisation Theory 32
2.5.3 Shame 33
2.5.4 Attractiveness 35
2.6 Theories accounting for negative attitudes toward people with a visible difference 35
2.6.1 The SCARED Model 35
2.6.2 Just World Hypothesis 36
2.6.3 Stigmatisation Theory 36
2.6.4 Evolutionary Theories: Disgust, Shame and Attractiveness 37
2.6.5 Summary of Theories 41
2.7 Chapter Overview 42
Chapter 3: Attitudes; Function, Formation and Measurement: A Review of the Literature 44
3.1 Definition 44
3.2 Search Strategy 44
3.3 Attitude Formation and Functionality 44
3.4 Implicit and Explicit Attitudes 46
3.4.1 Explicit Attitudes 46
3.4.2 Implicit Attitudes 47
3.4.3 The Relationship Between Implicit and Explicit Attitudes 47
3.5 Attitude Change/Inhibition 50
3.6 Attitude Measurement 51
3.6.1 Implicit Association Test 53
3.7 Chapter Overview 58

Chapter 4: Psychophysiology: Review of the Literature 59
4.1 Search Strategy 59
4.2 Psychophysiology; Rationale for Use 59
4.2.1 Psychological Rationale for Psychophysiology 60
4.3 Psychophysiology and Emotion 60
4.4 International Affective Picture System 63
4.5 Psychophysiological Measures 65
4.5.1 Heart rate 65
4.5.2 Electrodermal Activity 67
4.5.3 Electromyography 68
4.6 Relevant Studies 70
4.7 Overview 72
Chapter 5: Methodology 73
5.1 Overview of Methodology 73
5.1.1 Experimental Design 73
5.1.2 Selection of Participants 73
5.1.3 Ethical Considerations 73
5.2 Psychological Variables 74
5.2.1 Disgust, Shame and Appearance Concern 74
5.2.2 Measures of Psychological Distress 76
5.2.3 Measure of Motivation 77
5.2.4 Questionnaire Analysis 77
5.3 Explicit Measures 77
5.3.1 Feeling Thermometer 77
5.3.2 Semantic Differential 78
5.3.3 Demographic Variables 78
5.4 The Implicit Association Test 78
5.4.1 Target Stimuli (Skin Condition / Clear Skin) 78
5.4.2 Attribute Stimuli (Pleasant / Unpleasant) 80
5.4.3 Equipment 80
5.4.4 Design and Procedure 80
5.4.5 Data Quantification 82
5.5 Psychophysiology 85
5.5.1 Setting 85
5.5.2 Stimuli 85
5.5.3 Psychophysiological Recording 87
5.5.4 Psychophysiological Equipment 90
5.5.5 Electrode Care 90
5.5.6 Psychophysiological Procedure 91
5.6 Self Assessment Mannequin 91
5.6.1 Stimuli 92
5.6.2 Design 92
5.7 Power Analysis 92
5.8 Chapter Overview 93
Chapter 6: Study 1; Implicit and Explicit Attitudinal Responses, and Psychophysiological Reactions to Skin Conditions 94
6.1 Introduction 94
6.1.1 Aims 95
6.1.2 Hypotheses 96
6.2 Methodology 98
6.2.1 Design 98
6.2.2 Measures 98

6.2.3 Procedure 98
6.3 Results 99
6.3.1 Participants 99
6.3.2 Demographic Variables 100
6.3.3 Data Quantification 100
6.3.4 Questionnaire Measures 100
6.3.5 Explicit Measures and Individual Differences 102
6.3.6 Implicit Association Test 104
6.3.7 Correlations between the Implicit Association Test and Explicit Measures 105
6.3.8 Psychophysiology 107
6.3.9 Self Assessment Mannequin and Ratings 114
6.4 Discussion 115
6.4.1 Explicit Measures 115
6.4.2 Implicit Association Test 116
6.4.3 Psychophysiology 120
6.4.4 Disgust, Shame and Appearance 123
6.4.5 Limitations 123
6.4.6 Relationship to Visible Difference 124
6.4.7 Overview 125
Chapter 7: Study 2; Personalising the Implicit Association Test 127
7.1 Introduction 127
7.1.1 Aims 128
7.1.2 Hypotheses 129
7.2 Method 129
7.2.1 Design 129
7.2.2 Measures 129
7.2.3 Procedure 130
7.3 Results 130
7.3.1 Participants 130
7.3.2 Demographic Measures 130
7.3.3 Explicit Measures 131
7.3.4 The Implicit Association Test 132
7.3.5 Correlations Between the Implicit Association Test and Explicit Measures 135
7.4 Discussion 135
7.4.1 Discussion of Hypotheses 135
7.4.2 Interaction Between the Implicit Association Test, External Motivation and Knowledge 138
7.4.3 Explicit Measures 138
7.4.4 Implications for Visible Difference Research 139
7.4.5 Limitations 140
7.4.6 Conclusion and Future Research 140
Chapter 8: Study 3; Gender Differences in the Implicit Association Test 142
8.1 Introduction 142
8.1.1 Aims 143
8.1.2 Hypotheses 143
8.2 Method 143
8.2.1 Design 143
8.2.2 Measures 144
8.2.3 Procedure 145
8.3 Results 145

8.3.1 Participants....145
8.3.2 Demographic Measurements....146
8.3.3 Explicit Measures....146
8.3.4 The Implicit Association Test....147
8.3.5 Correlations Between the Implicit Association Test and Explicit Measures....149
8.4 Discussion....149
8.4.1 Hypotheses....149
8.4.2 Explicit Measures....150
8.4.3 Implications for Visible Difference....151
8.4.4 Limitations....151
8.4.5 Conclusions and Future Research....152
Chapter 9: Study 4; Comparisons Between People With A Current Skin Condition and Those Without....153
9.1 Introduction....153
9.1.1 Aims....155
9.1.2 Hypotheses....155
9.2 Method....157
9.2.1 Design....157
9.2.2 Measures....157
9.2.3 Procedure....159
9.3 Results....161
9.3.1 Participants....161
9.3.2 Demographic Variables....161
9.3.3 Data Quantification....162
9.3.4 Questionnaire Measures....162
9.3.5 Explicit Measures and Individual Differences....165
9.4 Implicit Association Test....166
9.4.2 Psychophysiology....167
9.4.3 Self Assessment Mannequin and Ratings....170
9.5 Discussion....171
9.5.1 Explicit Attitudes....171
9.5.2 Implicit Association Test....172
9.5.3 Psychophysiology....174
9.5.4 Individual Difference Variables and Gender....175
9.5.5 Relationship to Visible Difference....176
9.5.6 Limitations....177
9.5.7 Overview....179
Chapter 10: Discussion....180
10.1 Resume of Aims....180
10.2 Summary of Studies....180
10.2.1 Study 1....180
10.2.2 Study 2....181
10.2.3 Study 3....182
10.2.4 Study 4....183
10.2.5 Overview....184
10.3 Explicit Measures and Psychological Factors....185
10.4 Implicit Association Test Studies....187
10.5 Psychophysiology Studies....189
10.6 Limitations....189
10.6.1 General Limitations....189
10.6.2 Skin conditions....189

10.6.3 Main Research 194
10.7 Future Research Assessing Attitudinal Responses 199
10.7.1 Skin Conditions Versus the Wider Field of Visible Difference 199
10.7.2 Stimuli 199
10.7.3 Knowledge Effects 200
10.7.4 Implicit and Psychophysiological Measures 200
10.7.5 Explicit Measures 201
10.7.6 Individual Difference Measures 201
10.7.7 Attitudes within a Clinical Sample 202
10.8 Implications and Summary 202
References 204
Table of Appendices 229

LIST OF FIGURES

Chapter 2
Figure 2-I: Partridge's SCARED Model 36
Chapter 4
Figure 4-I: The Self-Assessment Mannequin 64
Figure 4-II: Measurement Parameters of a Phasic Electrodermal Response 68
Chapter 5
Figure 5-III Screenshots – Phase 3 (congruent) and 5 (incongruent) 81
Figure 5-IV: Plan of Experimental Room (not to scale) 85
Figure 5-V: Images Plotted in Affective Space 86
Figure 5-VI: Muscle Sites for Electrode Attachment 89
Chapter 6
Figure 6-I: Approximate Time Line (minutes) 99
Figure 6-II: Correlation Matrix; Individual Differences 102
Figure 6-III: Correlation Matrix; Explicit Measures & Individual Differences 103
Figure 6-IV: Mean IAT Scores for Congruent and Incongruent Conditions 104
Figure 6-V: Interaction between Knowledge, Positive Self-Esteem and the IAT: Simple Slopes for Knowledge at Three Levels of Self-Esteem. 106
Figure 6-VI: A Graph of Heart Rate Change by Seconds and Category 108
Figure 6-VII: Low and High Positive Self-Esteem 109
Figure 6-VIII: Low and High IAT Preference for Clear Skin 110
Figure 6-IX: External Motivation Scale (EMS), Time 1; Clear Skin and Skin Condition 111
Figure 6-X: IAT, Time 2, Clear Skin and Skin Condition 111
Figure 6-XI: EMG across All Categories 112
Figure 6-XII: Effects of Low and High OAS for Levator across the Categories 113
Figure 6-XIII: Arousal and Valence plotted in Affective Space 114
Figure 6-XIV: Ratings of Attractiveness by Gender 115
Chapter 7
Figure 7-I: Correlations; Explicit Measures & Motivation 132
Figure 7-II: Reaction Times in Milliseconds for Congruent and Incongruent Responses. 133
Figure 7-III: IAT Difference Times across Conditions 133
Figure 7-IV: Interaction Between Knowing Someone with a Skin Condition, External Motivation: Simple Slopes for Knowledge at Three levels of EMS 135
Chapter 8
Figure 8-I: Examples of Pictures Used (Skin Conditions) 144
Figure 8-II: Examples of Pictures Used (Clear Skin) 145
Figure 8-III: Correlations; Explicit Measures & Motivation 147
Figure 8-IV: Reaction Times in Milliseconds for Congruent and Incongruent Responses. 148
Chapter 9
Figure 9-I: Correlation Matrix of Scales and All Participants 164
Figure 9-II: Correlations; Explicit Measures & Individual Differences 166
Figure 9-III: Correlations; DLQI, Shame & Explicit Measures 166
Figure 9-IV: Mean IAT Scores for Congruent and Incongruent Conditions 167
Figure 9-V: A Graph of Heart Rate Change by Seconds and Category 168
Figure 9-VI: EMG across All Categories 169
Figure 9-VII: Effects of Low and High IAT Preference across 5 Categories. 170
Figure 9-VIII: Arousal and Valence plotted in Affective Space 171

LIST OF TABLES

Chapter 5
Table 5-I: How Participants were asked to Categorise Stimuli 81
Table 5-II: Data Used Within Each Analysis 84
Chapter 6
Table 6-I: Cronbach Alphas of Questionnaire Measures 101
Table 6-III: Means and Standard Deviation by Gender for the Questionnaire Measures 104
Table 6-IV: Hierarchical Regression of IAT, Knowing Someone with a Skin Condition, Positive Self-Esteem and the Interaction Term 106
Chapter 7
Table 7-I: Breakdown of Participants per Group 130
Table 7-II: Hierarchical Regression of IAT on Knowing Someone with a Skin Condition, External Motivation and Interaction Term 134
Chapter 8
Table 8-I: Breakdown of Participants per Group 145
Chapter 9
Table 9-I: Age and Gender of Recruited Groups 161
Table 9-II: Means and Alphas for the Scales 162
Table 9-III: Group Comparisons Using DLQI 164

GLOSSARY OF ABBREVIATIONS AND SYMBOLS

Ag/AgCl	Silver/Silver Chloride
ASI-r	Appearance Schema Inventory (revised)
BPM	Beats per Minute
CBT	Cognitive Behavioural Therapy
Cm	Centimetre
DLQI	Dermatology Life Quality Index
DR	Defence Response
ECG	Electrocardiogram
EDA	Electrodermal Activity
EDR	Electrodermal Response
EEG	Electroencephalogram
EMG	Electromyogram
EMS	External Motivation Scale
fMRI	Functional Magnetic Resonance Imaging
HADS	Hospital Anxiety and Depression Scale
Hz	Hertz
IAPS	International Affective Picture System
IAT	Implicit Association Test
ID	Inner Diameter
ISS	Internal Shame Scale
ITI	Intertrial Interval
IMS	Internal Motivation Scale
MAPs	Muscle Action Potentials
Mm	Millimetre
Ms	Millisecond
NaCl	Sodium Chloride IMS
OAS	Other as Shamer Scale
OD	Outer Diameter
OR	Orienting Response
PNS	Parasympathetic Nervous System
RPA	Response Parameter Analysis
SAM	Self Assessment Mannequin
SAHP	Social Attention Holding Power
SCR	Skin Conductance Response
SNS	Sympathetic Nervous System
SSS	Skin Shame Scale
WL	Wilks Lambda

χ^2	Chi Square
η^2	Eta Square
$\bar{x}$	Mean
$\overline{R}$	Mean Rank
σ	Standard Deviation

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ABSTRACT

Skin conditions can result in an acquired visible difference. It is widely acknowledged that whilst the majority of people with a visible difference cope well, some experience a variety of psychosocial problems. Many of these difficulties are linked to the intrusive reactions people receive from members of the general public, and the individual's own perception of those reactions. Therefore, exploring reactions towards visible difference and the psychological variables associated with them is crucial to the development of interventions. These studies are the first to explore responses to visible differences using the Implicit Attitude Test (IAT) and psychophysiology to investigate their relationship to psychological variables. In addition, no other studies have compared a clinical and a control group's reactions to visible difference.

Four studies were conducted; the first utilises the IAT, psychophysiology and explicit attitude measures to explore responses towards visible difference. The relationship of psychological variables to these measures was also investigated. The second study examined effects of knowledge, and 'personalising' the IAT. The third study considered gender within and in response to stimuli within the IAT. The final study largely replicated the first but included a clinical sample of dermatology patients, enabling their reactions to be explored in relation to the psychological variables, and for differences between this population and a control group to be examined.

A consistent implicit and explicit preference for clear skin over skin conditions was found, lending support to the notion that reactions toward visible difference are in many ways automatic. The psychological variables of shame, disgust and appearance schema appeared more important in accounting for responses than effects of knowledge or having personally experienced a skin condition. Participants with a skin condition and low quality of life had high levels of shame and disgust, indicating the importance of these psychological constructs in adjustment to an appearance altering condition.

Chapter 1: Introduction to the Thesis

Within the United Kingdom, over 600,000 people have a 'severe' visible difference[1], which adversely affects their life. Visible differences take many forms, they can be acquired throughout a lifetime through accident or disease, or someone may be born with a visible difference (Lansdown, 1997). People who have a visible difference can experience a variety of problems such as low self-esteem and difficulties in relationships (Rumsey, Clarke, White, Wyn-Williams, and Garlick, 2004; Thompson, Kent, and Smith, 2002). Many of the problems experienced are attributed to the reactions of the general public or the individual's perceptions of these. Understanding the factors underlying reactions towards visible difference is essential to both considering how to develop interventions to change such reactions, and helping to change the negative psychological impact for people with a visible difference. This thesis explores these reactions and the psychological components associated with them.

Chapter 2 of this thesis reviews the literature looking at visible difference in general, skin conditions and disability, with a focus on literature and theories relevant to reactions of the general public. From the literature it is apparent that many of the problems people with a visible difference have, such as low self-esteem, depression and shame, are in part directly related to the attitudes and behaviour of others (Kent and Thompson, 2003; Thompson and Kent, 2001). This could be either the reactions they evoke in others or the perception the person with the visible difference has of others reactions or attitudes. Much of the research conducted in the area looks at reactions from the perspective of the person with the visible difference, or observationally looks at how members of the general public react to someone with a visible difference (e.g., Rumsey, Bull, and Gahagan, 1982). This review emphasises the need to look at visible difference from the perspective of the perceiver to try to identify individual emotions and attitudes towards people with a visible difference. This information will allow interventions to be targeted more effectively. First, from the perspective of the person with a visible difference an understanding of why or how the responses they receive are elicited could help them to manage

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[1] The term 'visible difference' is used within this thesis rather than the more common term 'disfigurement', due to its negative focus (Rumsey and Harcourt, 2007). Evidently some visible differences may be covered with clothing; the term is intended to encompass those. It does not refer to conditions that otherwise fall under the umbrella of disability.

intrusive social situations and to normalise such reactions. Second, if attitudes are to be altered more generally (across the nation) then knowing if exposure to images of people with a visible difference (or increasing knowledge) may help, will enable specific targets to be employed. Finally, knowing in detail what these reactions are and what they might be caused and/or mediated by will help to inform community interventions.

Several theories account for reactions to people with a visible difference, but there are few empirical studies to support such theory. Chapter 2 discusses the theories that look at, potential emotional interactions and behaviour, naïve views of observers, and individual differences. Most of the theories related to individual differences can be seen to be associated with evolutionary theories; specifically appearance, disgust and shame. This thesis focuses upon the exploration of individual differences (or psychological variables) in responses to visible difference in terms of theoretical positions. In addition to individual differences, a second category is explored within this thesis, this is referred to as knowledge or experience[2]; whether the people themselves has had or currently has a visible difference, or whether they know someone with a visible difference.

From the review of the literature pertaining to visible difference, it is apparent that there is a need to explore reactions to visible difference (Thompson and Kent, 2001). This could be done in a number of ways; through qualitative interviews with people, observational or ethnographical studies, or through quantitative methodologies. For example, measuring responses using implicit, explicit and psychophysiological measures. The former methodologies have already been explored to some extent but relatively little research has investigated in depth automatic responses and the associated underlying psychological factors that actually account for reactions towards people with a visible difference. This thesis attempts to quantify attitudinal and psychophysiological responses to people with a visible difference, in order that a greater understanding of these processes can inform interventions. This thesis focuses specifically on skin conditions. It is important to look at a specific

[2] Within this thesis knowledge is the term used to refer to participants knowing someone with a skin condition or visible difference on a personal level, it does not refer to participants having knowledge (non-personal) about skin conditions (e.g., from a medical perspective). Similarly personal experience refers to participants that have had a skin condition or lived with a visible difference.

range of conditions, as there is some evidence that reactions may be condition specific (Deal, 2003). Secondly, skin conditions are a commonly occurring form of visible difference of which we know certain myths exist (Rumsey, Bishop and Shaw, 1997).

The main aim of this thesis is to assess the general population's immediate responses to pictorial stimuli of skin conditions, using measures of implicit and explicit attitudinal responses and emotional responses as measured by psychophysiology.

1.1 Attitudes

Chapter 3 looks in depth at attitudes, how they are formed and the difference between implicit and explicit attitudes (Greenwald and Nosek, 2001). Explicit attitudes are thought to be the product of all the information a person has available to them, but there is also a distinction between what they really think and what they report when asked. This can be altered consciously or without control depending on the context. Looking at implicit attitudes allows an underlying component of attitudes to be measured, often by looking at reaction times. Particular attention was given to the Implicit Association Test (IAT: Greenwald, McGhee, and Schwartz, 1998). This chapter also determines the necessity of measuring both forms of attitude. Explicit attitudes are what the individual is willing to report, and in some cases are better predictors of behaviour, as they may behave in a socially desirable way. Implicit attitudes give us an understanding of the attitude that is outside 'consciousness', this may enable an understanding of the underlying attitude to be established and how the two interact. The IAT has been used on a previous occasion (Grandfield, Thompson, and Turpin, 2005) to look at attitudes to skin conditions; this thesis aims to examine this methodology in greater depth and explore the role played by other psychological concepts.

1.2 Psychophysiology

Chapter 4 examines psychophysiology and the role it plays within attitudinal research and in determining emotional responses (Cacioppo and Sandman, 1981). Different methodologies are explored and three psychophysiological measurements are considered in detail. These are heart rate, electromyography (EMG) and the electrodermal response (EDR). Heart rate enables attention and valence to be detected in relation to specific images. EMG was utilised as valence effects are more specific and differentiation between emotions can be

ascertained. EDR is an indicator of affect. The experiments within this thesis, which employ psychophysiology, use all three measures. Within the EMG, three muscle sites, zygomaticus major, corrugator supercilii and levator labii were examined in order to allow differentiation between positive and negative affect, and to allow disgust to be distinguished from other negative emotional states.

1.3 Aims of this Thesis

The main aim of this thesis is to assess attitudinal responses to images of people with a visible difference caused by a dermatological condition. The studies within this thesis attempt to do so, using implicit and explicit methods to measure attitudes. A secondary aim of the thesis is to assess the emotional component of attitudes/reactions to skin conditions using measures of psychophysiology. The third aim is to see which psychological factors can account for, or have an effect on these reactions; in particular constructs related to the evolutionary theory, such as shame, appearance schema and disgust. In addition, this thesis aims to assess the effects of familiarity; knowledge and experience of skin conditions.

These aims are addressed through a series of four studies; the first study (Chapter 6) uses a sample of undergraduates, assessing their attitudes and emotional responses to images of people with clear skin and images of people with skin conditions. This is done using the IAT, psychophysiology, individual difference and explicit measures. The second study (Chapter 7) addresses a methodological issue within the IAT; since the initial study a personalised IAT was developed, which proposed to measure individual rather than societal attitudes. It was felt that the new measure may produce a more consistent response between knowledge effects and implicit attitudes. This study employed a two by two design to compare the new methodology with the traditional between participants who knew or did not know someone with a skin condition. The third study (Chapter 8) addressed another methodological issue within the IAT; earlier studies had found a gender effect but it was unclear whether this was a result of all the stimuli being female or whether there were genuine differences between males and females in their attitudes. Therefore, this study employed a two by two design using male and female IATs, these were compared across male and female participants. The final study (Chapter 9) followed a similar format to the initial study but there were two groups of participants, the first group were recruited from dermatology clinics (and are referred to within the thesis as the clinical group), and the second group were age and gender matched from the general population. This study was designed

to explore the differences in responses between populations. Full details of the methodology employed within this thesis can be found in Chapter 5.

Chapter 2: What do we Know About What it is Like to Live With a Visible Difference? A Review of the Literature

This chapter provides a review of the literature to date, examining the psychosocial impact of living with a visible difference. In particular, this review focuses on the effects of, or reactions to skin conditions. The chapter begins by ascertaining what a visible difference is, and then looking at the reactions that people with a visible difference may receive from members of the public. In this section, studies observing the public's behaviour are discussed to give an insight into the experiences of someone with a visible difference. The chapter then moves on to look at how skin conditions differ from other types of conditions that affect appearance. As attitudes are thought to develop in childhood, studies looking at preferences in children are also outlined here. Following this, reactions to different disabilities are explored because skin conditions vary in terms of their appearance (e.g., healed scars versus suppurating lesions) and how much they affect function and everyday life. Looking at how a visible difference fits with other forms of disability allowed an assessment of how grouping skin conditions may affect the overall results, and how representative skin conditions may be of the wider field of visible difference. The second half of the chapter looks at theories that have arisen to account for negative reactions toward people with a visible difference.

2.1 Search Strategy

References were collated via multiple methods: computerised searches using PubMed, Web of Science, Ingenta, PsychLit and Medline; e-mails or letters to authors of relevant work asking for additional unpublished material; searches of authors names; and references from articles and books. Sources were searched between 1950 and 2007. The search terms used were; Acne, Appearance, Attitudes, Birthmarks, Burns, Cancer, Cleft Palate, Dermatitis, Disability, Disfigurement, Eczema, Port Wine Stain, Psoriasis, Psychodermatology, Reactions, Reconstruction, Scars, Skin Conditions, Visible Difference and Vitiligo. Papers were excluded if they did not specifically look at the effects of, or reactions to a visible difference.

2.2 Nature, Cause and Epidemiology of Visible Differences

This section discusses what a visible difference is, the causes of a visible difference and the prevalence of visible differences. The more commonly used

term 'disfigurement', refers to an appearance that has been spoiled or is misshapen (UltraLingua, 1997), and often specifically refers to the face. Visible differences may be congenital or acquired; the former refers to problems such as cleft palate and birthmarks, and the latter to visible differences acquired later in life through disease, accident or medical procedures.

Occurrences of visible differences are not rare and every year in the United Kingdom 7,000 children are scarred by burns and 26,000 people are disfigured in road accidents alone (Trust and Trust, 2003). In the 1988 census, 250,000 people reported a severe visible difference affecting their face which adversely impinged on their ability to live a normal life (Office of Population Censuses and Surveys, 1988). Around 400,000 people have a minor visible difference (acne scarring, eczema, facial scars, birthmarks) (Lansdown, 1997). This equates to approximately one child with a visible difference in each primary school (Clarke, 1999).

In terms of skin conditions, over 20% of the UK population report the occurrence of a dermatological condition each year (Trust and Trust, 2003), of which, 2.3% have psoriasis (Cloote, 2000) and 4% vitiligo (Heason and Kent, 2001). Of school age children, 90% have acne, 20% of whom are moderately or severely affected (Kilkenny, Merlin, Plunkett, and Marks, 1998). In addition, 25% of 30-35 year olds continue to be affected by outbreaks of acne (Marks, Kilkenny, Plunkett, and Merlin, 1999).

2.2.1 Skin Conditions

As the focus of this thesis is skin conditions, this section pays particular attention to the skin. The skin is the largest and most visible organ in the human body (Saunders and Edwards, 2003) and is important to sense of self and to sexual attractiveness (Penzer and Finch, 2001). The influence of psychological factors is now well recognised (Papadopoulous and Walker, 2005). 'Healthy skin' has been defined as when the skin fulfils all of its functions in such a way that an individual's quality of life is not affected (Penzer and Finch, 2001). The skin usually renews itself every 28 days (Saunders and Edwards, 2003) but many skin conditions are caused by interruptions to this process. For example, psoriasis occurs when the process is sped up resulting in the overdevelopment of skin cells. Conversely, when skin renewal is slowed down, people may develop leg ulcers and/or less protection to ultraviolet light (Cloote, 2000). Eczema is a result of abnormalities in the cell walls, which lead to the skin becoming more porous and less able to retain water (Peters, 1999). Acne is caused by bacteria that live naturally on the skin, which use a natural by-

product (sebum) of the sebaceous glands (follicles) for growth. White blood cells are drawn to the follicles to fight the bacteria, beginning the acne cycle. Acne is more likely when there is a genetic predisposition and when sebum production is increased by hormonal fluctuations (Brannon, 2006). As highlighted here, there are many different causes of skin conditions. Whilst, there are many treatments available and some can be effective; many treatments merely reduce severity or offer temporary relief (APPG, 2002; Papadopoulos, Bor, and Legg, 1999) as opposed to eradication of the problem.

Individuals with a skin condition may be adversely affected both physiologically and emotionally (Neil, 2001). Physiologically they may experience pain, itchiness and discomfort, which may result in less physical contact. Hautmann and Panconesi (1997) comment that the skin is important to the development of the body, self and mental self because of its tactile function. Research shows that touch can reduce the amount of stress hormones (Cassidy, 2000; Gilbert and Miles, 2000), which in turn can improve coping and positive health behaviours. Therefore, a reduction in physical contact for people with a skin condition may also impact upon their psychological and emotional well-being.

2.3 Impact of a Visible Difference

For many people with a visible difference, there are additional factors that affect their coping abilities. Visible differences caused by accidents, such as a car crash, may have associated psychological challenges such as depression, anxiety and post traumatic stress disorder (PTSD, Thompson and Kent, 2001; Van Loey, 2003). Visible differences associated with diseases such as cancer may be coupled with concerns about life expectancy, the return or worsening of the disease and the pain associated with it (Lansdown, 1997). Problems, such as burns or skin conditions can also require considerable daily attention; applying creams, bandages and associated general care, possibly leading to concerns about long-term effects, such as scarring. There is considerable variation in coping amongst individuals, however this does not seem to differ according to gender, age, social class, cultural background or the severity or coverage of the visible difference (Thompson and Kent, 2001).

2.3.1 The Psychological Impact of Visible Differences

Individuals with a visible difference often report high levels of psychological distress and difficulty (Scharloo et al., 2000). They are more likely than unaffected people to report depression (Lawrence, Fauerbach, and Thombs, 2006; Papadopoulos et al., 1999; Van Loey and Van Song, 2003), low self-

esteem, relationship difficulties (including females feeling less attractive to men) (Bentovim and Walker, 1995; Papadopoulos et al., 1999), psychosocial difficulties (Rumsey et al., 2004), and are more likely to experience social anxiety (Berk, Cooper, Liu, and Marazita, 2001) and social self consciousness (Tebble, Adams, Thomas, and Price, 2006). These psychological feelings are not just restricted to adults; young people also report considerable distress (Lovegrove and Rumsey, 2005). Indeed, Newell and Marks (2000a) compared people who were psychologically distressed due to a visible difference affecting their face with people who had social anxiety or agoraphobia. Participants were tested on scales measuring depression, anxiety, fear and agoraphobia; people with a visible difference affecting their face resembled those with social anxiety on the fear questionnaire, and those with agoraphobia on the anxiety and depression scales. Comparisons of people with social anxiety and agoraphobia allow some understanding of the extent of the psychological distress felt by people with a visible difference.

Very few studies have found a relationship between the clinical severity of the visible difference and the degree of distress, though there are exceptions. Tebble, Thomas, and Price (2004) found that the size of the scar in facial lacerations was related to self-consciousness.

There are many factors that could be implicated in the psychological impact of skin conditions; there is evidence to suggest that a facial visible difference acquired during adolescence has a greater impact on longer-term adjustment when compared with visible differences occurring from birth or beginning in adulthood (Bentovim and Walker, 1995). Studies assessing the effects of psoriasis found that there was a greater negative impact on the patient's life when the condition affected visible areas such as the face and hands (e.g., Kent and Keohane, 2001; Picardi et al., 2001). Fortune (2000) supported this observation, noting that people with psoriasis had high levels of worrying thoughts, but these were mostly linked to personal and social evaluation than to their disease or symptoms. Moss (2004) suggested that coping may be related to compartmentalisation of appearance. Other studies have found that females are more affected than males (Kellett and Gilbert, 2001). Personal reflections of people with a visible difference (Lansdown, 1997) indicate that the reactions and degree of support offered by parents may be a protective factor. Additional factors linked with coping involve the location of the condition. Areas of the face used in conversation such as the nose, mouth and eyes rather than periphery features may have a greater impact on the individual and the reactions they receive from others (Robinson, 1997). The appearance of the visible difference,

such as its colour, shape and texture; the degree of irritation (itching, pain, discomfort) and the impact on everyday life (Clarke, 1999); whether patients rather than consultants rate the visible difference and the amount of hospital treatment and management required (Robinson, 1997; Terwee et al., 2003) may all have an effect. Some studies indicate that women report higher anxiety than men (Dion, Walster, and Berschei, 1972), whilst other studies have not found gender effects (Porter, Beuf, Lerner, and Nordlund, 1987; Tebble et al., 2004), this may be related to the type of visible difference.

Not all people with a visible difference experience psychological distress; studies addressing specific problems have found positive adjustment in people with burn injuries and port wine stains (Blakeney, Portman, and Rutan, 1990; Kalick, Goldwyn and Noe, 1981). There is also evidence to suggest that having a disability may have a protective effect for the individual. Bentovim (1995) looked at the body-related attitudes of groups of women with diabetes, rheumatoid arthritis, skin conditions (mainly eczema) and visible blood vessel deformities. These women worried less about small changes in their weight and shape than did comparable women without disabilities. This could be because their illness had higher salience for them, but if this improved then they may spend extra time worrying about other aspects of their appearance.

2.3.1.1 The Psychological Impact of Skin Conditions

This section looks specifically at skin conditions and the psychological impact they may have. Many of the features (e.g., anxiety, depression), are the same as those felt by people with other visible differences but they may be felt for different reasons. In addition, skin conditions have components that are different to many other visible differences, such as the possibility that they may clear up and that they may affect a much wider proportion of the population.

Emotionally people with a skin condition may experience heightened anxiety (APPG, 2002; Kellett and Gawkrodger, 1999; Kent and Thompson, 2003; Picardi et al., 2004; Rumsey et al., 2004), depressed mood (Gupta, Schork, Gupta, Kirkby, and Ellis, 1993; Kent and Thompson, 2003; Picardi et al., 2004; Rumsey et al., 2004), suicidal thoughts (Gupta et al., 1993), low self confidence (Kent, 2003; Kent and Thompson, 2003; Thompson, 2005; Thompson and Kent, 2001), embarrassment, self consciousness (Marks et al., 1999), avoidance of social situations (Jowett and Ryan, 1985; Rumsey et al., 2004), difficulty forming relationships, (Lannigan and Cotterill, 1989) lower quality of life (Rumsey et al., 2004), and possess negative beliefs about their appearance (Papadopoulos et al., 1999). Up to 7% of children and adolescents are believed

to avoid social activities as a result of skin conditions (Ramsay and O'Reagan, 1988) and teenagers report higher levels of emotional and behavioural difficulties (Smithard, Glazebrook, and Williams, 2001). The variable nature of some skin conditions can make adjustment particularly hard. Some people with a skin condition may have periods when their skin is complaint free while others have conditions that move from one area of the body to another, and therefore, any improvements cannot be assumed permanent (Papadopoulos et al., 1999). People with little or no improvement to their skin condition may have difficulty psychologically adjusting to their appearance because they hope that the condition will eventually clear up (Papadopoulos et al., 1999, Hawkesworth, 2001). In addition to these factors, there is the concern that even if the condition does improve, there will be a permanent visible difference resulting from the scarring (Thielitz and Gollnick, 2005).

Clinically, there is a body of evidence suggesting that stress and life events may actually affect the severity, longevity and onset of some skin conditions (Kellett and Gilbert, 2001; Papadopoulos, 1998; Papadopoulos et al., 1999; Scharloo et al., 2000). However, a review and subsequent research suggest this should be explored more vigorously. Picardi and Abeni (2001) reviewed the literature looking at the relationship between stress and the onset of skin conditions, and found that few studies had looked at this in a methodical way and controlled for confounding factors. They also found studies, which suggested there was not a link between stress and life events and the severity, longevity and onset of skin conditions. In their own research they looked for a link between stress and two common skin complaints; vitiligo and psoriasis (Picardi, Pasquini, Cattaruzza, Gaetano, Baliva et al., 2003; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi et al., 2003). A modulated link between stress and the course of vitiligo (but not onset or severity) was found, but no significant link between stress and psoriasis was identified. This is an area important to study further, as skin conditions themselves can be a cause of stress, so the process could result in a vicious circle (Kendall and Hamman, 1992, cited in Saunders and Edwards, 2003). High anxiety is also one of the main factors attributed to non-adherence with medications and treatments of skin conditions (Linnet and Jemec, 2001). Thus, reducing stress and anxiety levels may improve medication adherence and consequently the long-term outcome of skin conditions. Despite the above research describing the effect of skin conditions on individuals, dermatologists can underestimate the psychological consequences. Sampogna, Picardi, Melchi, Pasquini, and Abeni (2003) compared dermatologists' and patients opinions about the impact of a skin condition on the patient's life. Although there

was good concordance between the two, dermatologists generally believed the psychological consequences of skin conditions were less frequent and severe than reported by people with a skin condition.

The literature has tended to refer to skin conditions as a collective. Few studies address the effects of living with a specific skin condition and even fewer compare different groups. It is important to remember that there are very different factors associated with different conditions. For example, vitiligo is pain free, it is a permanent appearance-altering condition that can greatly challenge the individuals self-esteem (Heason and Kent, 2001; Thompson et al., 2002). On the other hand, psoriasis often has a great deal of pain, itchiness and treatment associated with it that may be time-consuming and constantly intrusive for the patient. This may have less psychological impact in terms of appearance (Kellett and Gawkrodger, 1999) but greater distress due to discomfort.

2.4 The Social Impact of Visible Differences

As mentioned above, much of the psychological distress experienced by someone with a visible difference can be attributed to the reactions of others, whether real or perceived. This section looks at the social impact of visible difference in more depth; looking at what the person with a visible difference experiences, the reactions that have been observed (through research), reactions that are specifically related to skin conditions and how children react to visible difference. This section concludes with a brief overview of reactions to disabilities in general, as this literature has often compared physical disabilities with visible differences, and because this body of literature is much larger and there may be similarities within the themes.

2.4.1 Experience of Reactions of Others

The literature presented above demonstrates that people with a visible difference consistently report increased concerns and lower quality of life than people without a visible difference, and the majority of their problems appear to stem from their difficulties in social interactions and meeting new people (Porter, Beuf, Lerner, and Norlund, 1990), feelings of difference from the norms of society, (Thompson et al., 2002) and their experiences of stigma (Bull and David, 1986; Heason and Kent, 2001) and negativity (Kent, 2000) within their social interactions (Clarke, 1999).

In the past it was thought that people blame their failures unrealistically on their

visible difference (Knorr, Edgerton, and Hoopes, 1967). Today it is accepted that there is an interaction between the individual and external factors. Charities such as Changing Faces are keen to raise awareness of the social impact of living with a visible difference and they point out that this is as much about society as people with a visible difference themselves. Supporting the influence of external factors are studies describing self reports of staring and comments from the public, (Newell and Clarke, 2000; Thompson and Kent, 2001; Thompson et al., 2002) as well as observational studies (e.g., Rumsey et al., 1982), these reactions will be covered in greater depth later in this chapter (2.4.2).

There is also a body of evidence, which suggests that even the thought of having a visible difference can change how the individual views the world. Strenta and Kleck (1985) made up actors to look visibly different but then removed the visible difference without telling them (they did not look in a mirror). The actors reported stronger reactions from the public than a matched group of actors without a visible difference. The possible reasons for this could be a misperception of others behaviour, or subtle changes in their own behaviour, which in turn affects responses to them. Snyder, Tanke and Berscheid (1977) argue that being preoccupied with appearance may cause individuals to behave defensively. An alternative view, is that people internalise their perception of their appearance into their self-concept, which then drives their behaviour and influences how they process information from their social environment. So the view they have of themselves can affect how they think other people see them, this in turn affects their behaviour towards others, which can then affect their behaviour (Altabe and Thompson, 1996). Beuf (1999, cited in Heason and Kent, 2001) felt that people with a visible difference may internalise others' attitudes. So if the person with a visible difference perceives an attitude to be negative and adds this to their self-schema then they are more likely to be selective in their interpretation of later situations and focus on information that supports a negative perception of themselves (Kenny and Depaulo, 1993). Indeed Pope and Ward (1997) found that self-perception was one of the most important factors in adjustment to a visible difference. A positive perception of appearance was found to be positively correlated with global self-worth, self-perceived social acceptance, and number of same-sex close friends, whereas it correlated negatively with loneliness, parent-rated social problems, and parental advice/support and concern.

2.4.2 Observed Behaviours and Reactions Towards Visible Differences

So far, this chapter has looked at the effects of having a visible difference on a person's emotional or psychological well-being and their experience of perceived reactions from others. A number of studies have also been conducted which examine the public's *actual* reactions to people with a visible difference.

Rumsey et al. (1982) conducted an observational study comparing the reactions of the general public to two groups of actors: one groups were given artificial birthmarks, scars or bruising and the other group were used as a control. Rumsey and colleagues observed that members of the public actively stood further away from the actors with a visible difference than those without. Furthermore, it was noticed that members of the public tended to stand to the side of the actor where the visible difference was less prominent, if possible. In a similar study, Snyder and Endelman (1979) asked participants to choose whether they wanted to sit next to someone with a disability or an able bodied person to watch a film and found that all of the participants opted to sit with the person with a disability. However when the two people were viewing different films, the participants opted to sit next to the able-bodied person, citing film choice as a factor. So when given a feasible excuse they chose to sit next to a non-disabled person.

People interacting with individuals with disabilities show anxiety and discomfort (Kleck et al., 1968) and also gaze at them longer. Such behaviour could be seen as a sign of threat by people with a visible difference (Sigelman, Adams, Meeks, and Purcell, 1986) however it may be a sign of novelty or curiosity (Langer, Fiske, Taylor, and Chanowitz, 1976). Care should therefore be taken when considering the design and interpretation of this kind of research, as participants may act in socially appropriate ways or their actions could be misconstrued.

Soble and Strickla (1974) found that people with hunchbacks were less successful in persuading members of the public (approached door to door) to take part in an interview on a topic unrelated to visible differences. However if the person with the hunchback made it clear to the occupier that they would be interviewed by a different person at another time they were more likely to agree to participate. It is possible that this indicates that part of the problem may be associated with spending a prolonged period of time with the person. Piliavin, Piliavin and Rodin (1975) found that if a blind person on a train fell over they were helped 61% of the time if they had a port wine stain and 75% of the time if

they did not. It also took longer to initiate help when they had a port wine stain on their face. The help response times stated in the study were in excess of 20 seconds and it is unclear what the person lying on the floor was doing during this period, this may therefore add a secondary factor for consideration. Other studies demonstrate that people with a facial visible difference experience less helpful behaviour, (Samerotte and Harris, 1976) receive less charitable behaviour from people (Bull, Rumsey, and Stevens, 1981) and receive less sympathy as victims of crime (Kerr, Bull, MacCoun and Rathborn, 1985) to cite just a few examples.

2.4.2.1 Reactions Unique to Skin Conditions

There are factors unique to skin conditions, which are not apparent in other visible differences. Earlier, it was described how the transient nature of skin conditions can make adjustment difficult. Other factors that affect adjustment are the attitudes of the public, both with respect to their comments and staring, and also with regard to the lack of knowledge they have about skin conditions.

Acne is one of the conditions associated with the greatest lack of understanding, perhaps because it is very common within teenagers and may have cultivated many myths over the years. Some of the problems experienced by older people with acne revolve around the condition being seen as a teenage problem and something they should grow out of (Murray and Rhodes, 2005). However, misconceptions surrounding acne are widespread. Alderman (1989) cited some associated myths, including lack of dietary control, lack of hygiene and even low IQ. Smithard, Glazebrook and Williams (2001) found that, in general, teenagers had very poor understanding of the causes of acne and that this did not differ between teenagers who had had acne or those that had not. This is unsurprising when you consider studies such as Green and Sinclair (2001). They looked at the exam papers of 215 final year medical students. Within the exam paper was a question asking the students what they felt were causal factors for acne; 41% blamed diet and 25% hygiene despite neither of these factors being associated (Kenyon, 1966; Rasmussen and Smith, 1983). This is also true of the beliefs of patients with acne; 32% of patients believe diet to be a causal factor (Rasmussen and Smith, 1983). Common misconceptions such as these mean that the person is perceived to be, in part, responsible for their condition and as a result may receive increased negativity towards them from others (Kenyon, 1966; Rasmussen and Smith, 1983).

Another factor associated with skin problems is the assumption that the condition may be contagious (Watts, 1999). Chickenpox for example is

experienced by many children and they are warned of the chances of passing on the infection. Whilst it is not a skin disease per se, one of the most visible effects is on the skin. Lynn, Lawton, Newham, Cox, Williams and Emerson (1997) found that many children with skin conditions were being banned from swimming after erroneous concerns about infection and contagion. Therefore, people with skin conditions may experience negativity towards them from others due to a belief that contact could result in a risk of infection.

2.4.3 Children's Reactions to Visible Differences

The development of attitudes towards visible difference may partly occur as a consequence of children internalising prevalent stereotypes (Kent, 2002; Kent and Thompson, 2003; Rumsey and Harcourt, 2007). Younger children appear less negative to peers with physical differences than older children, and girls are generally more positive than boys (Harper, 1995). Girls however, are more negative towards facial visible difference and obesity than boys are. It is interesting that these are both intrinsically related to appearance. In Harper's (1995) study, children were asked which child they would most like to play with (a child in a wheelchair, a child on crutches, a child with a cleft palate and a child who was obese). Analysis of the children's comments revealed concerns that the child with the facial visible difference would not be able to communicate so well. One child who was in a wheelchair rated the child with the cleft palate highest because they could still push him, therefore they could overcome the fact that the child could not walk. It seems that for children, function may be an important factor (i.e., how well can the child with the disability play with them). Also children as young as eight said "children like that" (referring to the child with cleft palate) are often more quiet, suggesting they have insight into how a visible difference affects the child. Other studies with children have also found those with facial visible differences to be ranked lower than those with other disabilities (Giancoli and Neimeyer, 1983; Harper and Peterson, 2000). Rumsey, Bull and Gahagan (1986) asked children to pick the picture they preferred from sets of two, one in which the person portrayed was about to undergo surgery and one in which they had had corrective surgery. Younger children selected the after surgery pictures at about chance level, whereas older children chose the after picture about 90% of the time. This suggests that younger children have less preference for 'perfections'. It may also be that the older children may have known what was being measured and tried to answer 'correctly'.

These studies indicate that prejudice develops as children get older and that for

younger children function is an important factor in how they react to people with a visible difference. Richardson (1971) discusses the importance of previous contact with disabilities and the attitudes of the child's family members in the formation of attitudes. The research cited did not account for this component. Although these studies have found preferences, these varied across the studies and it is not clear on what criteria they are based, since children showed preferences for different reasons. Harper (1995) found that children seemed to be concerned with function, but the other studies did not look at the reasons behind the preferences. Future studies could pay closer attention to what the reasons are as they may be fundamental to the understanding of the development of negative attitudes.

2.4.4 Differences in Reactions Across Disabilities

The literature looking at visible differences has either looked at specific conditions (e.g., cleft palate) or looked at the area of visible difference as a whole (by grouping them together). Comparisons between groups are covered in greater depth within the disability literature, and often, disabilities are compared to visible differences affecting the face. Therefore, this section looks at reactions to disabilities, in order to build an understanding of the factors that may be salient in attitudes and to make hypotheses about the extent reactions to skin conditions will be generalisable to other forms of visible difference.

It is unclear whether attitudes to one form of disability differ significantly from those toward another. Esses and Beaufoy (1994) explored attitudes to AIDS, amputation and depression. Overall, they found that stereotypes, symbolic beliefs and control over the occurrence of disability affected the negativity associated with it. In particular, higher perceived control was associated with greater negativity. In addition, cognitive determinants and the emotion elicited by the group members had an effect. If cognitively it appears that the person with the disability is not at fault then they were likely to receive more sympathy. Emotionally, the degree of disability and its impact on everyday functioning also influenced the response received. Different factors were salient for each group. For example, the group with AIDS highlighted sorrow, in contrast, depression was thought to be more controllable, and so fewer people were sympathetic towards them. When participants were given context to put the people in perspective (e.g., this person is depressed due to hormonal fluctuations following childbirth) their initial opinions were more favourable. Harasymiw, Horne and Lewis (1976) found a hierarchy of type of disability, where physical disabilities were perceived the most favourably, followed by sensory disabilities

(such as blindness or deafness), and finally social disabilities (such as depression).

A study exploring the attitudes of people with a disability to other disability groups found a preference for own disability group (Mastro, Burton, Rosendahl, and Sherrill, 1996). However, it is possible that this is due to a sense of familiarity and understanding, rather than negativity towards other groups. Overall, the hierarchy of preference for the different groups was similar to that expressed by non-disabled people. In fact, Deal's (2003) research into disabled peoples' perceptions of other disability groups found that when people with varying disabilities are in a group with non-disabled people, they have a sense of shared identity and tend to group together. When people with disabilities are on their own in a group (no non-disabled people present), they have a tendency to split into sub-groups possibly because they feel that they can identify better with people more similar to themselves. This is supported by the fact that sometimes they also split in terms of race or other criteria, showing that they have more than one identity.

Attitudes are also associated with duration of disability, likelihood of improvement (Weiserbs and Gottlieb, 2000), visibility (Falvo, Allen, and Maki, 1982; Lazarsfeld, 1972, cited in Gething, 1991), how normal the person with a disability looks (Chapkis, 1967 cited in Gillespie-Sells and Davies, 1996) and impact to health (Lazarsfeld, 1972). Stevenage and Mckay (1999), found that people with a port wine stain on their face were less likely to get a job than a wheelchair user. Janickie (1970, cited in Gething, 1991) asked health professionals how disturbing they found disabilities, they rated less function-impairing ones, such as visible difference, more highly. However, it may be that health professionals' unique training focuses their attention towards functionality. Other studies show variations according to who is questioned. English (1971) found that age and sex of perceiver affected attitudes, with younger women more likely to be negative. All of the studies above suggest different components that are considered worse and different ways of rating people at different times, therefore attitudes may be context specific. For example, the health professionals thought in terms of functionality, so perhaps the other studies force people by their nature to think in terms of context. Grouping someone with AIDS with an amputee and someone with depression may force people to think in terms of causation, therefore it could be that other studies have produced bias in a similar manner.

Yuker, Block and Campbell (1960, cited in Gething, 1991) point out that whilst

there are differences across conditions, there is also considerable overlap. Similarly, Gething (1991) argues that attitudes are stable across different forms of disability and that the biggest contributor to differing attitudes is level of prior contact with disability. Gething's research shows no differences in attitudes according to the visibility of the condition. However, as participants were only asked their opinion of different *groups* of disability and visible difference, it is feasible the results would be different if pictures or videos had been presented. It is possible that level of prior contact also affects familiarity: greater prior contact would indicate greater knowledge of that group and it would be easier to form an opinion. In support of this, Yuker, Block and Campbell's overall results show a gradual rise in level of discomfort with decreased contact but this drops in the group, where the least contact has occurred.

2.4.5 Psychosocial Interventions

Psychological difficulty, particularly in social situations, is widely reported by people with a visible difference, but many have no access to formal psychological treatment (Newell and Marks, 2000b). However, treatments to improve coping are gradually being implemented (Bessell and Moss, 2007) and at the moment involve; social skills training, which helps people with a visible difference to cope better in social situations and to handle the comments they receive from others; cognitive behavioural therapy (CBT) which focuses on the individuals thoughts and beliefs; or community interventions, which are designed to change stereotypes or behaviours towards people (Thompson and Kent, 2001; Bessell and Moss, 2007).

So far the outlook for the treatments is very positive; social skills training has been shown to lower anxiety for at least six months post treatment (Robinson, Rumsey, and Partridge, 1996) and is a better predictor of mental health than the severity of the visible difference (Clarke and Bradbury, 1996). Rumsey et al. (1986) found that people with a visible difference could improve the impression others had of them through the use of social skills. A study by Lovegrove (2005) found that social skills training to cope with bullying may reduce all teasing. Individuals who used social skills more frequently appeared able to override the effect of having a visible difference. CBT has been particularly effective for people concerned about or disturbed by their appearance (Cash and Janda, 1977). Cash used an eight-step program where patients assessed their appearance, reflected, learnt relaxation techniques and desensitisation techniques, identified and adjusted assumptions, addressed negative self talk and addressed behaviours relevant to their body image. Extremely positive

results were observed in terms of improved self-esteem and scores on an appearance scale (Cash and Hicks, 1990). Newell and Clarke (2000) gave people a self help leaflet with cognitive behavioural strategies and found it effective at reducing anxiety and depression, it also raised involvement in social leisure activities. Papadopoulos, Bor and Legg (1999) gave an eight week course of CBT to patients with vitiligo; in comparison to a control group they had improved self-esteem and quality of life immediately after therapy and at five month follow up. There was also some evidence that progression of the disease may have slowed. Similarly, in patients with psoriasis, Fortune, Richards, Kirby, Bowcock, Main and Griffiths (2002) found group CBT reduced anxiety, depression, psoriasis-induced stress and clinical severity.

There have been very few community interventions; one study (Cline, Proto, Raval, and DiPaolo, 1998) incorporated a theme about visible difference into a schools curriculum. They found that the children's knowledge and awareness of disfiguring conditions increased compared to a control school, but there was no difference in children's commitment to help others with a visible difference. Changing Faces (2007) aim to alter the public's perceptions of visible difference through various interventions; including increased media coverage, increased education in schools and workplaces, and through posters displayed nationally. They also run workshops and groups to develop social skills on the premise that people with a visible difference have to deal with intrusive negative comments.

Also implemented are physical interventions, in the form of skin camouflage services. These have had beneficial effects on well-being, reducing social avoidance (Kent, 2002) and increasing quality of life (Holme, Beattie, and Fleming, 2002), particularly in patients with lower quality of life initially (Ongenae, Dierckxsens, Brochez, van Geel, and Naeyaert, 2005). Though the ability of such interventions to change underlying psychological vulnerability has been questioned (Kent, 2002).

Unfortunately, most of these studies stand alone, they have not been replicated, and have not used control groups, therefore the true effectiveness cannot be assessed at the current time.

2.5 THEORIES ACCOUNTING FOR THE IMPACT OF REACTIONS OF OTHER PEOPLE TOWARDS VISIBLE DIFFERENCE

There are several theories that account for why people with a visible difference may feel distressed. This section focuses on outlining these theories.

2.5.1 SELF DISCREPANCY THEORY

It has been suggested (Thompson, 2005) that self discrepancy theory (Higgins, 1987; Moss and Carr, 2004), may help to explain why people with a visible difference cope in different ways. They postulate that the self-concept consists of three perceptions: actual, ideal, and ought selves, and that discrepancies between these components may be related to specific emotions. In terms of attitudinal responses to others, it could be that people with large discrepancies are most likely to be sensitive to and critical of others appearance (see 2.5.3 for a more in depth look at attractiveness).

2.5.2 STIGMATISATION THEORY

Goffman (1968) described stigma as when members of a society internalise a common set of beliefs that define normal and deviant, and as a result, the deviant members of society are stigmatised or marked out as different. Markers tend to refer to social marks that are undesirable such as physical disability, mental illness, race or religion. Wright (1983) stated that anything that deviates from cultural norms stands out and is perceived in a negative way. This is supported by Jones, Farina, Hastorf, Marcus, Miller and Scott (1984) observation that visibility concealability is important and that the more visible a difference the more stigmatised it is likely to be, this is endorsed by later studies (e.g., McGrouther, 1997). 'Deviance' is socially defined, something that could be considered 'normal' within one culture could be considered 'deviant' within another. One example of this is the shift in attitudes towards weight across cultures. Some cultures prefer slender women whereas others prefer rotund women. James Partridge (survivor of severe burns, and founder of 'Changing Faces') observed that whilst in India no one seemed to notice his burns, whereas in the UK he continuously stood out as different (Partridge, 1990). An alternative explanation could be that visible differences are more common place in India (e.g., there has been a higher rate of disfiguring diseases such as leprosy; Rao and Lakshmi, 2005). There is also evidence that visible differences in women in India are extremely stigmatising (acid burn attacks; e.g., Shahidul and Mahmud, 2001).

Different forms of stigma produce distinct responses (Heatherton, Kleck, Hebel, and Hull, 2000). Albrecht, Walker and Levy (1982) noted that there were differences between physical disabilities and disabilities such as mental illness, which are associated with an element of control. Weiner, Perry and Magnusson (1988) stated that physically based stigmas where the onset was uncontrollable were linked to pity and plans to help, whereas mental and behavioural problems

were seen as controllable at onset resulting in people being less likely to help them and occasionally reacting with anger. They found though, that by giving people information about mental illness, this could change their attributions and feelings. This literature has close links to the findings regarding disability described earlier (2.4.4). Disabilities were perceived differently depending on how the disability was thought to have occurred, the degree of control they thought the person with the disability had over it, and the severity of the disability.

However, there is a distinction between felt and enacted stigma (Heatherton et al., 2000). Jacobi and Cash (1994) found when he questioned people with epilepsy, 32% felt stigmatised whereas only 2% had experienced explicit stigmatisation. This could be partly attributable to the form stigmatisation takes: body language can be much more difficult to perceive than verbal language but still picked up subconsciously.

2.5.3 SHAME

Shame is considered an underlying aspect to how people feel about themselves. In terms of visible difference, shame has been argued to be a key component in how sufferers of visible difference view their body (Kent and Thompson, 2003; Thompson and Kent, 2001). Shame refers to a conscious or unconscious sense of negative self-appraisal regarding ones feelings towards themselves or how they perceive others to see them (Goss, Gilbert, and Allan, 1994). Indeed Tangney, Wagner and Gramzow (1992), define shame as affecting feelings about the whole self. Understanding of the term shame was developed by Jacobson (1964, cited in Pfeiffer, 2000), who noticed that visibly different patients frequently experienced shame reactions and feelings of inferiority. She suggested that shame was a result of patients' feeling out of control and failing in their aspirations. Kingston (1983, cited in Pfeiffer, 2000) looked at the reasons underlying shame and saw shame as being caused by a need to fulfil parental expectations conflicting with the individual's identity; as a result the individual feels alone and isolated rather than part of a unit; this creates conflict within oneself.

According to Gilbert (1998), shame is an involuntary response to awareness that a position of social status has been lost. Shame results in submissive behaviours, gaze avoidance and withdrawal. These behaviours may be protective, indicating that an attack or rejection from other members of the group are not necessary and also to appease others in the social hierarchy (Gilbert and Miles, 2000). Shame can also act as an internal warning of threats

and challenges to the self, triggering automatic defences such as 'flight' (preparing to escape), submission (Keltner and Harker, 1998), concealment (MacDonald and Morley, 2001), and even anger (Tangney, 1996).

Shame can be an internal or external experience. Internal shame is related to a persons cognitions of themselves as unacceptable or bad and may relate to body image, personal characteristics or behaviours (Gilbert and Miles, 2000). Internal shame can be measured by asking people to evaluate themselves, if they have high internal shame then their evaluation will be negative and they often feel disgust for themselves or their actions. External shame refers to how a person believes other people perceive them (Goss et al., 1994), they realise that one's characteristics have the potential to elicit shame in others. This is subjective and therefore other people may not see them in the way they envisage. External shame also requires theory of mind (an understanding that other people have different beliefs, desires and intentions to themselves) as it requires the individual to consider what others may be thinking. There is a high correlation between internal and external shame, though they do not necessarily co-occur, for example someone with a visible difference may feel that they elicit disgust in others but not feel the same emotion towards themselves. Lewis (1971) does not distinguish between the two; she acknowledges shame as a disapproving internalised element of self. She considers external shame to be related to stigma, in that the individual feels stigmatised by their actions, or characteristics.

Rank or status in western society is often related to factors such as academic ability, intelligence, wealth or appearance. Advantages are gained by creating a positive impression in others (Boehm, 1999), and create positive affect and physiological regulation in the individual (Cacioppo, Tassinary, and Berntson, 2000). Having a visible difference can mark someone out as different and thus lower their perceived social rank (Gilbert and Miles, 2000). If an individual perceives themselves as unattractive or fears negative evaluation, this may cause negative affect and lead to feelings of shame (Gilbert and Miles, 2002; Thompson et al., 2002). Gilbert (1989; 1997) posits that humans have evaluative abilities to enable them to track how attractive they are to others through their social attention holding power (SAHP). External SAHP refers to how much attention the person gets from others and internal SAHP refers to the persons own attention to themselves such as feelings of pride or shame. Perceiving high external SAHP may improve the individuals self-esteem (Leary, Koch, and Hechenbleikner, 2001), whereas low SAHP can cause feelings of subordination, exclusion and shame (Gilbert, 1998; Gilbert and Miles, 2002)

2.5.4 ATTRACTIVENESS

Physical attractiveness is valued in our society (David and Barritt, 1982; Rumsey and Harcourt, 2005).Typically, people with a visible difference are considered to be less attractive than people without a visible difference (Heason and Kent, 2001; Chapter 3). On the opposite spectrum to the studies outlined, people perceived as "beautiful" are considered good (Heason and Kent, 2001), attractive people are considered more socially desirable and successful (Dion et al., 1972), and the attractiveness of a witness affects jury outcome (Kerr et al., 1985). Attractive people have more favourable treatment in hiring and promotion (Dipboye, Arvey, and Terpstra, 1977), are rated as smarter and more socially skilled (Dion et al., 1972), are considered more socially competent, intelligent, dominant, and better adjusted (Eagly, Ashmore, Makhijani, and Longo, 1991) and are expected to be warm, kind and sensitive (Rumsey et al, 1997). Attractive babies also receive more attention (Langlois, Ritter, Casey, and Sawin, 1995). Similarly, Bull and Brooking (1985) found that marriage to an attractive partner increases the perceived attractiveness of a person with a visible difference. This could be because the attractiveness of one partner raises the perceived attractiveness of the other partner. Alternatively, it could be because the raters perceived the married partners as happier and this had an effect on their rating. Interestingly, attractive people are not considered better parents (Fiengold, 1992). Heason and Kent (2001) suggest that this may be because there is an understanding that attractive people are received better socially, but that internally their attributes are the same.

2.6 THEORIES ACCOUNTING FOR NEGATIVE ATTITUDES TOWARD PEOPLE WITH A VISIBLE DIFFERENCE

The development of negative attitudes toward visible differences has been a subject of much debate. The key theories described in the literature are the just world hypothesis, the SCARED model, stigmatisation and evolutionary theories, which include, disgust, attractiveness and shame.

2.6.1 THE SCARED MODEL

Increasingly, researchers are trying to understand the factors underlying the public's reaction to visible difference. The SCARED model (Figure 2-I, Partridge (1996)) was developed to explain people's reactions through the feelings visible differences can elicit.

Figure 2-I: Partridge's SCARED Model

FEELING		BEHAVIOUR
Sorry, Shocked	**S**	Staring, Speechless
Curious, Confused	**C**	Clumsy
Anxious	**A**	Asking, Awkward
Repelled	**R**	Recoiling, Rude
Embarrassed	**E**	Evasive
Distressed	**D**	Distracted

According to the model, feelings of embarrassment trigger evasive behaviour, whereas feelings of sympathy are linked with people staring or speechlessness. Essentially the model focuses on capturing responses and thus understanding reactions. This is a theme that is central to much of Partridge's (1996) work; where attitudes are seen as uncertain rather than hostile, and the persons own behaviour is influential in determining the responses from others. In an interview with Austin (1999), Rumsey supports this view; she commented that she felt reactions to scars were partly fear, revulsion and excitement. Bull and Rumsey (1981) felt that reactions were likely to be an aversion but also sympathy and curiosity. These types of reactions were also mentioned earlier in the chapter (2.4.4) with respect to the public reacting to different forms of stigmatising conditions in different ways depending on causal, control and other factors.

2.6.2 JUST WORLD HYPOTHESIS

The just world hypothesis (Lerner 1980, cited in Hahighat, 2001) proposes that experiencing bad things without being responsible, threatens our sense of safety, so we need reassurance that it would not happen to us. Therefore, we decide that the stigmatised have done something wrong and are being punished, for example, addiction is self-inflicted. This also follows early theories regarding the function of religion, for example 'suffering' in this world ready for better things in the next world. This is also referred to as the model of primitive beliefs (Shaw, 1981) which concentrates on explanations of visible differences that have no scientific basis but may be believed by proportions of society. Examples include seeing congenital visible differences as the result of sins in a former life, vitiligo on a black person being because they wished that they were white (Rumsey et al, 1997) and port wine stains being caused by excessive consumption of strawberries or red cabbage when pregnant (Shaw, 1981).

2.6.3 STIGMATISATION THEORY

Stigmatisation theory applies to both how a person with a visible difference perceives others responses (in more detail above; 2.5.2) and helps to aid understanding of why negative attitudes exist.

Stigma can act as a tool to raise the self-esteem or overall feeling of well being of the stigmatisers (Dovidio and Gaertner, 2000; Heatherton et al., 2000). People with higher IQ and self-esteem are more likely to hold positive attitudes towards stigmatised groups (Nunally, 1961, cited in Hahighat, 2001). Conversely people with low self-esteem are more likely to hold negative attitudes towards others (Duckitt, 1994). People with low self-esteem who are subject to threat and frustration, put others down to boost themselves (Wills, 1981). Other studies have found that when people are placed in equal groups with equal rewards across groups then they feel less satisfied than when one person is treated unfairly even though they acknowledge the unfairness and injustice of the treatment (Bricknal, 1975, cited in Hahighat, 2001). Stigmatisers benefit from the presence of the stigmatised, as it allows them to feel 'superior' and redresses the balance, (e.g., so they seem and feel more beautiful when with someone less attractive) (Hepworth and West, 1988).

2.6.4 Evolutionary Theories: Disgust, Shame and Attractiveness

The evolutionary model suggests that avoidance of people with a visible difference is an instinctive protective mechanism: people discriminate to avoid danger (Wright, 1983). In the past, rejection of people who were potentially ill would have helped to ensure survival. Contagious diseases such as leprosy and meningitis are often coupled with physical markers (Kurzban and Leary, 2001; Park, Faulkner and Schaller, 2003). Therefore, humans may have evolved psychological mechanisms to respond to such features, which could trigger cognitions (negative attitudes), emotions (disgust and shame) and behaviours (avoidance) in order to protect the individual from harm.

2.6.4.1 Disgust

One of our primary emotions is disgust. Rozin and Fallon (1987), define core disgust using three criteria; the object (of disgust) is something you could eat, something that has or had a life of its own or comes from something that is/was alive, and something that has the power to make other things disgusting. Regardless of culture, people are all disgusted by: bodily secretions such as vomit, sweat, urine etc; body parts such as wounds, corpses, toenail clippings; decaying food particularly rotting meat; some living creatures such as maggots and worms, and people who are actually ill (Curtis and Biran, 2001). Using magnetic resonance imaging (MRI), Phillips (1998) found that when participants viewed facial expressions of disgust or disgusting images distinct areas of the brain were utilised. One is the insula, which plays a key role in taste. If the

insula is stimulated during brain surgery, patients have a foul taste in their mouth. If the insula is damaged, the disgust emotion can be eliminated. Another is the basal ganglia, involved in movement, cognition, and reward. Patients with Huntington's Chorea, a disease that ravages the basal ganglia, are unable to recognize expressions of disgust but can easily identify other facial expressions (Sprengelmeyer et al., 1996).

Physiologically the disgust emotion ranges from a frown, to the mouth gaping with the person likely to spit, blow air out, and make a "yuck" sound. 'Yuck' (or a variation of it) happens to be the same sound made cross culturally (Curtis and Biran, 2001). In extreme disgust, facial expressions are identical to those observed before vomiting (mouth wide open, nose wrinkled, upper lip retracted and lower lip protruded) (Darwin, 1872). This reaction is identical in different cultures across the globe (Ekman, Friesen, and Tomkins, 1971). Whilst disgust is a universally recognised emotion (Rozin, Millman, and Nemeroff, 1986) and there are factors which all cultures find disgusting (Curtis and Biran, 2001) there is considerable variation amongst cultures too. For example, people in India are less likely to be disgusted by animals and bodily products, but have higher exaggerated moral and interpersonal disgust (Rozin and Fallon, 1987). This could be an alternative explanation for why James Partridge (1990) experienced less negativity when he travelled in India than in the UK (2.5.2). Some components of disgust appear to be learnt rather than acquired (D'Amato, 1998). Also, it is possible to override the disgust response (Curtis and Biran, 2001), people find family or friends less disgusting than strangers, and some people are more sensitive to feelings of disgust than others. This could suggest that basic or innate responses can be conditioned with personal or societal values.

Curtis and Biran (2001) noted that core items that elicit disgust all have the capacity to make us ill. Therefore, they argue that disgust is a biological mechanism for avoiding infectious disease. In support of this, core objects of disgust often have several potential illnesses associated with them (Curtis and Biran, 2001). Schaller and Duncan (2003) suggest that disgust is a behavioural immune system. Whilst people have an internal immune system, this uses energy that may be necessary for other tasks (Brown, 2003). Therefore, a better form of survival is to avoid contact with the disease initially. Goodall, (1986) noted that chimpanzees act in a similar way, he observed behaviour towards a crippled male chimpanzee. Of thirty adult chimpanzees, only four actually touched the crippled male, two touched him aggressively. The biological nephew was the only chimpanzee who slept within twenty metres of him, a

further example of being able to override the disgust response. Disease-avoidant behaviours can also be seen in mice (Kavaliers, Colwell, Braun, and Choleris, 2003), tadpoles (Kiesecker, Skelly, Beard, and Preisser, 1999) and sheep (Cooper, Gordon, and Pike, 2000).

In order to develop a behavioural immune system, humans would have to develop vigilance for signs of sickness. As sickness can take many forms (e.g., cough, rash, tic) disgust would have to be, and is (Curtis and Biran, 2001) elicited by a large range of cues in order to be most effective. Therefore, people would have a propensity to detect people who are actually healthy as ill, more often than they would misinterpret ill people as healthy, in order to ensure the best chance of survival (Kurzban and Leary, 2001). Therefore, large deviations from perceived norms could be seen as infectious, and trigger a disgust response (Kurzban and Leary, 2001).

People with disabilities are often perceived as being unclean (Covey, 1998), a condition often associated with disease. Park et al. (2003) assessed negative responses to people with a physical disability. They found that people with high scores on a perceived vulnerability to disease scale were less likely to have friends with a disability. Perhaps higher concern causes them to avoid contact and therefore they are less likely to make friends, whereas lower concern makes friendship likely. They also used the implicit association test (IAT: Greenwald et al., 1998) to examine how much disability was semantically linked to disease. Disabled individuals were associated more strongly with disease, and people with high perceived vulnerability to disease associated disability with disease to an even greater extent than those with low perceived vulnerability to disease.

Attractiveness (discussed in more detail below; 2.6.4.3) may be linked to symmetricity of the face (Langlois and Roggman, 1990) and physical attractiveness is perceived positively. There is also literature, which suggests that attractiveness may be linked to health (Fink and Penton-Voak, 2002, Thornhill and Gangestad, 1999). People with very asymmetrical faces are perceived to be less healthy (Zebrowitz, Fellous, Mignault, and Andreoletti, 2003). One possibility for this is that physical unattractiveness may serve as an indicator of the presence of infection. Indeed, many visible differences affecting the face cause asymmetry. Gangestad and Buss (1993) found that physical attractiveness was most important factor in making a decision about future partners in societies with a high prevalence of infectious diseases.

In conclusion, disgust may serve as a disease avoidance mechanism. This

obviously has evolutionary advantages and may account for the avoidance of people who look different as a protective mechanism. This section has highlighted disgust within animals and humans; how disgust may be linked to attractiveness; how disgust is elicited and its possible functions. The findings of studies conducted in this area show that disease avoidance is linked to attitudes towards disability, therefore examining disgust in relation to skin conditions within this thesis is fundamental to our understanding of the evolutionary role in attitudes to visible difference. As women have generally higher disgust sensitivity than men, this may also offer an understanding of gender differences in attitudes to visible difference (Haidt, McCauley, and Rozin, 1994).

2.6.4.2 SHAME

Shame (as described above; 2.5.3) may also be used to explain attitudinal responses towards those with a visible difference. Literature (e.g., Dovidio and Gaertner, 2000; Heatherton et al., 2000) indicates that people with high self esteem are less likely to stigmatise. Shame and self-esteem are very similar constructs. Self-esteem is thought to be the cognitive component and shame the affective component (Thompson and Kent, 2001). Therefore, measuring the shame is likely to provide valuable information about the affective component of self-esteem on attitudinal responses.

2.6.4.3 ATTRACTIVENESS

In addition to the literature and review cited earlier (2.5.4), attractiveness literature is particularly pertinent to understanding attitudinal responses to visible difference.

Perception of beauty is thought to be innate (Thornhill and Gangestad, 1999), as very young infants prefer 'attractive' faces to 'unattractive' faces (Langlois, Roggman, and Rieserdanner, 1990). Studies have examined which components of a person's features cause them to be considered beautiful or attractive. Facial asymmetry is frequently considered a critical factor in evaluating attractiveness; asymmetrical faces are considered generally less attractive (Grammer and Thornhill, 1994; Thornhill and Gangestad, 1999). Ease of processing is a key factor in beauty, the more fluently an object is processed the more positive the aesthetic response (Reber, Schwarz, and Winkielman, 2004). Reber et al. (2004) found that pictures primed with a degraded version of the same picture were perceived more positively than pictures primed with other stimuli. The priming enables the viewer to process the picture faster upon normal presentation. As the pictures primed with a degraded image were

perceived more positively than the other images, this suggests that processing speed affects their positivity. It is possible that the reason symmetrical faces are associated with attractiveness is that they take less cognitive effort to process. Whittlesea (2001) proposed that the mere exposure effect (the effect that even seeing something once improves the positiveness attributed to it) could also be a result of processing fluency. Winkielman and Cacioppo (2001) assessed affective responses to pictures and found that high fluency was associated with positive affect.

If it takes more effort to process their features, this may shed some light on why people with a visible difference are viewed less positively, and could help to explain why people look longer at people with a visible difference. Also if the visible difference is considered novel (different to what the person is used to) this could also account for this phenomenon, since babies spend longer looking at new stimuli (Harris and Butterworth, 2002); perhaps staring in adulthood is a remnant of earlier days. It could also be about monitoring threat or making social comparisons.

Theories looking at social conditioning and reinforcement focus on the attitudes and stereotypes present within society and their integration into the belief system of the individual (Partridge, 1997). Western society places great emphasis on appearance with importance given to models and beauty contests, magazines feature articles on how to obtain the perfect body, and attractiveness enhances likelihood of obtaining jobs (Shahani-Denning, 2003). In addition to these elements, many negative stereotypes concerning the 'badness' of people with a visible difference can be seen in the literature and media. Historically these are prevalent in children's stories such as Three Billy Goats Gruff, Cinderella's sisters and Skelator in 'He-man'. These examples show how negative attitudes to visible difference can be maintained and established in early life (Kent and Thompson, 2003). Stereotypes have a cognitive function in that they make it easier for information to be processed, and overriding stereotypes can be difficult and cognitively demanding. This means that when societal attitudes consistently portray people with visible difference negatively, challenging and altering stereotypes can be very difficult.

2.6.5 Summary of Theories

The theories discussed above all contribute to understanding the reactions received by people with a visible difference, but very little research has been completed to ascertain if these theories are accurate in terms of understanding observer reactions. One of the aims of this thesis was to test the relevance of

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some of these theories. The theories that this thesis focuses on are components of evolutionary theories, and in particular the psychological constructs of shame, disgust and appearance schema.

2.7 CHAPTER OVERVIEW

This chapter has highlighted how widespread visible differences are, and discussed the psychological consequences of living with a visible difference, in particular a skin condition. Many of the psychological problems experienced are believed to be due to the reactions of the general public, in part real and in part exacerbated by expectations and perception of reactions.

Differences in reactions between different disabilities were described to ascertain how they varied and how visible differences fitted within the general heading of disability. This section also looked at whether reactions from the public could be generalised across different visible differences and disabilities or whether they were unique to each condition. The literature suggests that there is a similarity between different conditions in terms of reactions; these can be grouped by perceptions, physical appearance or causal aspects. In addition, when individual cases or conditions are examined there are finer differences between the groups.

The final part of this chapter addressed common theories that might account for the reactions that people with a visible difference face. The theories covered looked at how reactions and emotions may be interlinked, also considered were those that involved urban myth, and stigma. The other theories all fell under the umbrella of evolutionary theories. These were disgust, attractiveness and shame, this thesis focuses on the evolutionary component.

This literature conceptualises the problems surrounding visible difference in society and suggests possible theories for these. Helping people with a visible difference can be split into three main approaches, the first focuses on changing the views within society so that people with disfiguring conditions do not have to change and can be accepted as they are. The second stream is to help people with a visible difference to cope with their appearance and societies attitudes toward them. The third stream is to repair or disguise the visible difference (Kent and Thompson, 2003), where possible through reconstructive surgery or cosmetic camouflage. Therefore to address the first stream, attitudinal research could be used to formulate ideas to change societal views (e.g., by raising awareness as Changing Faces aims to do). In addition, an understanding of the underlying sources of attitudes and emotions may allow specific interventions to

be developed to help people with visible differences in social situations, thus addressing the second stream. In order to consider this issue it is necessary to discuss attitudes, their formation and measurement. This is discussed in Chapter 3.

Chapter 3: Attitudes; Function, Formation and Measurement: A Review of the Literature

Understanding attitude formation, function and measurement can aid our understanding of the reactions people with a visible difference receive, and help to develop ways of assessing this reaction. In this chapter attitudes are looked at initially in terms of their function; generally holding an attitude about something allows information to be sifted and assimilated faster, but it also means that outliers can be spotted faster and this may be protective. The chapter then explores the difference between implicit and explicit attitudes, concluding by looking at forms of measurement.

3.1 Definition

Fishbein (1967) defined an attitude as, "a learned predisposition to respond to an object or concept in a consistent, predictable manner". This was refined by Shaver (1989) who noted that an attitude was made up of cognitive, affective and behavioural components that predispose a person to act in a certain way. In more specific terms an attitude represents the appraisal given to an object using attribute dimensions such as 'pleasant' or 'unpleasant' (Ajzen, 2001) 'good' or 'bad', etc. This chapter will look at types of attitude, their formation and measurement.

3.2 Search Strategy

References were collated via; computerised searches using PubMed, Web of Science, Ingenta, PsychLit and Medline; e-mails or letters to authors of relevant work asking for additional unpublished material; searches of authors names; and references from articles and books. Sources were searched between 1950 and 2007. A range of search terms were used; Attitudes, Explicit, Gender, IAT, Implicit, Dual Processes, Stereotypes; as well as searches of well known contributors within the area; Dehouwer, Fazio, Greenwald and Olson.

3.3 Attitude Formation and Functionality

This section looks at attitude formation and their usefulness. Theories regarding the purpose of attitudes suggest that one of their main functions is to maintain efficient information storage and retrieval (Ashburn-Nardo, Voils, and Monteith, 2001; Eysenck, 1998). Storing information in categories allows easier access to relevant information when demand on mental resources is high (e.g., when tired, depressed, busy or distracted) (Sherman and Frost, 2000). Due to

increased technology, far more information requires processing than a generation ago, for example, in western societies, most people have access to televisions, newspapers, books, radio, etc., on a daily basis. In order to make sense of all the data available, quality is sacrificed for quantity to speed cognitive processing (Hahighat, 2001). The brain treats independent instances as the behaviour of their group (until proven otherwise) (Rothbart, Fulero, Jensen, Howard, and Birrell, 1978) because categorical representations allow the brain to function effectively (Macrae and Bodenhausen, 2000). Objects and events are categorised in order to use less memory resources, and stereotypes are used instead of detail (Macrae, Milne, and Bodenhausen, 1994), as stereotypes are activated automatically (Castillo, 2005). As a result, 'things' are fitted into categories and inevitably categories become stereotype categorisation (Allport, 1954).

Another function of categories is that unexpected events are more likely to be noticed. When something does not comply with the expectation held for it, more attention will be paid to it. If no preconceptions were held then anomalies would not be noticed. This can serve as a survival mechanism because more attention is paid to novel things (Chen and Bargh, 1999). A negative aspect of categories is that they may alter how information is processed, skewing the way people are perceived so that they align with the representation that is held. In turn this may affect recollection (Chen and Bargh, 1999).

If a target is given several descriptors, or fits into several categories, the negative descriptors are the ones that are more likely to be remembered. For example, someone with schizophrenia may be described as dishevelled, fast, fit and odd; the descriptors remembered are dishevelled and odd. One reason for this may be because the brain weights negative evaluations in preference to positive ones, possibly in order to easily remember adverse or threatening events (Kanouse and Hanson, 1972, cited in Hahighat, 2001). Rare events are associated with rare groups, generally negative events are rarer than positive and neutral events. In the example above, dishevelled and odd are rarer evaluations than fast and fit (Stroessner, 1993, cited in Hahighat, 2001). Therefore, negative events will often be categorised to form stereotypes. In turn these stereotypes may form the basis of some attitudes (Carnaghi and Maass, 2007).

It is thought that these categories are developed via societal values and personal experiences (Devine, 1989), much of which occurs throughout childhood. As children are exposed to stereotypic information, before they have

had time to develop their own opinions (i.e., with the children's stories described earlier: 2.4.3.1), sometimes their attitudes are the result of prevalent stereotypes in their social environment rather than the culmination of experience. However, a recent study suggests that implicit attitudes remain consistent from childhood through to adulthood, whereas explicit attitudes may become more balanced (Baron and Banaji, 2006). Recently, magnetic resonance imaging (MRI) has allowed an insight into which areas of the brain may be activated when attitudes are expressed. There seem to be two areas of the brain involved in attitudes; the neocortical, which is slow learning and resistant to change, holding generic beliefs (gradually accumulated through repeated exposure); and the hippocampal, which is fast learning and has temporary representations. The latter area has little long-term impact unless regularly activated, which then affects the neocortical region (McClelland, McNaughton, and Oreilly, 1995). In terms of attitudes, the neocortical region may be implemented in implicit attitudes and the hippocampal region may be involved in explicit attitudes. If the same stimuli are encountered several times by the hippocampal region this may cause eventual changes to the neocortical region, thus changing the implicit or automatic attitude.

The expectancy value model (Feather, 1982) states that as beliefs are formed, objects are spontaneously evaluated. Each belief gives the object an attribute, thus the overall attitude is determined by the values of the attributes and the strength of the associations. Having set positive and negative evaluations, people can orientate to approach or avoidance (Ajzen, 2001). Recent research shows that evaluative judgements activate different areas of the brain to non-evaluative judgements. For example, deciding if a creature is an animal or a bird would activate a different area to deciding if it was pleasant or unpleasant (Crites and Cacioppo, 1996).

3.4 Implicit and Explicit Attitudes

This section looks at two specific types of attitude; implicit and explicit, and the relationship between them.

3.4.1 Explicit Attitudes

Explicit attitudes refer to attitudes which the individual is consciously aware of or are openly described (Hewstone, Rubin, and Willis, 2002). Explicit attitudes can be further described as public (the attitudes you allow others to see) and personal (your own feelings) (Dovidio, Kawakami, Johnson, Johnson, and Howard, 1997). It has been suggested that explicit attitudes do not have a

representation in the brain since there are many contributory elements to attitudes, feelings, cognitions and expectations. Instead it has been considered that they are constructed at the time of need relying on all of these factors (Devine, Plant, Amodio, Harmon-Jones, and Vance, 2002), so in this sense attitudes are the product of all the available information at a given time.

3.4.2 Implicit Attitudes

Implicit attitudes refer to attitudes which may be outside consciousness (Dovidio et al., 1997, Fazio, Jackson, Dunson and Williams, 1995, Wilson, Lindsey and Schooler, 2000), and which rely upon existing associations or categories in the brain. Activation of a category, for example, 'flower' will also activate attributes which the individual associates with 'flowers' in their brain, such as 'plant', 'pretty' or 'fragrant' (e.g., Fazio, Jackson, Dunton, and Williams, 1995). These reactions may be immediate and outside of awareness (Ajzen, 2001). Measuring implicit attitudes has been thought to offer an uncontaminated explicit attitude (Greenwald and Banaji, 1995). In other words the implicit attitude is actually the explicit attitude before it has been contaminated by other factors such as social desirability, though some studies suggest there are additional factors (e.g., Egloff and Schmukle, 2003). Implicit attitudes are said to be fixed, and respond to change over a long period of time with repeated exposure to new information. This is important as a survival mechanism because it ensures that learned experiences cannot be overridden by an unexpected new event. Unfortunately, it also means that in a society where people are constantly exposed to stereotypes, it is harder to override immediate reactions in light of new (and sometimes) more accurate information.

3.4.3 The Relationship Between Implicit and Explicit Attitudes

If (as suggested above) the relationship between implicit and explicit attitudes were simply that the two are moderated by other factors (such as social desirability), a detectable relationship should be apparent under certain conditions. However, correlations between explicit and implicit measures have been consistently low to moderate, regardless of the social importance placed upon the attitude object (Greenwald and Nosek, 2001; Karpinski and Hilton, 2001). For example, measures of attitudes towards racism would be expected to have low correlations because participants explicitly reported attitudes would conform to what they felt was socially desirable, whereas measures of attitudes towards apples would be expected to have high correlations because the reported explicit attitude should be reflective of their 'true' attitude as there are

less social influences. However, this has not been found in previous research (Karpinski and Hilton, 2001). This suggests that there may be additional elements influencing the reporting of attitudes (Nosek and Banaji, 2002). Nosek and Banaji (2007) suggest, that some of these elements may be the amount of control, intention and efficiency involved. Also Hofmann, Gawronski, Geschwendner and Schmitt (2005), concluded that there was a relationship between the two but that other factors reduce the influence of implicit associations on explicit measures.

An alternative theory (Dovidio et al., 1997) suggests that both implicit and explicit attitudes may be 'true' attitudes, but in operation for different situations. The explicit attitude may be a determinant of actions or thoughts when there are high expectations of social judgement, whereas the implicit attitude may affect behaviours that are difficult to control, such as non-verbal behaviour (Dovidio et al., 1997).

The MODE (Motivation and Opportunity as DEterminants) model developed by Fazio (1990; Fazio and Williams, 1986) suggests that essentially a person's attitude is based upon his/her implicit cues or associations, unless they have sufficient motivation or opportunity to override them. This is the reverse of the theories above, which suggest that the implicit attitude has influence but other factors override, or get in the way of it. Motivation refers to the person's individual needs to be accurate and their personal or societal motivations to behave in a particular way. Opportunity refers to whether they have sufficient time or attentional resources to engage in deliberate rather than automatic processing; deliberate processing involves the consideration of other factors; whereas automatic processing falls back on the implicit or automatically activated attitude. This model has been supported by empirical studies, which have manipulated the need to be accurate and time pressure (Fazio et al., 1995).

McConnell (1997) discussed context dependant attitudes; the same object could have multiple attitudes depending on the context, which helps to explain the discrepancy between behaviour and attitudes. The most readily accessible beliefs have the most influence at any given time. Therefore, belief importance, accessibility, and frequency of activation all interact to form an attitude. Following on from McConnell's work, the Dual Attitudes Theory (Wilson, Lindsey, and Schooler, 2000) posits that people have two differing attitudes (Rydell and McConnell, 2006). Implicit attitudes are based on extensive exposure to a stereotype, an attitude or the attitude object. Repeated exposure

allows the attitude to be formed and stored in the slow learning system of the brain. As the attitude develops over a long period of reinforcement, continual repeated exposure to a new attitude needs to take place before the old attitude can be changed (Wilson et al., 2000). Explicit attitudes are more malleable and open to change, so they are shaped by everyday experiences and opinions and are likely to evolve and adjust long before implicit attitudes, so for a time the new attitude may override but not replace the old attitude. This model allows two attitudes to be in play at any one time, it also means that due to the stability of the implicit attitude, when cognitive resources are low the implicit attitude or stereotype is likely to be used to promote cognitive efficiency (Sherman and Frost, 2000).

A recent set of studies (Gawronski and Bodenhausen, 2006) suggest that implicit and explicit attitudes are two separate constructs. Studies looking at attitude change (see below 2.5 for more details) have found that implicit and explicit attitudes can be changed independently (Gawronski and Conrey, 2004; Karpinski and Hilton, 2001; Olson and Fazio, 2006). As a result Gawronski and Baudenhausen (2006) argue that the implicit attitude elicits automatic affective reactions, using limited cognitive capacity and evaluation. They also argue that this is activated irrespective of whether the person endorses this view (examples of this are in; Arkes and Tetlock, 2004; Devine, 1989). Gawronski and Baudenhausen (2006) suggest that the explicit attitude has its basis in the implicit attitude but also has a truth value, so the person evaluates to see if that is what they really think.

The theories described above have focussed mainly on cognitive resources and efficiency but earlier we discussed how several attributes might combine to produce an overall positive or negative attitude to an object. Ambivalence is used to describe when there are an equal number of negative and positive attitudes to an object which results in conflicting beliefs (Ajzen, 2001), so depending on the circumstances and other factors (e.g., relevance of attitudinal issue (Liberman and Chaiken, 1996)) the attitude may sway in either direction.

Another important factor within attitude research is the conflict between cognition and affect (Ajzen, 2001). When this conflict occurs, affect tends to dominate, for example, when cognition and affect were opposite for voting choice affect seemed to be the main determinant (Levine, Halberstadt, and Goldstone, 1996). In addition, the effect of cognition and affect differs from person to person. Haddock (1998) suggested that some people are primarily thinkers who rely on their cognitions to form attitudes whereas others are

feelers who depend primarily on affect. Research also shows some people are more likely to make evaluations than others (Jarvis and Petty, 1996). But this also depends on the object of evaluation (Kempf, 1999). Therefore, if something is being evaluated which is highly affect-dependant (e.g., a Disney film), then affect is more likely to be used than when the subject of evaluation involves limited affect (e.g., bricks).

3.5 Attitude Change/Inhibition

As conveyed above, there is a consensus in the research that the explicit attitude is fairly malleable and easier to change, but the implicit attitude is more fixed and resistant to change. This section looks at attitude change in greater depth.

Changing or overriding implicit attitudes is thought to be difficult and cognitively taxing (Hummert, Gartska, O'Brien, Greenwald, and Mellott, 2002). Recent research also suggests that attempts to consciously suppress stereotypes may cause them to rebound, making them even more salient (Wyer, Sherman, and Stroessner, 2000). There are different methods of inhibiting stereotypes, some of which may employ less cognitive effort (von Hippel, Silver, and Lynch, 2000). If the stereotypes are not activated at all (Fazio et al., 1995) this will take less effort than inhibiting or rejecting all stereotypes (Devine, 1989) or reinterpreting negative stereotypes as having either positive or neutral valence (Wittenbrink, Gist, and Hilton, 1997). This suggests that there are some circumstances in which suppression is not too difficult. Macrae, Bodenhausen and Milne (1995) found that when participants were exposed to two stereotypes simultaneously (for example, 'a Chinese woman'), participants were able to suppress one of them without cognitive pressure, depending on what she was doing; applying make-up (suppression of Chinese) or eating with chop-sticks (suppression of woman). Also, it has been noted that stereotypes are not automatic for all people (Lepore and Brown, 1997), which could be related to a balance of viewpoints in early life (Devine, 1989). In summary, attitude inhibition varies in cognitive demand depending on the conditions; in some circumstances it seems to be an automatic process whereas in others it takes cognitive effort. In the study by Grandfield, Thompson and Turpin (2005), they hypothesised that the reason people took longer on the implicit association test if they knew somebody, was because they were inhibiting their stereotypes. If this were the case, you would expect a stage where inhibition no longer occurred because the implicit attitude had been modified over time. This might be seen in people with very close relatives with very severe conditions or in people who have a

skin condition themselves.

Exploration of implicit and explicit attitude change has been undertaken, findings indicate that whilst explicit attitudes can be changed fairly rapidly by exposing people to new information such that they change their evaluation (Gawronski and Bodenhausen, 2006; Rydell and McConnell, 2006), implicit attitudes take more time (Baccus, Baldwin, and Packer, 2004). Implicit attitudes are thought to be changed either by changing the structure of existing associations, or by creating new associations (Smith, 1998).

Attitude change has also been looked at specifically in relation to the IAT, to see whether exposure to relevant information can alter implicit responses on the IAT. In one study (Czyzewska, 2007) students completed an IAT looking at associations to marijuana or tobacco. However, participants were either shown anti-tobacco or anti-marijuana science programs prior to completing the IATs. They found that when pre-existing attitudes were controlled for, participants had increased negativity on the IAT that corresponded to the science program they viewed. However, this only indicates a short term effect, the study did not follow up to see whether there were any lasting effects on implicit attitude. Another study (Baron and Banaji, 2006) assessed race bias in six year olds, 10 year olds and adults, little difference was found across the lifespan, suggesting that change may be more difficult, though it is also possible that there were no interventions to challenge the implicit view.

3.6 Attitude Measurement

In the past, it has been assumed that attitudes are open to inspection, thus by asking people what they think about an object or measuring their emotional responses or behaviour toward an attitude object, a true representation of their attitudes could be established (Karpinski and Hilton, 2001). However, examining these dimensions often produced low consistency across the measures employed, even when the attitude object was in an area where social desirability (Eysenck, 1998; Richeson and Ambady, 2003) was unimportant (Greenwald and Banaji, 1995). Traditionally attitudes have been measured via the use of questionnaires, interviews or behavioural observation. These measurements only allow explicit attitudes to be examined, but unfortunately these are not always an accurate representation. As discussed above, social desirability may influence how the person responds to the questions. Participants may also be swayed by what they think is expected of them, and other factors such as how tired or stressed or how emotional the participants

are may have an impact.

As explicit attitudes are so difficult to measure accurately, increased interest has been shown towards implicit measurements. The dot probe paradigm (MacLeod, Mathews, and Tata, 1986) has been used to assess selective attention to certain stimuli. Quicker reaction times to the dot when it occurs in the same location as the stimuli of interest are often interpreted as vigilance to that type of stimuli. For example, in studies where the stimulus of interest is self-esteem, letters and numbers that are personal to the individual (i.e., their age or initials) were compared to neutral characters. Faster reaction times when associated with personal characters is associated with higher self-esteem in the individual (Brendl, Chattopadhay, Pelham, Carvallo, and Pritchard, 2003). Fazio and Olson (2003) used affective priming tasks which allow them to assess what the presentation of an attitude object activates in memory. Using pictures of black and white-skinned undergraduates as primes, they presented positive and negative adjectives, which participants were asked to categorise as positive or negative. They found faster reaction times to negative adjectives when preceded by a prime of a black-skinned undergraduate, and faster reaction times to positive adjectives when preceded by an undergraduate with white skin. This indicates preference for white over black skinned undergraduates. Additional implicit measures include semantic priming (Wittenbrink et al., 1997), Go/No-Go tasks (Nosek, 2001), affect misattribution (Payne, Cheng, Govorun, and Stewart, 2005) and the IAT (Greenwald et al., 1998).

There has been much recent interest in the IAT (Greenwald et al., 1998). The test is fairly robust in its measurement and is adaptable to measuring attitudes about a wide range of concepts, there is also evidence that it is a better predictor of behaviour than explicit measures in some circumstances (Ellwart, Rinck, and Becker, 2006). Since its initial implementation, the research employing the IAT has split into three main streams: a general measure of preference; its range of uses has included measurements of racial preference (Dasgupta, McGhee, Greenwald, and Banaji, 2000), age preference (Hummert et al., 2002), bias against obese people (Teachman, Gapinski, Brownell, Rawlins, and Jeyaram, 2003), dysfunctional beliefs in psychopathology (DeHouwer, 2002) and consumer preference (Brunel, Tietje, and Greenwald, 2004; Friese, Wanke, and Plessner, 2006; Maison, Greenwald, and Bruin, 2004); as a clinical measure; assessing change or level of self-esteem (Egloff, Schwerdteger, and Schmukle, 2005; Tanner, Stopa, and De Houwer, 2006) or cognitions in sexual offences (Nunes, Firestone, and Baldwin, 2007); and in order to look at underlying functions of the IAT methodology (Kinoshita, Peek,

and O'Leary, 2006; Perugini, O'Gorman, and Prestwich, 2007). Due to the robustness and flexibility of the IAT, this thesis focuses primarily on the IAT as a measure of implicit attitudes in relation to skin conditions.

Of particular relevance to this thesis, the IAT has been used to look at attitudes toward disability (Pruett, 2006; White, 2006), and the stigma of mental illness (Teachman, 2006). The former studies found an implicit bias for people without a disability in the general population, the latter study found an implicit bias against mental illness in a general population and also within a clinical sample.

3.6.1 Implicit Association Test

Greenwald et al. (1998) designed the IAT in order to measure implicit attitudes. This test allows the relative strengths of associations between two concepts to be measured so that the researcher is able to ascertain whether one concept is perceived more positively than is another. The IAT only measures the actual strength of attitudes, rather than whether they lie in either a positive or a negative direction. The initial IAT required participants to categorise flowers and insects and pleasant and unpleasant words. Greenwald et al. (1998) did this using two possible responses; a key representing left and a key representing right. Each key was assigned to two of the concepts, so for example the left key may be assigned to 'flower' and 'pleasant' and the right key to 'insect' and 'unpleasant'. DeHouwer (2001) suggests that the IAT is effective because when an attribute (e.g., positive) and a target (e.g., cat) are assigned to the same key (and they do not conflict) this automatically activates the same module within the brain (the brain has associated a short-term positive valence with that key) allowing a fast and accurate response. However, when the attributes and the concept conflict (e.g., spider and pleasant), either the incorrect response is automatically activated and the participant has to override it, or the correct response is automatically activated but to a lesser degree, thus explaining the slower reaction time.

In order to understand the basic underlying theory behind the IAT it is important to look at the structure of the brain. The IAT operates on the assumption that the brain is ordered into highly structured modules (Eysenck and Keane, 1995). This means that specific areas of the brain are responsible for completing particular tasks (Ellis and Young, 1996). In order to do this, information is stored in such a way that it can be accessed quickly, much in the way a library stores related books together. However, the brain is far more organised; when one item is used, a whole range of related items are primed (activated) so that they can be accessed quickly. If someone accesses the word 'cat' in their brain,

closely related items such as 'dog' and 'tiger' will be primed as well as familiar sounding words such as 'can', 'catty' and to a lesser degree words related to the subsidiary circle of words (Manktelow, 1999). To clarify, if someone associates cats with darkness, words like night will also be activated and if someone is fond of cats, pleasant words in their brain would be primed more than unpleasant words. Therefore if their reaction times to cats and pleasant versus unpleasant were being measured, then the time would be faster for pleasant words. Testing this would give us an idea of a person's implicit attitudes to cats. The IAT uses the same principle.

An understanding of the processes behind the IAT allows us to establish a greater understanding of the results found using the IAT. The IAT measures associations in the brain, which could have been learnt within the participant's environment or they could be innate. Devine (1989) argues that these associations are developed at an early age through the stereotypical values of others and that repeated exposure to these values enables them to become fixed. This could be enhanced during the developmental stage in childhood, during which children prefer familiarity and shy away from people who are different (Augoustinos and Reynolds, 2001). An alternative view is that people automatically prefer the familiar and will always opt for the in-group (people perceived to be similar to oneself) when there is an absence of knowledge regarding the out-group (people perceived to be different) (Ashburn-Nardo et al., 2001).

Brendl, Messner and Markham (2001) showed participants insect words and nonsense words, they found that the reaction times for nonsense words were slower than those for insects. This would initially indicate that they liked nonsense words less than insects, which seems unlikely because there would be no reason to dislike them. Brendl et al. (2001) suggest that the IAT merely taps the associations present in the individual's environment and that this is not predictive of any behaviour or explicit attitudes the individual may have. An alternative is that because the words were unfamiliar it took a long time for the person to process them, so care needs to be taken to ensure participants are familiar with both categories within an IAT, else the results may be unreliable. If these associations were innate, and therefore universal, the findings for the IAT should be very similar across participants for all constructs (despite the reported explicit attitudes). However this does not appear to be the case (Greenwald and Nosek, 2001), as participants have been shown to vary widely in the strength of their associations depending on which constructs are being measured.

Although the debate about how reliable the IAT is as a predictor of explicit attitudes and/or subsequent behaviour is ongoing, the IAT may enable us to gain an understanding of individuals' attitudes towards people with disfiguring conditions (Grandfield et al., 2005). Its usefulness as a potential predictor of behaviour and/or explicit attitudes may have to wait until further understanding of possible moderators have been established, though initial studies are promising (Ellwart et al., 2006). It is also prudent to look at explicit measures to establish how our correlational strengths align with previous research.

There is an ongoing debate regarding what the IAT actually measures and commentary on the usefulness of the responses at all (Blaison, 2006; Gawronski and Conrey, 2004). This is related to the debate surrounding the nature of implicit attitudes (Devine, 1989). If implicit associations are formed by exposure to stereotypes it is likely that the IAT is tapping stereotypes and attitudes present in society (Brendl et al., 2001; Devine, 1989; Perugini et al., 2007) rather than the individual's views. Research examining attitudes to known stereotypes has been inconclusive: IATs using spider stimuli found that, irrespective of the individual's personal standing, spiders were viewed negatively (Teachman, Gregg, and Woody, 2001), as was smoking regardless of the smoking status of the participant (Swanson, Swanson, and Greenwald, 2001). However, an IAT on sexuality found that homosexuals had a more negative attitude towards heterosexuals than homosexuals (Banse, Seise, and Zerbes, 2001). These areas of interest had different weightings and associations linked to them: liking of spiders is hardly comparable to liking people of a particular sexual orientation but it does emphasise the apparent inconsistencies within IAT measurements.

Implicit associations, which are formed by experience, are likely to represent the individual's own views (Greenwald and Nosek, 2001). Perugini et al. (2007) found that likelihood of own rather than societal views being expressed could be enhanced by making participants consider themselves before completing the IAT. Added to this is the possibility that implicit associations can change over time given the right exposure (Wilson et al., 2000), which suggests that the IAT may measure different elements depending on the individual. Devine, Plant, Amodio, Harmon-Jones, and Vance (2002) found that there was a relationship between whether individuals were internally or externally motivated (whether their motivation was personal; they had a personal reason to be unbiased, or societal; think that others see it as undesirable to be biased) to respond without prejudice. When internal motivation was high, the IAT results were moderated whereas external motivation did not affect the IAT. It could be that internal

motivation is a factor, which moderates the evolution of the internal association. However, a second study exploring internal and external motivation (Hausmann and Ryan, 2004) found that participants with high internal motivation had lower implicit prejudice, and those with external motivation had higher implicit prejudice. The studies have inconsistent results with respect to the explicit attitude, though both were looking at racism, it is unclear what the reason for this is, but further studies may add an explanation.

Another factor worth considering is that when people do not have strong implicit associations or views to rely on, they automatically prefer the familiar (Augoustinos and Reynolds, 2001) and in these circumstances will usually opt for the 'in-group' (people perceived to be similar to oneself) (Ashburn-Nardo et al., 2001). This debate complements the information on stereotypes and implicit attitude establishment (3.4). Indeed Karpinski et al. (2005) found that attitude importance could also have an impact on the relationship between implicit and explicit measures. Although the debate is compelling, it is generally accepted that the IAT measures our learnt associations and whilst not always necessarily representative of our attitudes may inadvertently affect our behaviour (see special edition of Journal of Personality and Social Psychology, 2001 for an overview). It is likely that at times the IAT detects the individual's knowledge of stereotypes (Karpinski and Hilton, 2001) (particularly when their personal views are negligible or when they are preoccupied) offering an insight into societal views (DeJong, Van Den Hout, and Rietbroek, 2000) and at other times represents the individual's feelings (Mitchell, Anderson, and Lovibond, 2003).

The relationship between the IAT and explicit attitudes is still being established. Correlations between the measures consistently have significance ranging from moderate to non-significant (Greenwald and Nosek, 2001). Therefore Karpinski and Hilton (Karpinski and Hilton, 2001) suggested that the IAT may be detecting knowledge of stereotypes rather than how much the participants endorse those stereotypes within their behaviour. Nosek and Banaji (2002) suggest that explicit and implicit measures are related but that there are several factors that moderate the relationship which have not been looked at previously. The way a person tries to present themselves to others and how they elaborate on this have been tentatively identified as at least two of the possible moderators (Nosek and Banaji, 2002). When these variables were controlled for within existing data, the strength of the correlation between the implicit and explicit measures increased.

In terms of predictive ability of behaviour from implicit and explicit attitudes,

Perugini (2005) has proposed three models; the first is where implicit and explicit both add a different element to the prediction of behaviour (in terms of variance); the second is where they both add an element but there is also an interaction between the two; and the third is where implicit attitudes predict automatic or spontaneous behaviour, whereas explicit attitudes contribute to deliberate behaviour. In studies, they found that attitudes about smoking support the second model, whereas attitudes about choice of snack support the latter model. The two attitudinal objects (snacks and smoking) differ in that there is much larger negativity surrounding smoking, particularly in terms of its detrimental health effects. From childhood, smoking is seen as something negative, whereas sugary snacks are seen as fine in moderation. It could be that encoding of attitudes in childhood affects how they contribute to behaviour in later life. These constructs differ from visible difference though, in that they represent a lifestyle choice, rather than an attitude towards a group or individual. However, it does highlight that differences between implicit and explicit attitudes may be attributable to a number of reasons, in some circumstances (i.e., interactions), it seems that they are measuring elements that are the same, whereas when they predict behaviour under differing circumstances, it could be argued that they are measuring different components of attitude.

3.6.1.1 Visible Difference Implicit Association Test

Only one previous study has specifically used the IAT to explore attitudes in relation to visible difference (Grandfield et al., 2005). In this study, the IAT was adapted to establish whether there was a difference in implicit attitudes to people with skin conditions versus people with clear skin. The IAT was chosen to measure implicit attitudes over other tasks because it was felt that the IAT was more robust. The aim of the initial study was primarily to find out if there was a difference in implicit attitudes and the IAT was the best methodology in terms of ease of finding stimuli (priming tasks require paired stimuli) and had been used most widely for looking at preferences between two types of stimuli.

The study found highly significant differences between participants' reaction times to pictures of people with and without skin conditions using the IAT. The results also showed that knowing someone with a skin condition made these reaction times significantly longer. The study did not find any significant effects of knowing someone with a skin condition or of ever having had a skin condition.

This research showed that people respond differently to those with a visible

difference. There is a consistent difference in reactions to people with skin conditions but the study does not allow insight into the strength, direction or emotions involved within these reactions. Although there was no difference within the reaction times of the IAT results, if someone had had a skin condition in the past, only 33% of participants had had a skin condition. It was unclear in what context (whether they had seen a medical doctor or whether it had been very mild). Respondents took longer to respond to the stimulus if they knew someone, which Grandfield at al. (2005) conclude may be indicative of the participants suppressing their implicit reaction.

From the attitude literature, people who know someone with a skin condition may exhibit two responses within their implicit response. These could be; participants with stereotype inhibition, and (as they progress) participants with similar reaction times for both the congruent (i.e., pleasant and clear skin, or unpleasant and skin condition) and incongruent (i.e., pleasant and skin condition, or unpleasant and clear skin) conditions suggesting integration of implicit and explicit attitudes. Exploring the length of time someone had known someone may have shed light on this. The main limitations of Grandfield et al. (2005) study were those incurred by the IAT itself. It was difficult to ascertain the nature of the attitudes, how they developed and the impact they had on behaviour. This thesis uses this study as a starting point and aims to build on the limitations of the study in order to gain a greater understanding of attitudes towards visible difference and answer some of the questions regarding what the implicit reaction is telling us.

3.7 Chapter Overview

This chapter has looked at attitudes in terms of what they are, how they develop, their function and methods of measuring them. The latter part of the chapter focussed on the IAT as a means to measure implicit attitudes, discussing its strengths and weaknesses. Finally, a study that employed the IAT to measure attitudes to skin conditions was described. This chapter has allowed us to see how attitudes are formed, what may affect them and how they can be measured.

However, there are limitations to the attitude measurements discussed. Implicit and explicit attitudes measure differing components and both give only an overview of positive and negative affect. The next chapter will look at psychophysiology as a means of measuring the emotional component of reactions to stimuli.

Chapter 4: Psychophysiology: Review of the Literature

This chapter examines psychophysiology and how it can be used to assess arousal, attention and emotion. Initially the chapter looks at theories of emotion and physiology associated with it. The chapter then focuses on the three psychophysiological measurements employed within this thesis, discussing their usefulness and relevant studies.

4.1 Search Strategy

References were collated via; computerised searches using PubMed, Web of Science, Ingenta, PsychLit and Medline; e-mails or letters to authors of relevant work asking for additional unpublished material; searches of authors names; and references from articles and books. Sources were searched between 1950 and 2007. A range of search terms were used; Affect, Attention, Corrugator Supercilii, Disgust, Electromyography, Emotion, Gender, Heart Rate, Levator Labii, Psychophysiology, Skin Conductance, Skin Condition(s) and Zygomaticus Major.

4.2 Psychophysiology; Rationale for Use

Chapter 3 looked at attitudes, their formation, measurement, and the distinction between implicit and explicit measures. Explicit measures were ascertained by asking people directly what they thought, either verbally or using questionnaires. However, self report data may be influenced by a variety of factors, such as what the participant believes is being tested, how anonymous they believe the data to be, the image they want to convey, misinterpretation of the questions or inaccurate perception of self (Turner and Martin, 1984). Also, ascertaining the value of the measures is difficult as it is hard to measure the cognitions behind them (Kipnis, 1997). Implicit measures (e.g., the IAT) are a useful way to bypass these issues, by looking at the strength of association between two concepts, rather than asking the person directly. A disadvantage of the IAT is that it can only show preference for one group over another (Greenwald et al., 1998), not whether the attitude is positive or negative.

An alternative way of measuring emotional responses to stimuli is by observing the participant whilst he/she is viewing the stimuli (Izard, Kagan, and Zajonc, 1984; Lang, Levin, Miller, and Kozak, 1983). This allows observers to rate reactions, but can be time and resource consuming and relies on overt expressions (which can be affected by the presence of a camera or observer).

More than six distinct emotions can be coded in this way (Ekman and Friesen, 1986). Observation is subjective, even when coded by several people there can be limited congruity between them. Psychophysiology is advantageous over overt measurements in that it is easier to interpret and code. Changes that are too subtle to be observable (Cacioppo, Martzke, Petty, and Tassinary, 1988; Vrana, 1993) can be measured, and these measurements are also objective, so observer errors are eliminated. Quantifying the body's responses to stimuli can enable distinctions to be made between valence, arousal and affect. Emotional responses often underlie attitudes, for example disgust was considered a possible reason for avoiding people with a visible difference (see Chapter 2; 2.6.4.1) and Partridge developed the SCARED model (see Chapter 2; 2.6.1) to try and interpret the different responses people have. Psychophysiology can be used to measure gross emotional responses; therefore, the use of this methodology may allow greater understanding of the emotional and thus attitudinal, responses to skin conditions.

This chapter looks at how psychophysiology can ascertain emotional responses. Some commonly used physiological recordings, particularly those employed within the thesis are described. However, the biological basis of the physiological systems used has not been looked at in depth. For a greater understanding of the biological processes involved please see Cacioppo et al. (2000).

4.2.1 Psychological Rationale for Psychophysiology

Many aspects of social behaviour are automatic; psychophysiology provides a nonverbal, objective, relatively bias-free method of observing participants' responses, allowing subtle cognitive and affective responses to be measured (Cacioppo and Sandman, 1981). Psychophysiology has some of the benefits associated with observational studies because it allows observations of responses to be gathered, but at a more quantifiably accurate level. However, covert observation has an advantage in that participants may not be so aware that they are being observed, or fully know what is being measured. In addition, within psychophysiology the presence of electrodes may affect responses in a way covert observation does not. A further advantage of psychophysiology is that as participants are unable to inhibit or alter their automatic response, data gained is likely to be very reliable (Summers, 1970).

4.3 Psychophysiology and Emotion

Current theories of emotion have developed as a result of two main competing

viewpoints; James and Cannon (cited in Gleitman, Fridlund, and Reisberg, 2003). James's views were independently supported by Lange and are often referred to as James-Lange, they proposed that the physical response to a stimulus precedes and establishes the emotion. This viewpoint conjects that in order to feel an emotion a physical change must occur, and therefore emotion did not occur solely within the brain. Cannon's opposing view was that emotion could be produced solely within the brain, he believed that stimulus simultaneously triggered emotion and physiological responding (Gleitman et al., 2003). In order to endorse this view he severed cats' neural connections to their cortex to demonstrate that they still exhibited emotion, without awareness of physical responses.

A study by Landis and Hunt (1939) also suggested that there may be more to emotion than suggested by the James-Lange model. They injected participants with adrenaline, causing physiology akin to fear and rage. Whilst participants could liken how they felt to specific emotions they were aware that that was not how they actually felt. The cognitive approach suggested (Arnold, 1970) that cognitions could play a role in the differentiation of emotion. For example, if someone spots something on the floor, their reaction may be very different if they interpret the object as a spider, than if they interpret it to be a piece of string. This theory was defined further by Schacter and Singer (1962), they suggested that emotional experiences require both emotional arousal and cognition. The cognitive appraisal of the stimuli leads to the subjective emotion.

However, research indicates that there are different physiologies associated with specific emotions; anger, sadness and fear have different autonomic patterns (Funkenstein, 1956) and there are different facial patterns for the fundamental emotions (Ekman et al., 1971; Ekman, Levenson, and Friesen, 1983). The fundamental emotions are recognised cross-culturally, and can be identified accurately by studying facial patterns. Six emotions (anger, disgust, happiness, sadness, fear and contempt) are generally agreed upon, with suggestions that shame and guilt may also be fundamental (Izard, 1971). These theories each offer compelling viewpoints of emotion; it is generally thought that emotions encompass different aspects of the theories.

Emotion can also be defined as discrete and biphasic. The discrete view of emotion believes that each emotion has a distinct physiological pattern associated with it (Bradley, 2000), so there is a variation for all emotions. This view looks at each emotion as a distinct whole, such as 'anger', 'happiness' and 'jealousy' (Ekman, 1972; Panksepp, 1998). Cacioppo (1993) looked at whether

specific physiological responses could be matched to specific emotional feelings, they found little evidence by looking at body temperature, blood pressure, skin conductance and cardiac responses. Also, it has been difficult to ascertain whether looking at a specific emotion such as sadness can be used to explain feelings or behaviour, just that feelings and behaviours can be explained by the use of the term sadness (Lewontin, 2000). This suggests that these emotions could be socially constructed rather than have a biological basis, and thus explains why some people do not understand the difference between an angry feeling and a guilty feeling, yet everyone can differentiate between pleasant and unpleasant feelings (Barrett, 1998; Feldman Barrett and Russell, 1998; Feldman, 1995).

The biphasic view theorises that the basic dimensions of emotion are pleasure and arousal (appetitive and aversive) (Dickinson and Dearing, 1979). In evolutionary terms, pleasant stimuli would be those stimuli that elicit an approach response and unpleasant stimuli would elicit a withdrawal response. Schnierla (1959) noted that these were the only dimensions applicable to all organisms. In animals, approach stimuli would be associated with food, shelter, mating and ultimately survival; withdrawal would include defence, huddling and flight. An additional factor is arousal, in animals this is thought to have been the intensity with which they approached or withdrew from something in their environment (Schnierla, 1959). Tellegen (1985) factor analysed personality and mood questionnaires finding two major factors, most variance was explained by valence (positive/negative or pleasant/unpleasant) and then arousal (excited/ calm). Arousal indicates the extent to which the approach or withdrawal response is activated. Situations and objects are automatically evaluated (e.g., Bargh and Ferguson 2000; Brendl and Higgins, 1995, Lazarus and Folkman, 1984) to assess how important they are to well-being. Mehrabian (1970) found that hedonic valence was primary in making judgements about non-verbal behaviour, for example posture and facial expressions. This also appears to be how people categorise everything around them, Osgood (1969) asked people to rate words on different factors and found that hedonic valence was most important to their organisation.

In an attempt to integrate the biphasic view of emotion with discrete emotional states, Ortony (1988) looked at the features of stimuli and events to differentiate between emotional terms. They used hedonic valence to differentiate between positive and negative affect, then by looking at the features of the stimuli they suggested that emotion could vary according to three factors: whether it had happened, whether there was a possibility of it happening, and whether it was

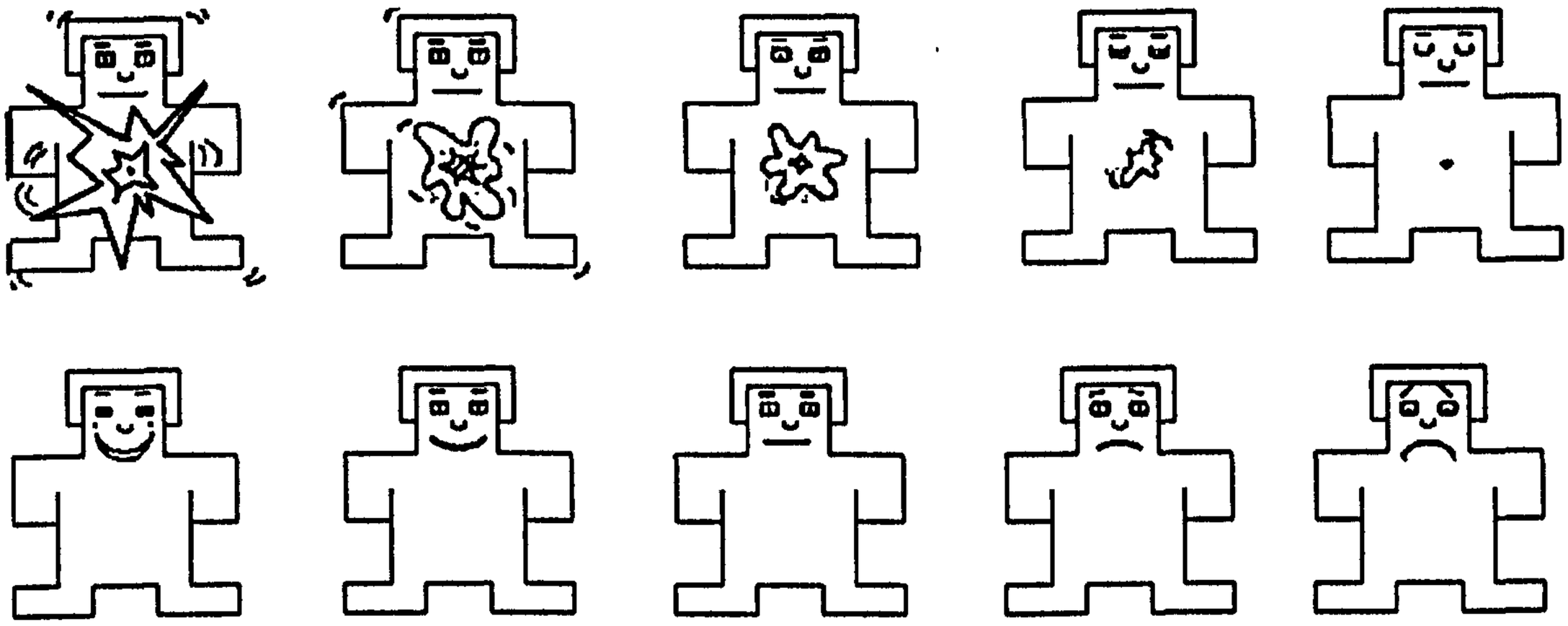
currently happening. For example, an emotion associated with an unpleasant event, that *had* occurred could be described as 'distress', whereas if the event *may* occur then this could be 'fear'. This methodology could take some time before it accurately represents emotional states, but it indicates the move toward integration of the discrete and biphasic theories of emotion. On the negative side even if emotions can be identified, psychophysiology does not allow feelings within the individual to be understood.

Lang and colleagues have used the biphasic view of emotion to examine visual imagery using psychophysiology (Lang, Greenwald, Bradley, and Hamm, 1993, Bradley, Greenwald and Hamm, 1993). Similarly to Tellegen (1985) analyses of stimuli have found that the principal variance could be explained by valence and arousal (Lang, Bradley, and Cuthbert, 1990, Witvliet and Vrana, 1996). Lang proposes that all emotional states can be defined by their position in two-dimensional space varying along these parameters. The position in this affective space has been shown to impact upon behaviour (e.g., facial expression) and physiology (e.g., heart rate, facial electromyography (EMG), and galvanic skin response (GSR) (e.g., Bradley and Lang, 2000; Cacioppo, Berntson, Klein, and Poehlmann, 1997; Cacioppo, Berntson, Larsen, Poehlmann, and Ito, 2000; Cacioppo and Gardner, 1999).

4.4 International Affective Picture System

The development of a common set of standardised stimuli that can be used within studies of psychophysiology and emotion ensures continuity and comparability across studies. Before the development of the International Affective Picture System (IAPS), there was no way of understanding whether effects witnessed were due to differences in stimuli valence and effect or other variables of interest. Using stimuli from the IAPS alongside additional stimuli also ensures that new stimuli can be grounded within a theoretical context, and the effectiveness of the measures can be ascertained. Based on the biphasic view of emotion, various sets of stimuli have been composed, including sounds (Bradley and Lang, 1999b), words (Bradley and Lang, 1999a) and pictures (Lang, Ohman, and Vaitl, 1988). All of the pictorial stimuli have been rated extensively by participants on the Self-Assessment Mannequin (SAM; see Figure 4-I) affective rating scale (Bradley and Lang, 1994) for valence and arousal. The database of pictures is now published as the IAPS. The images in the IAPS consist of positive, negative and neutral pictures that vary along valence and arousal continuums.

Figure 4-I: The Self-Assessment Mannequin



The top row indicates very arousing to not at all arousing and the bottom very pleasant to very unpleasant.

As the valence of the images increases or decreases, arousal increases. The same pattern is also witnessed with other stimuli (Bradley and Lang, 1999a, 1999b; Detender, Simons, and Bennett, 1998; Witvliet and Vrana, 1996), suggesting similar perceptual organisation for all stimuli. When stimuli were neutral on valence, arousal was low, suggesting little motivation to approach or withdraw. When valence and arousal are plotted against each other on a scatter plot, there are high correlations between the two. The gradients for positive and negative affect almost exactly map onto approach and avoidant behaviour in rats (Miller, 1959) adding further support to the theory of valence developing from appetitive and avoidant behaviour in animals. In both rats and humans there is a greater response to aversive stimuli, possibly because this may be necessary for survival, whereas approach forms the basis for familiarising with and exploring the environment. The correlation between unpleasant and arousal is greater than between pleasant and arousal, possibly because, humans also rate stimuli by their aesthetic appearance, such that clouds have high pleasure ratings (Bradley, 2000). The scatter plot of stimuli in the IAPS resembles a boomerang type shape (due to the limited stimuli representing low arousal but highly valenced stimuli).

The images in the IAPS can be used to assess psychophysiological reaction to stimuli of varying valence and arousal. Bradley (2000) recommends that at least three types of stimuli should be used (positive with high arousal, neutral with low arousal, and negative with high arousal), in order to assess whether effects are due to valence or/and arousal. Including neutral stimuli allows the effect of

completing the task itself to be monitored (e.g., anticipation). The difference between the neutral stimuli and those with high and low valence allows the effect of emotions to be ascertained. The IAPS has allowed physiological reactions and their covariation to be assessed (Bradley, 2000). It has been found that electromyograms and heart rate covary with valence, whereas SCR covaries with arousal on the IAPS. Women have stronger relationships between EMG and pleasure, men between SCR and arousal (Cuthbert, Bradley, and Lang, 1996; Lang et al., 1993)

4.5 Psychophysiological Measures

Psychophysiology can be measured using either central or peripheral measures. Central measures are those that give insight into the workings of the brain such as fMRI or EEG, whereas peripheral measures such as EMG or ECG allow you to measure the body's responses to its environment. This PhD focuses on peripheral measures as understanding the body's responses gives a greater insight into attentional, attitudinal and emotional responses to stimuli. Future studies could look at processes within the brain to gain an understanding of where these responses originate and their underlying function.

Three types of psychophysiological measurement are looked at in detail within this chapter, heart rate, skin conductance response (SCR) and electromyography (EMG). Attention is looked at through the use of SCR and heart rate (Dawson, Schell, and Filion, 2000). Heart rate and EMG both allow levels of arousal to be ascertained. Heart rate is also a measure of emotional valence, though EMG has better covariation with valence and can also differentiate between some discrete emotions (Cacioppo, Petty, Losch, and Kim, 1986b). Although EMG is a more powerful tool for measuring emotion, there are significant gender effects, with only a quarter of men in some studies having reliable EMG (Hugdahl, 1995), whereas within heart rate measures reliability is fairly even across gender groups.

4.5.1 Heart rate

One of the most commonly employed measurements in psychophysiology is heart rate. In adults the normal range of beats per minute (BPM) is between 50 and 140 BPM with a resting rate of about 70 BPM (Hugdahl, 1995). Psychophysiologists use two main methods to acquire heart rate; measuring either the electrical events that accompany the cardiac cycle or measurement of pressure at a peripheral site following ejection of blood from the heart (Turpin and Siddle, 1983). The research within this thesis uses an electrocardiogram

(ECG) to record the electrical signals generated during the cardiac cycle.

As the heart is innervated by both the sympathetic (SNS) and parasympathetic nervous systems (PNS) (Papillo and Shapiro, 1990), a change of activity in either system can affect heart rate. The PNS causes heart rate to decrease, whereas the SNS produces an increase, heart rate is also affected by the release of adrenaline. As these two systems often interact it can makes the interpretation of heart rate difficult (Cuthbert et al., 1996). However, specific functions have been linked to cardiac activity, as the intensity of an emotional experience increases, so does heart rate. Positive emotions are associated with greater activity than negative emotions (Lang, 1993). Heart rate is a good indicator of the level of arousal of a stimulus, and when looking at discrete emotions, studies have shown that heart rate increases for fear, anger (Ekman et al., 1983) and happiness (Levenson, Ekman, and Friesen, 1990).

Viewing visual stimuli produces a triphasic wave-form (Lang and Hnatiow, 1962), this is an initial deceleration, followed by an acceleration and then a secondary deceleration. Lacey (1959; 1963) suggested that deceleration during the primary response facilitated cortex activity enabling information to be processed, they termed this 'sensory intake'. This allowed information to be inputted in preparation for a response. Heart rate data could provide information about the amount of attention required, and that physiological change can either indicate or facilitate attention (Jennings, 1986). In contrast, Obrist (1981) proposed that during sensory intake, the environment is being attended to, so muscle tone and metabolic demands are reduced. Numerous studies have looked at the effects of heart rate to aversive stimuli, Hare (1971; 1973) found that heart rate deceleration was greater when looking at homicide victims than female nudes (see also, Bradley, Cuthbert, and Lang, 1990; Lang et al., 1993). However, when subjects are fearful of the stimuli shown (e.g., arachnophobics looking at spiders), there is a rapid heart rate acceleration (Hare, 1973). In this circumstance Lacey (1974) suggests that this indicates a rejection of information. These studies led Graham and Clifton (1966) to propose that the OR is indicative of cardiac deceleration and the DR indicative of cardiac acceleration.

In summary, the initial deceleration is associated with orienting and sensory intake (Lacey, 1967), which is related to phasic changes in attention and is elicited by novel, unexpected or meaningful stimuli (Turpin, 1986). When viewing images, affective valence contributes to the amount of initial deceleration and the subsequent acceleration. The acceleration is a result of

defence or startle responses (Hare, 1973). The secondary deceleration is associated with eye gaze viewing, decreased heart rate is due to a decrease in somatic activity (Obrist, 1981). More intense stimuli facilitates greater deceleration and attention. If the stimuli are very unpleasant, this results in gaze aversion and thus less viewing. Therefore, unpleasant scenes have greatest deceleration (Bradley et al., 1990; Hare, 1973; Lang et al., 1990). In some cases, highly unpleasant pictures have no acceleration at all, instead they show a continuous deceleration for the entire viewing time, (Bradley, Greenwald, and Hamm, 1993).

4.5.2 Electrodermal Activity[3]

Electrodermal activity (EDA) is a measurement of the skin's ability to conduct electrical current (Hugdahl, 1995). Changes in EDA reflect fluctuations of eccrine sweat glands, which are innervated by the sympathetic nervous system (Boucsein, 1992). Activity is caused by changes in attention elicited by arousal, emotion, task demands, stress, and so forth (Dawson et al., 2000), which causes the palmar and plantar regions of the hands and feet to become moist. Hydration of the skin means less resistance for electrical current (Hugdahl, 1995). Therefore increased activity in the SNS results in an increase of EDA, which is highly correlated with a participant's emotional arousal (Bernstein, 1969; Greenwald, Cook, and Lang, 1989; Lang, 1993).

Electrodermal recordings can be used to measure tonic or phasic changes. The tonic activity level reflects arousal and attention over time (Hugdahl, 1995) and represents the baseline or range for the individual but vary from person to person. Phasic responses reflect both cognitive demands, such as changes in attention (Yaremko, 1970), and emotional demands, such as the viewing of unpleasant images (Bradley, Greenwald et al., 1993; Cook, Melamed, Cuthbert, McNeil, and Lang, 1988) and are seen as short term changes within the individual. As phasic responses can be influenced by changes in attention, EDR are sensitive to the novelty of the stimulus and task (Bradley, Lang, and Cuthbert, 1993). Therefore, Bradley (2000) presented positive, negative, and neutral images twice in a row. They found that SCR reached the same level for

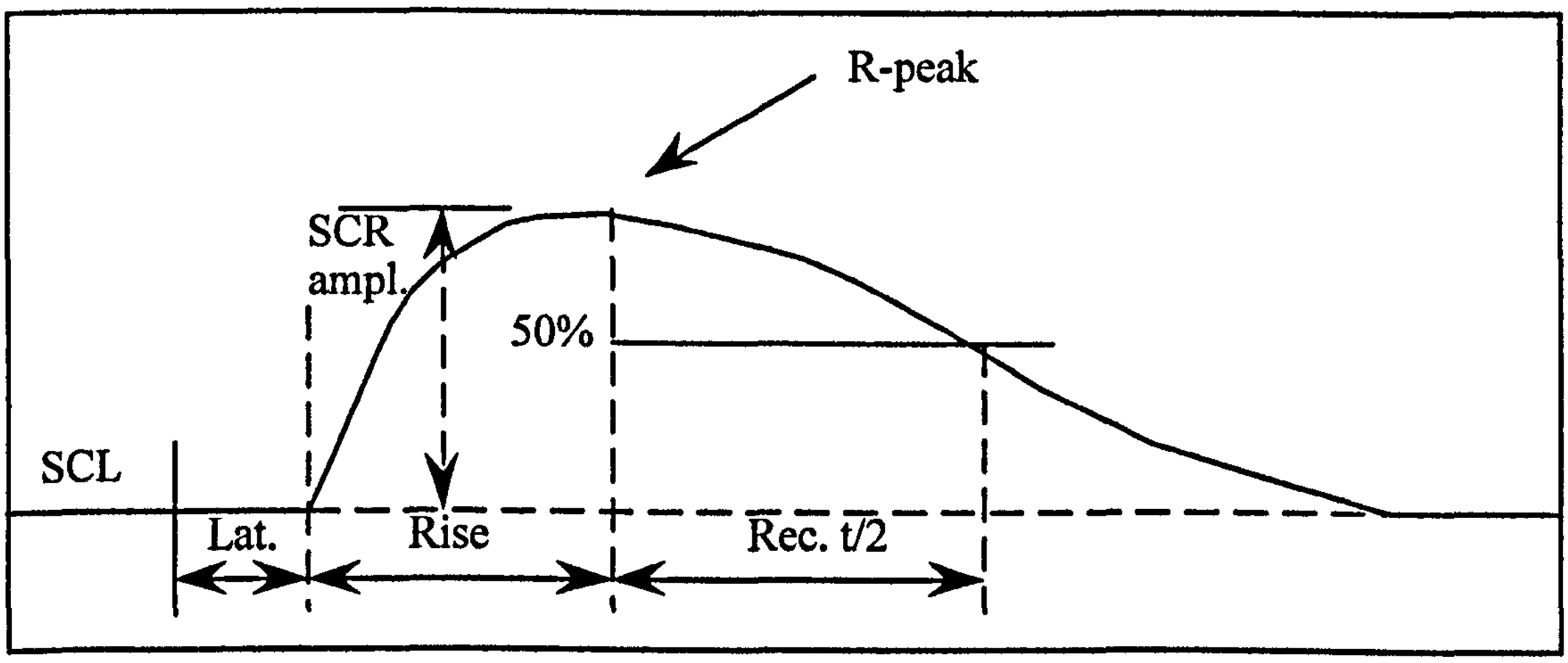
[3] The main aims of this thesis were to explore attention, arousal and emotional valence. As heart rate and EMG offer measures of each of these, due to time considerations just these two measures were analysed. It was felt that emotional valence was of primary importance within this thesis, and SCR does not measure this component.

unpleasant stimuli regardless, but there was a decline in response for pleasant stimuli. Investigating responses in this way allows novelty to be separated from emotion. The amount of skin conductance increases as arousal increases regardless of valence (Guyton and Hall, 1996), greater activity is associated with both highly pleasant and unpleasant images (Lang, 1993; Manning and Melchiori, 1974; Winton, Putnam, and Krauss, 1984). Males tend to be more responsive than females. However, as participants become familiar with the stimuli, they tend to show less reaction to it, this is called 'habituation'. Habituation to stimuli does occur within EDA; both tonic and phasic responses decrease with repeated presentations.

The experiments within this thesis employed endosomatic methods, measuring the potential between two points on the participant's skin (between the medial thalanx on the first finger and the medial thalanx on the second).

Figure 4-II shows how the electrodermal response is measured.

Figure 4-II: Measurement Parameters of a Phasic Electrodermal Response



S onset = Stimulus onset; R onset = initiation of a skin conductance response (SCR); SCR ampl. = amplitude of the response from the base level to response peak; lat. = response latency; Rise = rise time, the time from response to peak; and Rec t/2 = half-time recovery, the time to 50% recovery back to base level from response peak. (from Hugdahl, 1995 ; p.111).

4.5.3 ELECTROMYOGRAPHY

Facial displays of emotion are some of the most obvious emotional responses in everyday life, research suggests that some facial expressions evoke the same meaning across cultures (e.g., anger, happiness) (Ekman and Friesen, 1986). Facial electromyography (EMG) can be used to measure the muscular contractions underlying facial emotions. Neural activation of facial muscles releases neurotransmitters, which lead to muscle action potentials (MAPs),

which in turn activate the mechanism responsible for muscle contraction. EMG involves placing electrodes over muscles in the face to measure the electrical activity associated with muscle contractions (Tassinary and Cacioppo, 2000). Numerous studies have confirmed the validity and reliability of this methodology (Cacioppo, Petty, Losch, and Kim, 1986a; Dimberg, 1990). EMG is advantageous over observational studies because it can detect muscle movements that are not overtly visible, and the results are highly reliable. Studies have shown that EMG is most successful at differentiating between positive and negative emotions (Lang, 1993; Schwartz, Ahern, and Brown, 1979). There has been limited success identifying further emotions. Schwartz (1979) differentiated sadness from anger in a group of clinically depressed participants, but these data have not been reproduced. Fridlund, Schwartz and Fowler (1984) reliably differentiated between happiness, sadness, fear and anger on an individual basis, but this data could not be reliably extended to other individuals. Recently, disgust has been differentiated from other negative emotions (DeJong, Peters, and Vanderhallen, 2002)

There are two main types of electrodes used for EMG, needle and surface. Surface electrodes detect contraction of muscle groups beneath and near to the electrodes. The disadvantages of these are that it can be hard to target exact muscles. For example when measuring activation of the brow, they can detect muscles that lift the brow and muscles that knit the brow. These muscles are active for different emotions, knitting being negative and lifting indicating surprise. In addition, the use of adhesive collars and micropore tape can restrict movement and participants may feel uncomfortable and behave in different ways. Needle electrodes are inserted via a hair follicle through the skin into the muscle. As they are inserted directly into the muscle they do not restrict facial movements, they are also much more selective (muscle groups), sensitive to very small movements and produce less signal noise. However, on the negative side large movements can dislodge or relocate the electrodes. The procedure involved to fit them is invasive and a doctor with medical training may be required, participants are less likely to agree to take part in studies with needle electrodes and there is also a small chance of infection and some 'discomfort' on insertion and removal (Fridlund and Cacioppo, 1986).

The next sections look at three muscle sites commonly used with EMG, the zygomaticus major and corrugator supercilii as these allow negative and positive affect to be differentiated and the levator labii as this allows disgust to be differentiated from negative affect.

4.5.3.1 Zygomaticus Major

The zygomaticus major muscle is activated when the cheek is drawn back or tightened (Tassinary, Cacioppo, and Geen, 1989) for example when smiling. Activity in this muscle site increases with hedonic valence, and is greatest when viewing highly pleasant stimuli (Bradley and Lang, 1993; Schwartz et al., 1979). There is a linear relationship between valence and activation except when viewing very unpleasant stimuli, in which case there is a quadratic effect. Highly negative images are associated with an increase in the zygomaticus major muscle coupled with an increase in the corrugator supercilii muscle. Looking at gender, two thirds of females have a relationship between zygomaticus major activity and valence, whereas only a quarter of males have the same (Lang et al., 1993). It is thought that this is because women are more facially expressive than males (Bradley, Greenwald et al., 1993).

4.5.3.2 Corrugator Supercilii

The corrugator supercilii muscle is responsible for the lowering and contraction of the brows and can be considered an index of stress or negative affect (Ekman and Friesen, 1986). High levels of activity are expected in this site if the stimuli are unpleasant (Bradley, Greenwald et al., 1993; Ekman and Friesen, 1986; Schwartz et al., 1979). If the stimuli are neutral, low levels of activity are expected and if the stimuli are pleasant then activity is expected to drop below baseline (relaxation of the muscle). There is a linear relationship between the corrugator supercilii and the continuum pleasant to unpleasant (Lang, 1993).

4.5.3.3 Levator Labii

In addition to emotional valence (pleasant or unpleasant), EMG has been used to identify specific negative emotions such as disgust. The levator labii is a muscle in the upper lip and cheek, the nasal part raises the upper lip and wrinkles the nose, this muscle is sensitive to the expression of disgust (Vrana, 1993). When muscle tension in this site is coupled with tension in the corrugator supercilii but not the zygomaticus major, this represents disgust (Vrana, 1993).

4.6 Relevant Studies

This section addresses what psychophysiology can tell us about attitudes. At a very basic level attitudes are the evaluations given to objects, whether we perceive the object positively or negatively. In the early literature affect and evaluation were used interchangeably (Fishbein and Ajzen, 1975). Thurstone, (1931) defined attitudes as the affect for an object. However, Ajzen and

Fishbein (1980) noted that smokers' evaluative responses differed to their affective response, such that effectively there were indications that they liked smoking but they evaluated it negatively. This ties in with the literature discussed in Chapter 3 looking at whether it is possible to hold two attitudes and the difference between implicit and explicit attitudes. As a result, Summers (1970) suggested that measuring physiology allows the emotional component of the attitude to be observed.

A very simple study looked at the effects of colour on GSR (Wilson, 1966), they found increased responding to the colour red, and suggested that this represented cultural attitudes to colour (i.e., green; safe). An increase in skin conductance can also indicate a strong dislike for something. Rankin and Campbell (1955) found this effect in participants who had a strong dislike for their experimenters' race. A similar effect was found in a study by Cooper (1956), when he exposed participants to a racial comment that was contrary to their beliefs. Dickson and McGinnies (1966) employed a similar paradigm in relation to churches. Participants who supported a church displayed the largest GSR to anti-church statements, and participants who were against the church showed the largest GSR to pro-church statements. Gottlieb, Gleser and Gottschalk (1967) found that hypnotising participants and inducing an attitude in them, could alter their physiology. Participants who felt mistreated and ruminated about it displayed an increase in skin temperature, whereas participants who felt mistreated but wanted to strike back, had a decrease in skin temperature. Oskamp (1977) suggested that the degree of arousal may indicate the intensity of feelings, therefore the extremity of their attitudes.

Facial expressions may also give an indication of attitudes, Ekman Friesen and Ancoli (1990) effectively gauged how much participants liked a videotape by monitoring how much they smiled whilst watching it. EMG offers a more accurate way to assess this. Cacioppo, Petty, Losch and Kim (1986a) exposed participants to positive, negative and neutral images, they could not observe any facial expressions but the EMG data supplied information not only about the direction of their emotion to an image, but also about the intensity of that feeling. Cacioppo and Petty (1979), measured the facial muscle activity of subjects exposed to a persuasive communication. They found that a close link between psychophysiological data and their cognitive responses. Vanman, Paul, Ito and Miller (1997) used EMG to look at racial bias, they found that people explicitly reported a greater preference for Black people than White people but EMG activity indicated that they had a bias against Black people. One study (Vanman, Saltz, Nathan and Warren, 2004), explored the usefulness

of EMG as an implicit measure of preference. Examiners asked participants to select participants of different races for a teaching fellowship. They found that EMG (zygomaticus major) activity was related to the race of the chosen applicant whereas the IAT was not, however motivation was related to bias in the IAT.

These studies indicate that in terms of attitudes, when a strong opinion is held (particularly if it is challenged), that there is an increase in SCR. Also, studies examining EMG have found this to be a reliable indicator of positive versus negative emotions, as well as to indicate the strength of the attitudes, and even as a better predictor of implicit attitudes than the IAT. It would appear (from the studies discussed) that psychophysiology is closely related to affect and emotion.

4.7 OVERVIEW

This chapter has looked at psychophysiology and its usefulness in assessing emotional responses to a range of stimuli, particularly images. An overview of emotion has been explained and discussed in terms of how different components of psychophysiology can help to identify arousal, attention and valence. Heart rate is a way of assessing both the arousal and valence of a stimulus. EMG can identify negative and positive (and some discrete) emotions more accurately than heart rate but is less effective and reliable with male participants.

Chapter 5: METHODOLOGY

5.1 OVERVIEW OF METHODOLOGY

In order to avoid repetition within the thesis, this chapter outlines the different methodologies used within the thesis. Where the methodology differs from that described here, additional information will be given within the relevant chapter. Initially at experimental design, participant selection and ethics are looked at. This is followed by the individual difference and explicit measures employed before detailing the two main paradigms utilized within the thesis; the implicit association test (IAT), and the measurement of emotion using psychophysiological instrumentation.

5.1.1 EXPERIMENTAL DESIGN

There are four experiments within this thesis. Two of the studies (1 and 4; Chapters 6 and 9) explore responses to visible differences using all of the methodology detailed in this chapter; the IAT, explicit measures, psychophysiology and the SAM, and questionnaire measures. The remaining two studies (2 and 3; Chapter 7 and 8) use only a subcomponent (the IAT) to look at methodological issues.

5.1.2 SELECTION OF PARTICIPANTS

Undergraduates participated in studies 1 to 3. They were recruited via notice boards in University departments and by e-mail, in exchange for a choice of either course credit or money. Studies 2 and 3 required a specific breakdown in the sample (e.g., male/female) so participants were recruited according to certain criteria. Study 4 employed a clinical sample (recruited according to certain criteria) and age/gender matched controls recruited specifically to match the clinical population. In all studies (1-4), participants were randomly assigned to a condition upon sign up. All of the studies required participants to be able to speak English fluently, in order that they could understand the content of the tasks and due to the standardisation of the measures used.

5.1.3 ETHICAL CONSIDERATIONS

Studies 1-3 sought ethical approval from the University of Sheffield. Study 4 sought NHS ethical approval and research governance (see Appendix 1 for a copy of the approval letter). Information was given to the participants for each of the studies, either verbally or via briefing sheets (see Appendix 2); they then signed a consent sheet (Appendix 3). For Studies 1 and 4, participants were

informed upon arrival that they would see pictures of which 'some were mildly sexual in nature, whilst others were unpleasant and may include blood or mutilation'. They were also informed that the task could be stopped at any time if they wished. For each of the studies participants were told that they could leave the experiment at any time, without giving a reason, and that they would still receive the credit/payment if they did choose to leave. No participants chose to leave the experiment. All participants were debriefed, either verbally or by giving them a debrief sheet (Appendix 4).

5.2 PSYCHOLOGICAL VARIABLES

Of the following questionnaires only a small number were used in all four experiments as different measures were more pertinent to particular hypotheses and some questionnaires were eliminated or replaced when reviewed (see individual study chapters for further details). The questionnaires used within each study are stated within the corresponding chapter for ease of reference.

5.2.1 DISGUST, SHAME AND APPEARANCE CONCERN

In Chapter 2, psychological constructs relating to evolutionary theory (shame, disgust and appearance) were highlighted as potentially major factors in mediating reactions towards visible difference. Based on this, the following questionnaires were selected.

5.2.1.1 DISGUST SCALES

Scales were used to measure disgust, as the literature in Chapter 2 suggested that the disgust response might be one of the factors responsible for the attitudes and reactions people with a visible difference encounter. There are two scales frequently employed to measure disgust, the first of which breaks disgust into very specific situations (Haidt et al., 1994), and the second looks at disgust as a trait or sensitivity (Cavanagh and Davey, unpublished). Therefore, both were used initially in order to compare the results.

5.2.1.1.1 The Disgust Scale (Version 2)

Haidt, McCauley and Rozin (1994) first developed the disgust scale in 1994. The scale reliably measures seven domains of disgust elicitors; these are food, animals, body products, sex, body envelope violations, death and hygiene. In 2002 the scale was updated so that all of the items were scored on the same scale, this involved rewording some of the items so that they were phrased from a first person perspective. In addition, items that were consistently low on

validity were removed giving the scale consistently high internal and external reliability. The 15th item in the scale was reworded to make it understandable to a British population (this scale can be viewed in Appendix 5). Within this thesis, Cronbach alpha for this scale was .87.

5.2.1.1.2 Davey Disgust Scale

This scale was developed by Cavanagh and Davey (unpublished) to measure disgust in terms of sensitivity and trait (Appendix 6). Within this thesis, Cronbach alphas for the scale ranged from .78 to .88.

5.2.1.2 Appearance Schema Inventory Revised (ASI-R)

This scale was selected for use within the studies as research suggested (Chapter 2) that self-perception of appearance and self worth were related to how that person viewed others. Appearance was also related to evolutionary theories. This scale was developed by Cash and Labarge (1996) and contains 20 items. This scale produces two dimensions, self-evaluative salience and motivational salience, within general and clinical populations. It has good validity and reliability. Within the thesis, Cronbach alphas for the scale ranged from .85 to .9 (This scale is in Appendix 7).

5.2.1.3 Shame Scales

Chapter 2 discussed shame in relation to reactions to a visible difference and how people cope with a visible difference. Within the thesis three scales were used to measure shame, one for internal, one for external, and one which was introduced in Study 4 to measure skin specific shame.

5.2.1.3.1 Other as Shamer Scale (OAS)

This scale was employed because it is a measure of how people think others see them as a person, and is important to differentiate between the persons' view of themselves and how they believe that others view them. This scale was developed by Goss, Gilbert and Allan in 1994 to measure external shame (how the individual feels that others see them). The scale consists of 18 items, and was found to have high correlations with internal shame (how individuals see themselves) suggesting it measures the construct intended. Further studies (Allan, Gilbert, and Goss, 1994) have confirmed its reliability. The scale can be viewed in Appendix 8. Within this thesis, the Cronbach alpha for this scale was .92.

5.2.1.3.2 Internalised Shame Scale (ISS)

The ISS (Cook, 1994), measures internalised shame, using items highly correlated with the total score on the scale. The scale consists of 30 items, 24 measure shame and six measure self-esteem. The internal reliability and test-retest reliability of the ISS, as well as the convergent validity have been established. This scale complements the OAS and can be viewed in Appendix 9. Within this thesis, Cronbach alphas for this scale were .82 and .94.

5.2.1.3.3 Skin Shame Scale

This scale was used within the final study, it was produced to assess how much a skin condition impacts upon individuals' feelings of shame (Scott, 2004). This is a scale produced recently and as such has limited reliability and validity (Appendix 10). Within this thesis, Cronbach alpha for this scale was .93.

5.2.2 Measures of Psychological Distress

The scales included within this section are scales that were specifically used within Study 4 with the clinical population. These scales were included as people with skin conditions are more likely to feel depressed and have low quality of life, and these measures can influence their responses on other measures.

5.2.2.1 Hospital Anxiety And Depression Scale

This scale was developed by Zigmond and Snaith (1983). The scale measures anxiety and depression in clinical and non-clinical populations. The Hospital Anxiety and Depression Scale (HADS) has validation both in the UK and in many other countries (via translation). A recent review of more than 700 studies which employed the HADS (Bjelland, Dahl, Haug, and Neckelmann, 2002) has added additional support to its reliability and validity (Appendix 11). Within this thesis, the Cronbach alpha for this scale was .69 and .83.

5.2.2.2 Dermatology Life Quality Index (DLQI)

This scale was used in the final study to measure the impact of a skin condition on quality of life. It was developed by Finlay and Khan (1994), contains 10 questions and has been produced in over 38 languages. It has been used in many studies and has high reliability and validity (Lewis and Finlay, 2004). The scale can be viewed in Appendix 12. Within this thesis, Cronbach alpha for this scale was .85.

5.2.3 Measure of Motivation

5.2.3.1 Internal and External Motivation Scale

This Internal and External Motivation scale (IMS/EMS) was included because research looking at the IAT (see Chapter 3 for an overview; 3.6.1) suggested that motivation might affect responses both on the IAT and explicit measures. Several studies suggested that this might account for the differences in implicit and explicit attitudes.

This scale was developed by Plant and Devine (1998), and consists of ten items, which measure the participants internal (self beliefs or concepts) and external (social pressures) motivations to respond without prejudice to black people. The scale has been successfully adapted to measure prejudice with regard to; gender (Klonis and Devine, 2000), homosexuality (Lemm, 1999 cited in Amodio, Harmon-Jones and Devine, 2003), and obesity (Buswell and Devine, 2000). In all of these studies, the internal and external motivation showed independence (correlations in the region of -.11). The scale was adapted to measure motivation to respond without prejudice to skin conditions (this scale can be viewed in Appendix 13). Within this thesis, Cronbach alphas for this scale ranged from .77 to .85.

5.2.4 Questionnaire Analysis

Scoring of the questionnaires was according to published criteria, or where this was unavailable, the author's instructions. All data were screened for outliers using box plots and *z* scores, tests for normality were conducted.

5.3 Explicit Measures

These scales were used in all four experiments within the thesis to look at explicit attitudes and personal experiences.

5.3.1 Feeling Thermometer

In line with previous IAT research, participants were asked to complete a feeling thermometer asking how they felt towards people with skin conditions and how they felt towards people with clear skin. The thermometer was on a valence scale of 1 (extremely negative) to 9 (extremely positive). This differs to the scale used by Grandfield et al. (2005) as participants did not use the full range of scores available to them using only intervals such as 50, 25 and 0 (Appendix 14). In line with previous research the ratings given on the thermometer scale for attitudes to people without a skin condition were subtracted from the ratings

given on the same scale for attitudes to people with a skin condition, therefore a positive score equates to a preference for clear skin

5.3.2 Semantic Differential

This consisted of five Likert scales (as employed in many studies e.g., Bradley and Lang, 1994) asking how participants felt about people with skin conditions and people with clear skin on different dimensions (e.g., unpleasant – pleasant). Each scale had seven points, 4 being neutral (Appendix 14). In a similar manner to the thermometer scales, the scores from the semantic differentials were totalled within each group (skin conditions and clear skin) across all five parameters then the skin condition group was subtracted from the group with clear skin producing a single measure, again a positive score indicated a preference for clear skin.

5.3.3 Demographic Variables

Participants were asked questions regarding their own experiences of skin conditions, such as whether they have personally experienced a skin condition, whether anyone close to them has, how long the condition lasted for (Appendix 15). These questions were asked verbally so that a full understanding of the participants' answers could be gained. Participants were also asked to report their age and sex.

5.4 The Implicit Association Test

The Implicit Association Test (IAT) was used in each of the four experiments, though some variations were implemented (described in detail within the appropriate chapter). This section outlines the methodology employed in the use of the IAT.

5.4.1 Target Stimuli (Skin Condition / Clear Skin)

The stimuli used within the IAT were seven pictures of women with skin conditions (Figure 5-I; pictures were taken from (Diepgen, Yihune, and et al, 2003), and seven pictures of women with clear skin (Figure 5-II). In total, there were 28 images to allow for counterbalancing within the experimental conditions. Pictures were counterbalanced between the IAT and the psychophysiology task. The pictures of skin conditions were selected on the criteria that there was a visible skin condition affecting the facial area and that the images were of females. The images of clear skin were taken specifically for this research following the criteria that they represent a female population. The

women who have allowed their photograph to be used have signed a consent form. The photographs were edited using Paint and Microsoft Photo Editor to ensure they were all the same height (84 mm) and had matching black rectangles obscuring their eyes, also to save on computing resources the images were all scaled to 110 pixels per inch (ppi).

Figure 5-I: Examples of Pictures Used (Skin Conditions)

Figure 5-II: Examples of Pictures Used (Clear Skin)

Initially 60 pictures (30 from each condition) were rated by an undergraduate sample on 5 point Likert scales for attractiveness and severity of skin condition (Appendix 16). Pairs of photographs were matched according to the perceived severity of the skin condition and their attractiveness; images in the clear skin group perceived as having a skin condition were removed. The difference in severity and attractiveness between each pair of pictures depicting skin conditions was less than 0.08 on the Likert scales. The difference in attractiveness between the control pictures was less than 0.1 on the Likert scales. From these pairs, four sets of seven pictures were collated (two sets of clear skin and two sets of skin conditions); t-tests were conducted to ensure that each set of seven pictures (either clear skin or skin conditions) were not significantly different (Appendix 17) on attractiveness ratings. There were a range of skin conditions; no more than two photographs depicted the same

condition (Appendix 18). Evidence suggests that the IAT is fairly robust to small differences within groups (Mitchell et al., 2003). For example, if the pictures within a group are representative of a skin condition, variations in age should not affect the results. An additional 10 pictures (five from each group) were set aside for the recall task (described later). The final complete sets of photographs can be viewed in Appendix 19 (skin conditions) and Appendix 20 (clear skin).

It was important that the groups were only differing on the intended dimension and not an additional measure, for example if measuring racial associations there should be either only one gender used, or males and females should be distributed across both groups, one group should not contain only males and the other only females (Steffens and Plewe, 2001). Bearing these constraints in mind differences between stimuli were kept minimal by selecting images of neutral looking faces and using females.

5.4.2 Attribute Stimuli (Pleasant / Unpleasant)

For attribute stimuli, seven pleasant words were used; 'pure', 'sincere', 'funny', 'polite', 'good', 'happy' (taken from DeHouwer, 2001, due to them being used within the UK) and 'paradise' (taken from Bellezza, Greenwald, and Banaji, 1986, in order that the syllable lengths of words could be matched between groups) and seven unpleasant words, these were; 'aggressive', 'mean', 'brutal', 'bad', 'ugly', 'angry' (DeHouwer, 2001) and 'vomit' (Bellezza et al., 1986). Words were displayed in a black comic sans font on a white background. These words were also implemented by Grandfield et al. (2005).

5.4.3 Equipment

The IAT was produced and run using the software Psyscope (2000) on an Apple Macintosh, based on the script used by Grandfield et al. (2005).

5.4.4 Design and Procedure

Participants were presented with written instructions on the computer screen at the beginning of the task and between each section (Appendix 21). The instructions explained that the participant would be asked to categorise the items they saw on the screen, telling them where the categories and pictures would be displayed and explaining the key assignments to them.

Table 5-I shows the five phases within the IAT, this is based on the original design by Greenwald et al. (1998). The first phase consisted of all seven

pleasant words and all seven unpleasant words being presented twice. The second phase consisted of all 14 pictures being presented twice. In the third phase, all 28-stimulus items (words and pictures) were presented four times in two separate blocks of 28 trials. The fourth and fifth phases were identical to the second and third phases respectively, except that the response assignments for the images were reversed. All of the stimuli were presented randomly.

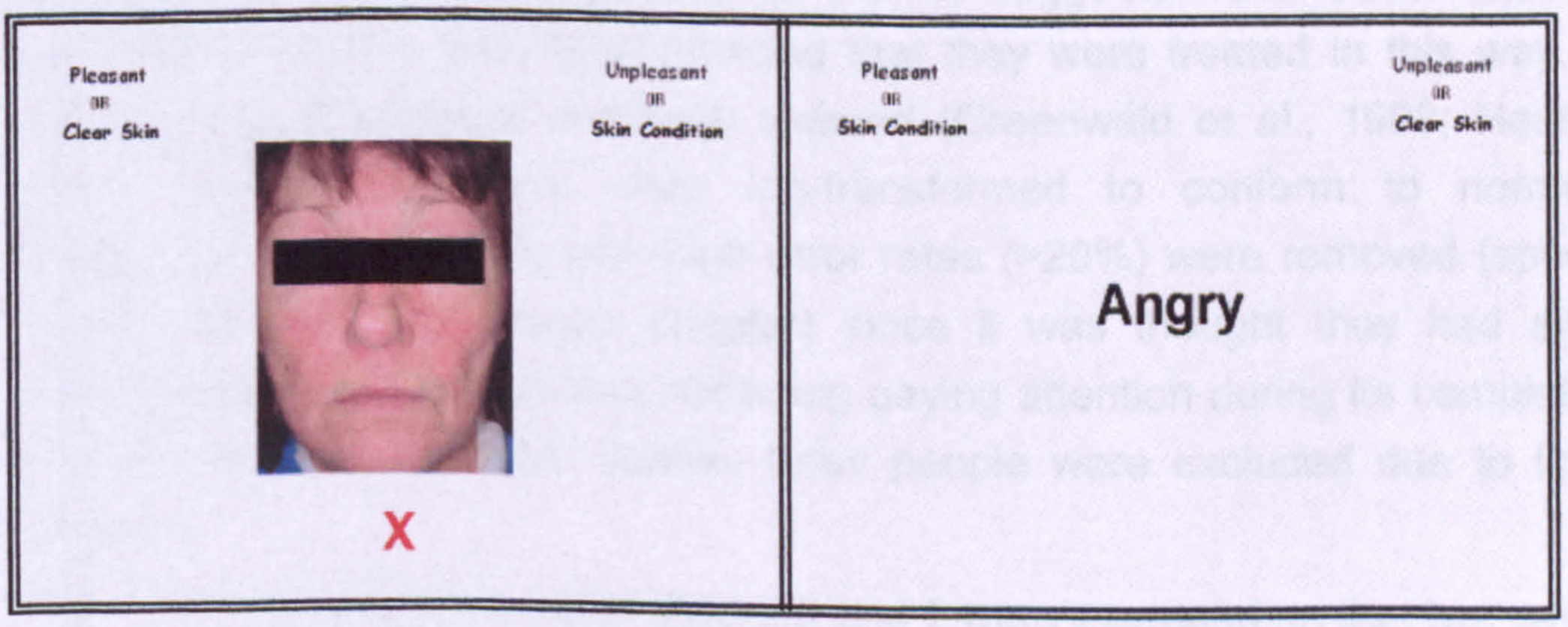
Table 5-I: How Participants were asked to Categorise Stimuli

Phase	Judgement	Left Key (A)	Right Key (5)
1	Word categorisation	Pleasant	Unpleasant
2	Picture Categorisation	Clear Skin	Skin Condition
3	Hypothesised Congruent Condition	Pleasant or Clear Skin	Unpleasant or Skin Condition
4	Reversed Picture Categorisation	Skin Condition	Clear Skin
5	Hypothesised Incongruent Condition	Pleasant or Skin Condition	Unpleasant or Clear Skin

N.B.: In half of the trials, blocks 2 and 3 were swapped with blocks 4 and 5.

The stimuli were presented in the centre of a white screen, all words were presented in black (Figure 5-III). For the duration of the experiment the name of the concept presented in the top left corner of the screen (e.g., clear skin) was assigned to the left key and the concept presented in the top right corner of the screen (e.g., skin condition) was allocated to the right key. These were presented in identical size and font to the attribute stimuli (pleasant/unpleasant). Participants responded to the stimuli by either pressing 'E' to indicate left or 'I' to indicate right on a QUERTY keyboard. In order that participants could easily see which keys to press the E and I keys were white on a black keyed keyboard

Figure 5-III Screenshots – Phase 3 (congruent) and 5 (incongruent).



Throughout the five phases, pleasant words were always assigned to the left-hand side of the screen and thus the left key ('E'). The right-hand side of the screen and the right key ('I') were always assigned to unpleasant words. Greenwald et al. (1998) found that step 3 shows much faster response times and less errors than step 5 therefore this is best accommodated by counterbalancing their order. Therefore, half of the participants were assigned the left key for skin condition and the right key for clear skin in phases 2 and 3 then the right key for skin condition and the left key for clear skin in phases 4 and 5. The other half of the participants had the reverse of this.

Stimuli remained on the screen until the participant gave a correct response whereby there was a 30ms gap before the next stimulus was presented. If there was an incorrect response (the participant inaccurately categorised a pleasant word as unpleasant, a negative word as pleasant, a person with a skin condition as having clear skin or a person who has clear skin as having a skin condition) a red 'X' appeared beneath the stimulus and remained there until the correct response was given.

After all of the phases were completed, participants were asked (via the computer) the demographic and explicit questions stated above. A printed debrief sheet was given to every participant, which included an e-mail address in case they had any questions at a future time (for an example see Appendix 4). On average the IAT took 15 minutes to complete.

5.4.5 Data Quantification

In line with Greenwald et al. (1998) the data from the practice trial of blocks 3 and 5 were discarded, these tended to have higher error rates and longer latencies whilst participants practised the task. Any reaction times greater than 3000ms were recoded to 3000ms and any latencies faster than 300ms were recoded to 300ms. Greenwald et al. (1998) suggested that these latencies represented errors, and recommended that they were treated in this way. As IAT reaction times were positively skewed (Greenwald et al., 1998; Heiman, 1998; Miller, 1991) they were log-transformed to conform to normality assumptions. Participants with high error rates (>20%) were removed (specific details reported within each chapter) since it was thought they had either misunderstood the task or had not being paying attention during its completion. In total throughout all four studies three people were excluded due to these reasons.

The remaining latencies within blocks 3 and 5 were averaged so that two sets of

data were produced; congruent and incongruent. Each set contained the reaction times to the unpleasant, pleasant, skin condition and clear skin stimuli. The former being when pleasant words were presented with clear skin and unpleasant words with skin condition and the latter being pleasant words with skin condition and unpleasant words with clear skin. The mean response latency for the congruent block was subtracted from the mean response latency for the incongruent block. Therefore, positive scores indicated greater negativity to people with a skin condition.

5.4.5.1 Alternative Analysis

The analysis described above follows guidelines set by Greenwald et al. (1998). Implemented within the design of the IAT were practice blocks during which the participant typically made a large number of mistakes with longer reaction times as they were learning how to respond to the IAT. These blocks were eliminated from the analysis, alongside suggestions of how to treat extreme latencies and the error penalty to add to incorrect responses. In 2003, Greenwald et al. produced an 'improved scoring algorithm' this was based on multiple analyses of their web data, which consisted of hundreds of thousands of results. The criteria under which they produced the new algorithm was that the implicit measure had a higher correlation with the explicit measure. In order to explore the effects of the different forms of analysis both were implemented to explore the IAT data in Study 1.

The new analysis suggested by Greenwald et al. (2003) requires all of the data to be used except in the two blocks (1 and 4) where either pictures or words are shown by themselves. Any latencies longer than 10,000ms should be eliminated, as should participants who have more than 10% of their total responses faster than 300ms. All other values are left intact including latencies larger than 3000ms. The data are not log-transformed, the mean and standard deviation of the correct latencies within each block are calculated. Any errors can either be replaced with a) total error time, b) the block mean plus 600ms or c) the block mean divided by 2 then multiplied by the block standard deviation. After these calculations all four blocks are averaged. Block 3 is subtracted from block 6, and block 4 is subtracted from block 7. Each difference is then divided by the blocks standard deviation and the two quotients are averaged. Table 5-II shows the data used within the new and old analysis.

Table 5-II: Data Used Within Each Analysis

Block	No. of Items	Judgement	Old Analysis 1998	New Analysis 2003
1	14	Word Categorisation	None	None
2	14	Picture Categorisation	None	None
3	28	Congruent Condition	None	All
4	56	Congruent Condition	2nd showing (28)	All
5	14	Reversed Picture Categorisation	None	None
6	28	Incongruent Condition	None	All
7	56	Incongruent Condition	2nd showing (28)	All

Analyses showed a significant correlation between the old and new IAT (r=.61). Pearson's correlations with the explicit measures were not significant and ranged from -.12 to +.12. One-way ANOVA's failed to find an effect of knowing someone, personally experiencing a skin condition or gender on either of the IAT measures. As the differences between the two measures were minimal, it was decided that for consistency and ease of reporting, the original method of analysis (Greenwald et al., 1998) would be used throughout the thesis.

In terms of error latencies there has been wide debate regarding whether participants should be penalised at all. Effects of error latencies were looked at for both the new and old forms of analysis. In order to gain a full picture of the effects, the results were recalculated with error latencies ranging from 0ms to 1000ms in increments of 100ms. There were no significant differences between the measures. The lack of difference was likely to be due to the low amount of overall errors within the dataset and the transformations to the data that occured after error penalties have been implemented. In light of this, no analyses within the thesis have error penalties incurred, in order to be representative of Grandfield et al. (2005) study. It seems that as most of the mistakes occurred within the incongruent or practice sections, adding further penalties would further support the trend looked for. This seems biased, indeed a recent study (Nosek, Greenwald, and Banaji, 2005) indicates that adding additional practice trials (rather than removing them) reduces effects of block order. A penalty was added if someone made a mistake, therefore elongating the reaction time, as mistakes were more likely to be made when the condition was incongruent, incurring a penalty helps to support the hypothesis.

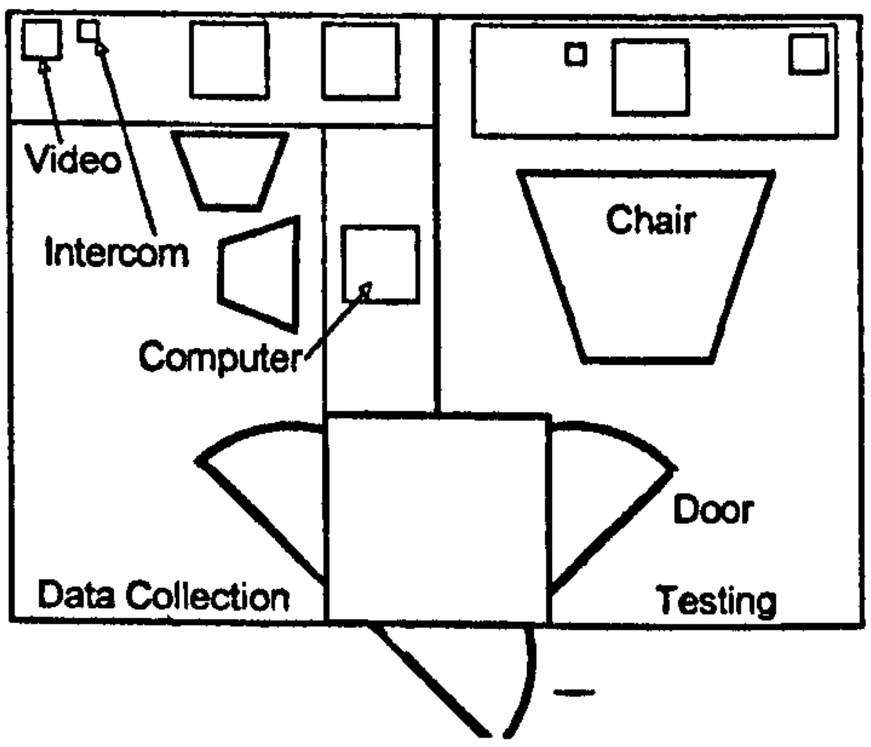
5.5 PSYCHOPHYSIOLOGY

Psychophysiological measures were used in studies 1 and 4.

5.5.1 SETTING

Psychophysiology was carried out in a specially designed environment. The psychophysiology laboratory comprises of two neighbouring, sound attenuated rooms, both 3.6m by 2.6m.

Figure 5-IV: Plan of Experimental Room (not to scale)

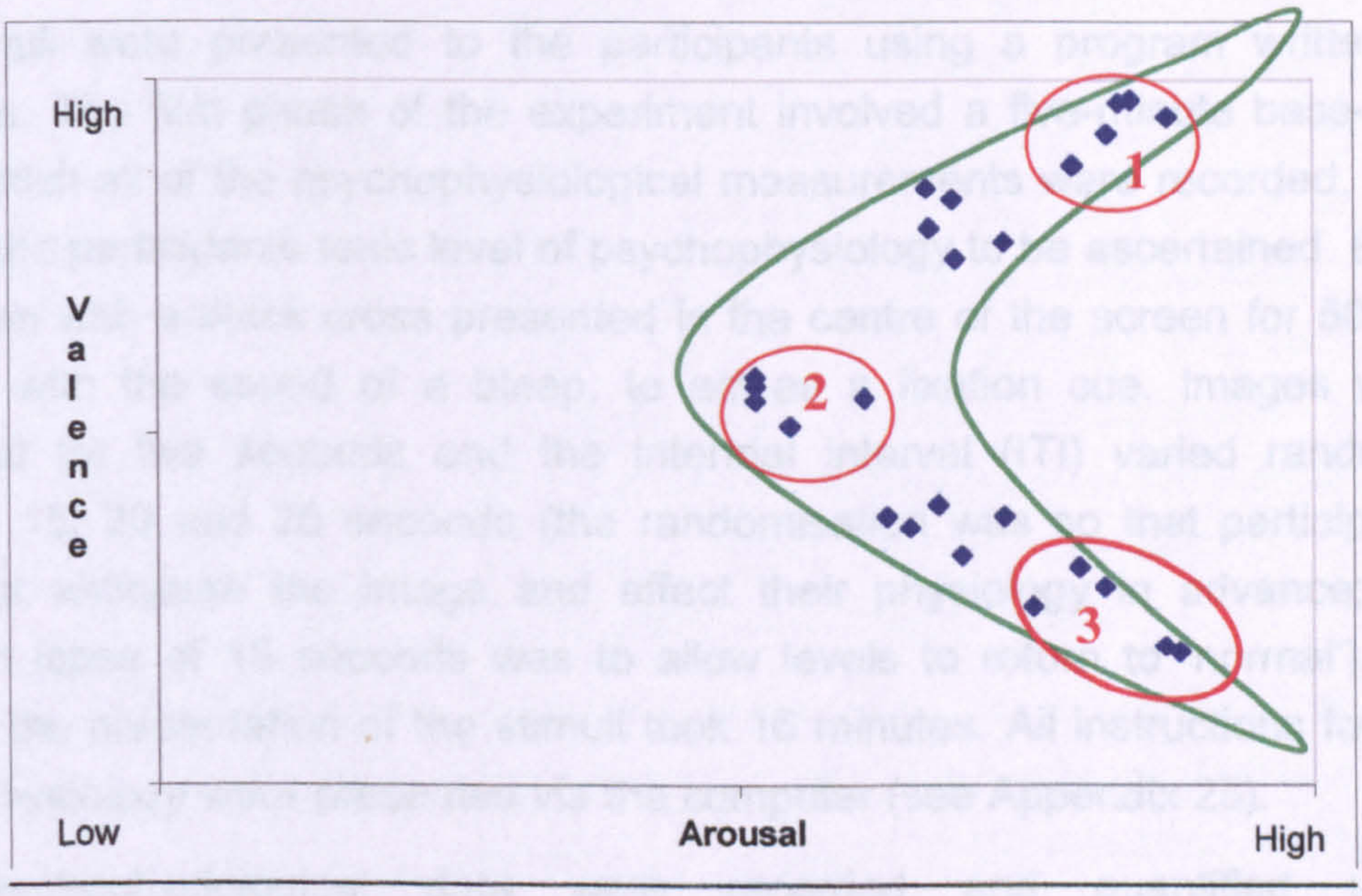


Entry to the rooms was via a small entryway with the data collection room to the left and the testing room to the right. In order to avoid distracting the subject thus creating false psychophysiological responses, data was monitored by the experimenter in the data collection room whilst the participant sat in the testing room. Data was passed from the testing room to the data collection room via cables running through the wall. A Sony video camera connected to an APF monitor enabled the experimenter to see the participant during the experiment and a two-way intercom (model MIC 404) allowed the participant to communicate with the experimenter. The test room temperature ranged between 22°C and 24°C. Participants were seated in a semi reclining Parker Knoll easy chair.

5.5.2 STIMULI

In addition to the pictures of clear skin and skin conditions mentioned above (5.4.1) the physiological measures also use images from the International Affective Picture System (IAPS; Appendix 22) (Lang et al., 1988), developed in the USA, to provide a standardised set of visual imagery to compare the data from the images to. As noted in Chapter 4 (4.4), the ratings for images in the IAPS tend to fall in a boomerang shape. In Figure 5-V the green shape represents the boomerang of image dispersal.

Figure 5-V: Images Plotted in Affective Space



Bradley and Lang (1994) recommended that images are selected from a minimum of three areas and if possible from five, the blue diamonds represent these areas. As the IAPS images needed to be compared with images of people with skin conditions and people with clear skin, images were selected from just three areas in order to minimise total participation time. These areas were; (indicated by red circles) highly pleasant and highly arousing (1), neutral and minimally arousing (2) and highly unpleasant and highly arousing (3), these are referred to throughout the thesis as positive, neutral and negative, respectively. These images were selected because they had also been rated by a UK sample (Bywaters, Andrade, and Turpin, 2004), differences between the UK and USA ratings were not significant. Appendix 23 gives the corresponding IAPS numbers for the stimuli.

5.5.2.1 Counterbalancing within Psychophysiology

The stimuli in this part of the experiment consisted of 25 images, five highly arousing and positive, five neutral and minimally arousing, five negative and highly arousing, five depicting skin conditions and five depicting clear skin. In order to allow for grouping effects a Latin square design was employed, whereby one image from each group was collated to form a new set of five images. Therefore, each participant saw five blocks, every block contained an image from each stimuli type. The images within the blocks and the blocks themselves were presented randomly. Appendix 24 shows the blocks and all five possible configurations.

5.5.2.2 THE COMPUTER TASK

The stimuli were presented to the participants using a program written in Psyscope. The first phase of the experiment involved a five-minute base-line, during which all of the psychophysiological measurements were recorded. This allowed the participants tonic level of psychophysiology to be ascertained. Each trial began with a black cross presented in the centre of the screen for 500ms together with the sound of a bleep, to act as a fixation cue. Images were presented for five seconds and the intertrial interval (ITI) varied randomly between 15, 20 and 25 seconds (the randomisation was so that participants could not anticipate the image and affect their physiology in advance; the minimum lapse of 15 seconds was to allow levels to return to 'normal'). On average the presentation of the stimuli took 16 minutes. All instructions for the psychophysiology were presented via the computer (see Appendix 25).

The psychophysiological data were recorded and quantified using Acqknowledge software. Raw psychophysiological scores were converted into numerical form using a purpose written programme.

5.5.2.3 BASELINE DATA

Analysis of the data within the experiments compares the values pre stimulus onset, with the values post stimulus onset. Therefore, mean values for five seconds prior to stimulus onset were calculated for each stimulus for each person, and compared to data post stimulus onset. This data was then combined for stimulus groups (clear skin, skin condition, positive, negative and neutral), so that differences could be looked for.

5.5.3 PSYCHOPHYSIOLOGICAL RECORDING

5.5.3.1 HEART RATE

Heart rate was measured within these experiments using an electrocardiogram (ECG), this measured changes in pressure in the blood, these arise from the ejection of blood into closed circulation. This was done by recording the electrical signals generated by action potential conduction through the myocardium during the cardiac cycle. Heart rate was derived by measuring the interbeat interval and converting it to BPM. Heart rate waveforms consist of an initial P wave representing atrial contractions followed by a QRS complex representing ventrical contractions (Hugdahl, 1995). The R wave is the most pronounced event in the cardiac cycle so measuring the difference between R waves gives an accurate measurement of BPM (albeit from the centre of the

cardiac cycle). The R peak is measured when the left ventricle contracts to pump oxygenated blood round the body. The R-wave was measured on line during the experiment using a setting on the ECG amplifier. This consisted of a 17 Hz band pass filter followed by a full wave rectifier, followed by a 7.2 Hz, two pole, low pass filter. The R wave was sampled at 1000 Hz. In the present studies, conversion from R-wave to BPM was done automatically using Acqknowledge software, using a noise reduction of 2% and high and low cut-off points of 140 and 50 BPM. These values were chosen in an attempt to reduce artefactual heart rate activity and in line with previous research conducted in the department (Bywaters, 2004; Harrison, 1998). For an overview of how to convert the R-wave to BPM mathematically, see Papillo (1990).

In these studies ECG plate electrodes were used to record ECG activity. Forearms were cleaned using alcohol then an ECG electrode gel (Dracard) was used as an electrolyte. The electrodes were applied to the forearms and held in place with rubber strapping. A ground electrode was unnecessary as the skin conductance served as a common ground for all of the measures.

5.5.3.1.1 Heart Rate Data Quantification:

Initially all data files were screened visually for movement artefact and any participants with excessive noise or signals that did not represent heart rate were removed. Data files were scrutinised for erroneous data, if this occurred either the data for that particular image was removed or mean values put in place of the outlier. The minimum and maximum values were also examined for all data files, on occasion the software failed to pick up a beat, when this occurred (n=6) these figures were averaged. Acqknowledge software was used to resample the data file at 100 samples a second, to reduce the size (data collected was sampled at 1000 per second). Cardiac measurement is constrained by the regular contractions of the heart so it can be examined either by looking at the data beat by beat or second by second; second by second analysis was used within this thesis since it gives a continuous estimate of cardiac activity (see Turpin, 1985). A purpose written program selected the heart rate activity (BPM) recorded 10 seconds prior to stimulus onset and 10 seconds post stimulus onset (five seconds were viewing time). The program transformed the data into second by second heart rate (BPM), producing a continuous real time base of heart rate, which could then be compared to other parameters such as EMG (Turpin, 1985).

Average scores for each category set were calculated by averaging all five pictures within each category on a second by second basis, further analyses

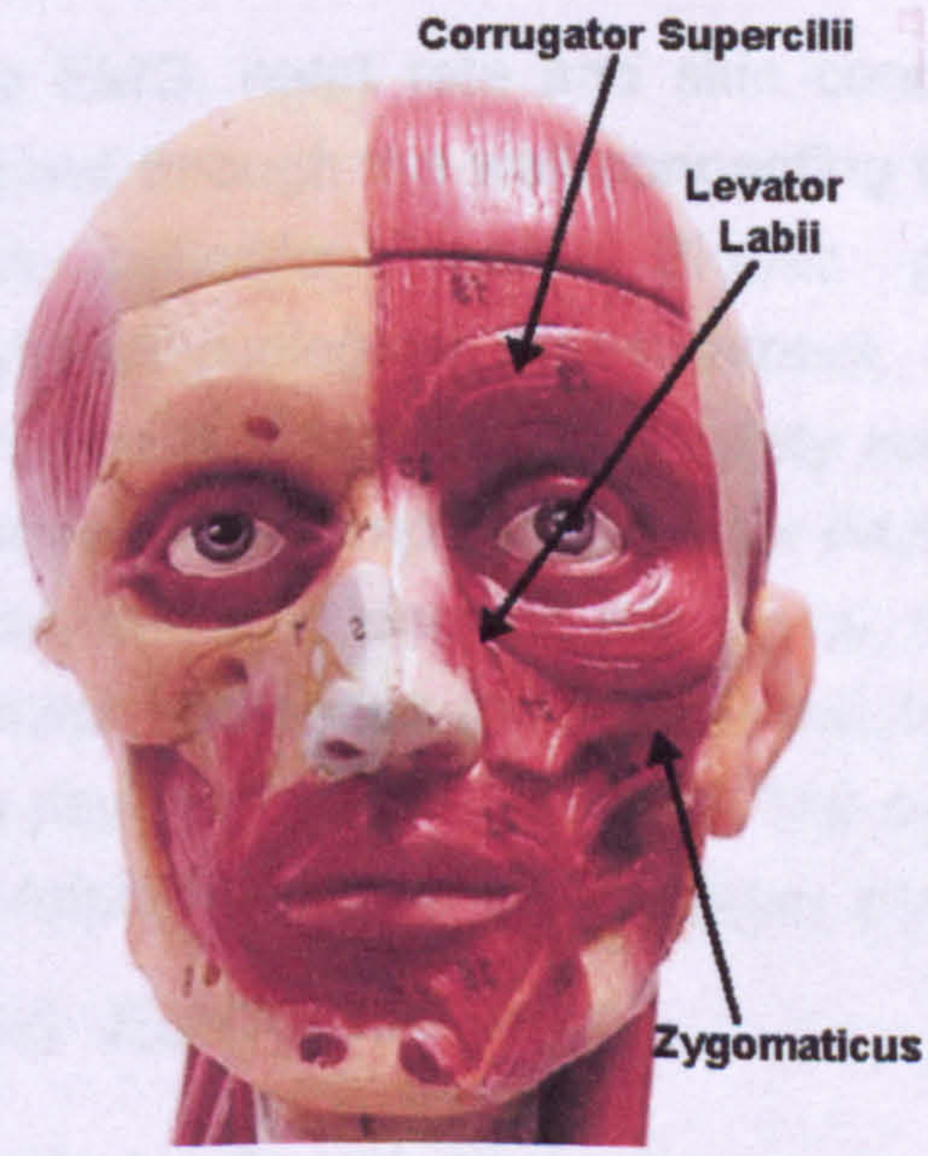
used this data.

Response parameter analysis (RPA; Turpin, 1986) was also employed where the lowest response time in the first three seconds, and the lowest response time in seconds five to eight was taken so that the orientating response could be compared with their later response, also having two continuous data values made a greater range of analyses possible.

5.5.3.2 ELECTROMYOGRAPHY

EMG activity was measured using two Ag/AgCl dome electrodes (ID 4 mm, OD 8 mm) for each muscle site (Figure 5-VI) zygomaticus major, corrugator supercilii and levator labii, positioned about 1½ cm apart as recommended by Fridlund and Cacioppo (1986) on the left hand side of the face. Data collected was the difference signal between the two electrodes. Skin was prepared for electrode placement by abrasion (abrasion reduces inter-electrode impedence) using Omniprep (an abrasive gel containing aluminium) with cotton buds. Each electrode was filled with Dracard gel and small adhesive collars were stuck to them in order to improve attachment to the face. Micropore tape was used to further secure the wires and ensure that they did not become entangled. Separate Biopac EMG100 amplifiers were used to record each of the EMG sites, using a sensitivity gain setting of x5000. Muscle tension was recorded in microvolts.

Figure 5-VI: Muscle Sites for Electrode Attachment



5.5.3.2.1 Electromyography Data Quantification

The signals from the EMG were rectified followed by a 10 Hz, two pole, low

pass filter using the Acqknowledge software. Data was resampled to 100 samples a second. A purpose made program was employed to extract data from the EMG sites in a comparable way to heart rate. The muscle tension in microvolts was calculated for each of the facial EMG channels (zygomaticus major, corrugator supercilii and levator labii) for the entire time of viewing the IAPS slides. The responses for the five seconds prior to stimulus onset were calculated and used as baseline data. The value for each second was subtracted from the baseline data to create second by second change scores during viewing and post stimulus. Similar to heart rate, these were then averaged so that total scores for each category were acquired.

5.5.3.3 Electrodermal Activity (EDA)

Endosomatic methods were employed within this thesis to measure EDA. Skin conductance was measured using two Ag/AgCl dome electrodes (ID 4 mm, OD 10 mm) placed on the middle phalanx of the forefinger and middle finger of the non-preferred hand. A purpose made gel (0.05m NaCl in a methyl cellulose base) was used as an electrolyte (see Grey and Smith, 1984, but also Clements, 1989) filling the electrodes. These were attached to the palmar surface of the medial phalanx of the forefinger and middle finger using adhesive collars and micropore tape (to reduce movement artefacts). A constant voltage of 0.5v was applied across the electrodes.

5.5.4 Psychophysiological Equipment

The EMG, heart rate and skin conductance signals were relayed via cables passed through the wall connecting the junction box to Biopac amplifiers in the data collection room. Biopac provide separate amplifiers for each psychophysiological measurement, these amplifiers were all connected via serial ports. For participant safety each amplifier was optically isolated. In total, there were six amplifiers, one for each of the EMG signals, one for SCR, one for heart rate and one for the digital signal. The digital signal is attached to a monitor and allows the images displayed for the participant to be matched with the psychophysiological data. The data from the amplifiers was then passed to an Apple Macintosh G4 computer and recorded by the software Acqknowledge.

5.5.5 Electrode Care

Newly purchased electrodes were used for the first experiment. Prior to the fourth study, the electrodes were re-chlorided to ensure accurate readings. Following completion of each experiment the Ag-AgCl electrodes were cleared

of any residual gel using cotton buds and cleaned with washing up liquid, hot water and a toothbrush. Electrodes were stored connected together, using two 2 mm sockets and a lead, and soaked in 0.05 NaCl solution for at least one hour prior to use. This procedure reduces bias potential arising from polarisation.

5.5.6 PSYCHOPHYSIOLOGICAL PROCEDURE

The participant entered the psychophysiology laboratory in the psychology department. They were asked to remove outerwear. After sitting down, the experimenter pointed out the video camera and intercom to the participant telling them that they could communicate with them at any time by pressing a button and that they were not being recorded by the video camera. Next the participant was given the hypoallergenic soap free handwash and asked to wash their hands and remove any jewellery from their hands or wrists. The electrodes were then attached to the participant following the description outlined above (5.5.3) in this order; heart rate, skin conductance, EMG (levator labii, zygomaticus major, corrugator supercilii). Once the electrodes were secure and the participant was comfortable they were asked to take a breath in order to ensure that the computer was reading their physiology. Then the program containing the psychophysiology task was started and the participant left alone with the door closed for the duration of the program. At all times the safety and comfort of the participant was paramount and they were asked how they were feeling and if they had any questions. After the experiment had finished, all electrodes were removed, hypoallergenic wet wipes were used to clean the areas where the electrodes had been. Participants were given the option of washing their hands and were given a mirror to check their appearance.

5.6 SELF ASSESSMENT MANNEQUIN

Following the psychophysiology, participants were asked to complete the SAM for each image (see 4:4 and Appendix 26). The SAM was developed on a nine-point Likert scale, however, studies suggest that only five of the points, namely those directly corresponding to pictures are used (e.g., Bywaters et al., 2004). Therefore, the scale was condensed into a five-point scale in the same manner as Bradley, Greenwald, Petry, and Lang, (1992). The SAM allowed representivity of the images from the IAPS to be ascertained.

5.6.1 STIMULI

The images used within the SAM were identical to those used in the psychophysiology task (5.5.2). In order to ensure that participants had been paying attention during the psychophysiology, a recall element was incorporated in the task; 10 additional images were added (see Appendices 19 and 20), participants were asked to say if they had seen the picture within earlier tasks.

5.6.2 DESIGN

This task was designed and run using Psyscope (2000) on an Apple Mac computer (described above, 5.4). Each picture was displayed in the top centre of the screen and the rating scales were displayed underneath (Appendix 27). The program prompted the participant to rate each picture for valence and arousal on the SAM (4.4), this was done by pressing the corresponding number and then return/enter. After rating the SAM each participant was asked to rate each picture according to how attractive they thought the person depicted was and the severity of their skin condition (Appendix 27). Finally participants were asked if they saw the image in one of the earlier tasks. All of the rating scales were counterbalanced and randomised such that the most positive attribute may have been at the beginning or the end (Appendix 26). Instructions for this task can be seen in Appendix 28.

5.6.2.1 SELF ASSESSMENT MANNEQUIN DATA QUANTIFICATION

Data from the SAM tasks was looked at according to category (positive, negative, neutral, skin condition and clear skin) the average score given on each of the categories was looked at, to see how they fitted in affective space. ANOVAs ascertained whether differences in the groups were significant. Attractiveness and severity of skin condition were also analysed to check for differences between the four sets of stimuli.

5.7 POWER ANALYSIS

In order to conduct the power analysis, consideration was given to the measures in use and the proposed analysis for each of these. All analyses were performed using .05 as the significance level.

Power analyses were completed with G-power (Faul, Erdfelder, Lang, and Buchner, in press) to ensure that an adequate number of participants were recruited. All analyses required a medium to large effect size with significance

at the .05 level. The IAT requires t-tests and ANOVAs (as recommended by Greenwald et al., 1998), therefore G-power was used to calculate the most appropriate sample size. For a large effect size (as shown in the pilot study), a sample of 40 participants would be necessary to ensure that there was minimal risk of a type two error.

It was anticipated that a hierarchical regression would be used to assess whether any of the individual difference scales or demographic variables were factors contributing to the results found in either the IAT or the psychophysiological measurements; for a medium to large effect size (.8) G-power recommended 48 participants. Therefore, a sample size of between 38 and 48 participants were needed.

Studies 2 and 3 employed the IAT so a minimum of 38 participants were required for these studies with at least 20 participants in each group (as recommended by Greenwald and Nosek (2001)). Study 4 employed identical measures to Study 1 so the participants numbers required were the same.

5.8 Chapter Overview

This chapter has looked in detail at the two main paradigms examined within this thesis, the IAT and the psychophysiology. It has also looked at the individual differences that represent components of evolutionary theories that may be pertinent to understanding responses to people with a visible difference. The next chapter is the first experimental study.

Chapter 6: Study 1; Implicit and Explicit Attitudinal Responses, and Psychophysiological Reactions to Skin Conditions

6.1 Introduction

Over 20% of the UK population are personally affected by skin conditions (Trust and Trust, 2003). People with skin conditions are often adversely affected psychologically (Neil, 2001), experiencing increased anxiety (Kellett and Gawkrodger, 1999; Kent and Thompson, 2003), depressed mood (Kent and Thompson, 2003), suicidal thoughts (Gupta et al., 1993), self consciousness (Marks et al., 1999), decreased self confidence (Kent and Thompson, 2003; Thompson and Kent, 2001), difficulty forming relationships, (Lannigan and Cotterill, 1989) and many have negative beliefs about their appearance (Papadopoulos et al., 1999). Some skin conditions can be adversely affected by stress and anxiety (Kellett and Gilbert, 2001; Papadopoulos, 1998; Papadopoulos et al., 1999; Scharloo et al., 2000; Thompson, 2005). Therefore improving psychological well-being may lead to an actual improvement in the severity of the skin condition (Linnet and Jemec, 2001) and also in the patients perception of the severity, which has been shown not to map on to actual severity (Papadopoulos and Walker, 2005).

Reports from people with visible differences and skin conditions indicate that they attribute many of their difficulties to social situations and the negativity they feel from others (Bull and David, 1986; Clarke, 1999; Heason and Kent, 2001; Kent, 2000; Porter et al., 1990; Thompson et al., 2002), and that they are affected most when the skin condition affects visible areas (Fortune et al., 2000; Kent and Keohane, 2001). There is a large body of literature ascertaining how individuals with a visible difference perceive others reactions (e.g., Bull and David, 1986; Heason and Kent, 2001; Kent, 2000; Thompson et al., 2002) and research observing how the 'normal' population behaves towards people with a visible difference (e.g., Bull et al., 1981; Kerr et al., 1985; Rumsey et al., 1982; Samerotte and Harris, 1976), but very little research verifying the exact nature of responses or why they occur. Considering the high impact people with a visible difference attribute to the general public (e.g., Bull and David, 1986; Porter et al., 1990; Thompson et al., 2002) and the improvement in anxiety and mental health seen when individuals with a visible difference have training in social skills (Clarke and Bradbury, 1996; Robinson et al., 1996; Rumsey, 1984),

research in this area could offer additional insights into the development of interventions, and understanding to people with a visible difference.

In a previous study Grandfield et al. (2005) looked at implicit attitudes to skin conditions and found an overall preference for clear skin. There were also differences between participants who knew someone with a skin condition and those that did not. This effect was exacerbated in males; they responded faster overall and showed greater preference for clear skin when they knew someone with a skin condition. However, the study had limitations; data collected regarding knowledge was not quantified, so descriptions of who they knew with a skin condition, or how they had known them were not collected. There was only one explicit measure (a thermometer scale) which did not give a comprehensive view of the explicit attitude. The study did not address individual differences, such as disgust sensitivity and shame. Also the use of the IAT meant that only an indication of preference for one group over another could be gained, but valence or degree of the preference were not accurate.

There are numerous theories explaining the reactions of the public, but these are based on the reports of individuals with a visible difference and observational studies. In contrast, this study aims to determine attitudinal and emotional responses to visible difference.

6.1.1 Aims

This study aimed to explore the IAT, explicit attitudes and psychophysiology in relation to skin conditions, and establish the effect of the individual differences and contact with people with skin conditions. Greater consideration was given to explicit measures; an additional scale was included to measure this component of attitudes.

Measures of individual differences were chosen because of their theoretical relevance and included; shame, disgust and appearance schema. Questionnaires were adopted to measure shame and appearance schema as well as disgust (rationale for all of the individual measures is given in Chapter 5; 5.2). In addition, psychophysiological data were collected specifically measuring associated facial muscles. It was anticipated that the IAT data would replicate previous results (Grandfield et al., 2005), and allow the impact of individual differences and knowledge/experience to be explored. Psychophysiology was used as a tool to look at attention, emotion and arousal in relation to people with skin conditions.

6.1.2 HYPOTHESES

The individual difference measures used within this thesis were based on the literature discussed in Chapters 2 and 3. Within Chapter 2 different theories were discussed that have attempted to account for reactions towards visible difference. These included disgust, shame and appearance concern; measures within this chapter were selected on the basis of their relationship with these constructs. Chapter 3 looked at attitudes and in addition to measuring implicit and explicit attitudes a scale is included to look at personal motivation.

6.1.2.1 EXPLICIT ATTITUDES

Previous research (i.e., Grandfield et al., 2005), found that on the thermometer scale most participants would state 'no preference', and a smaller proportion would display a preference for 'clear skin'. Within this study a semantic differential was also included in order to obtain a greater range of responses. Disgust, shame and appearance are also expected to have an impact on explicit attitudes.

- ✧ High disgust, shame and appearance schema ratings will be associated with greater negativity towards visible differences on the semantic differential and thermometer scales.
- ✧ Experience, (knowledge or having had a skin condition) will be associated with decreased negativity on the explicit measures.

6.1.2.2 IMPLICIT ASSOCIATION TEST

The primary expectation of the IAT was that participants would show an implicit preference for clear skin. An additional expectation was that experience would have an impact on the results such that participants who know someone with a skin condition would have longer reaction times on the IAT than participants who do not know someone. These hypotheses were predicted as they replicate findings in an earlier study (Grandfield et al., 2005). The internal and external motivation scale was also included as it was hypothesised that internal motivation may correlate with the IAT and external motivation with external measures, in line with research using the same measures in the context of race (Devine, 1989). Disgust, shame and appearance were also expected to have an impact such that participants with high scores on these measures would be more likely to show preference for clear skin on the IAT.

- ✧ Participants will show a preference for clear skin on the IAT.

- ✧ Males will respond faster than females and have greater preference for clear skin when they know someone.
- ✧ Knowledge will be associated with longer IAT reaction times, particularly in the incongruent condition.
- ✧ High disgust, shame and appearance schema ratings will be related to greater preference for clear skin.

6.1.2.3 PSYCHOPHYSIOLOGY

In terms of the psychophysiology, it was predicted that greater attention and arousal would be associated with skin conditions. Also, based on the disgust literature, it was anticipated that images of skin conditions would be associated with increased activation of the levator labii (Park et al., 2003; Vrana, 1993).

As the IAT found differences between participants who knew someone with a skin condition and those that did not, it was anticipated that there would be a difference in psychophysiology. In terms of heart rate, as the stimulus would not be as novel to those that know someone, it was thought they would display less deceleration. In terms of the EMG measures it was thought that disgust responses would be greater in participants who did not know someone.

In terms of the disgust, shame and appearance schema measures it was thought that higher ratings on these scales would be indicative of greater aversion to skin conditions on the psychophysiology.

- ✧ Participants will display greater attention and arousal towards images of skin conditions than towards clear skin on the heart rate measures.
- ✧ The EMG will have greater activation of the corrugator supercilii when viewing skin conditions, and possibly less activation of the zygomaticus major than when viewing clear skin.
- ✧ The levator labii muscle will be activated when viewing skin conditions indicating a disgust response.
- ✧ High disgust and appearance ratings are hypothesised to produce greater arousal, and negative valence when viewing skin conditions.
- ✧ Experience of or knowledge of skin conditions will affect arousal and attention, such that they will be reduced.

6.2 METHODOLOGY

6.2.1 DESIGN

The design of this study was a within group undifferentiated cross-sectional convenience sample. This design was elected as there are no specific a priori predictions (though several areas of interest; disgust, appearance, shame) and this would allow different areas of interest to be explored. Eighty-three participants were recruited (see 6.3.1 for details). The independent variables are shame, disgust, and appearance schema and experience. The dependant variables are the IAT, explicit measures of attitude and psychophysiology.

6.2.2 MEASURES

6.2.2.1 IMPLICIT ASSOCIATION TEST, PSYCHOPHYSIOLOGY AND SELF ASSESSMENT MANNEQUIN

These are all as described in Chapter 5 (5.4, 5.5, 5.6)

6.2.2.2 QUESTIONNAIRE AND EXPLICIT MEASURES

The questionnaire measures used were the appearance schema inventory (ASI-R), internal shame scale (ISS), other as shamer (OAS), Haidt disgust scale, Davey disgust scale, internal and external motivation scale (IMS/EMS), thermometer and semantic differential. Please see Chapter 5 (5.2) for full details and a rationale for the use of these scales. See Appendices 5-15 to view the scales.

6.2.3 PROCEDURE

Participants were recruited via a poster on the psychology notice board (Appendix 29) in the University of Sheffield. Participants were offered either course credit or £5 for their participation (six participants chose £5). They signed up to a time slot that suited their availability. The IAT and psychophysiology tasks were counterbalanced, so were the picture sets within them and the order of blocks in the IAT. Microsoft Excel was used to create a spreadsheet to ensure accurate counterbalancing, in total there were 80 different conditions generated with participant numbers (Appendix 30). Participants were assigned to the next counterbalance condition in the list in the order they came to participate, determined by the participants. The two disgust scales were also counterbalanced; the questionnaire sets were collated such that half of them had the Davey disgust scale before the Haidt, the other half had the Haidt scale before the Davey. All of the questionnaires were in random

order and participants were given the questionnaire pack at the top of the pile.

Due to the counterbalancing the tasks were presented in different orders with different contents for many of the participants. Therefore, this procedure was written as it would be for the first participant in the counterbalance list (Appendix 30). The participant was given a clipboard with an overview sheet, with a brief introduction to the experiment. They were asked to sign a consent form (see Appendix 3). Next, the participant filled in the ASI-R. Filling in the ASI-R at this point informed all of the participants that the study was concerned with appearance. The counterbalancing made it difficult to ascertain when the participants may gain this knowledge, it was likely that in different conditions it would be realised at different points. When the questionnaires were completed, the participant took part in the psychophysiology task (as detailed in Chapter 5; 5.5). Next they completed the SAM task (Chapter 5; 5.6). The participant was asked to fill out the disgust, ISS and OAS scales. The final task was the IAT (Chapter 5; 5.4) followed by the explicit measures and demographic variables. Finally the participant was debriefed and any queries they had were answered. Figure 6-I shows this procedure on a time line.

Figure 6-I: Approximate Time Line (minutes)

Time Line

0	Read instructions 3	Fill out initial questionnaires 7	Attach electrodes 12	Psychophysiology task 28	Wash Hands 31	SAM tasks 37	Questionnaires 41	IAT 61	Final explicit measures 71	Debrief 76

N.B. IAT and psychophysiology are reversed, according to counterbalancing.

6.3 RESULTS

6.3.1 PARTICIPANTS

Complete data for 75 of the 83 participants (62 female and 21 male) were available. Problems occurred with the psychophysiological equipment, in terms of data collection, noise in the data and equipment failure for five participants. A fire alarm disrupted one experiment, one participant had a (self-reported) phobia of all things medical and one participant was claustrophobic. Of the remaining participants; overall they ranged in age between 18 and 28 ($\bar{x}$ =22.3 years, σ =2.31).

6.3.2 Demographic Variables

Of the participants, 57% (*n*=47) had never had a skin condition. Of the remaining 36 participants who had had a skin condition, 53% (*n*=19) currently had a skin condition, 4% (*n*=1) had had a skin condition in the last year, 19% (*n*=7) between one and five years ago and 24% (*n*=9) more than five years ago. Eighty-three percent (*n*=30) received treatment for their skin condition. Areas affected were the face (38%; *n*=14), arms and legs (10%; *n*=4), torso (4%; *n*=1), and scalp (4%; *n*=1). When asked whether anyone close to them had had a skin condition, 55% (*n*=46) of the sample knew someone. The majority mentioned a sibling (21%; *n*=10) or friend (18%; *n*=8), also mentioned were parents, partners and other family. Very few participants (17%; *n*=19) said they knew someone else with a skin condition, of these 12 (75%) said that the condition affected their face. Overall the most common conditions were eczema and acne; also reported were impetigo, psoriasis, allergies, warts and birthmarks.

Given the small numbers in each of these groups, further analyses using the demographics were categorised into groups; different skin conditions were categorised as 'have had a skin condition' and 'have not had a skin condition'; different people known (e.g., partner, parent) were collapsed into 'know someone with a skin condition' and 'don't know someone with a skin condition. Using more specific groups reduces the amount of participants within each group to amounts too low to complete reliable analysis on.

6.3.3 Data Quantification

Data was quantified as described in Chapter 5 (5.3) with one exception. The semantic differential and thermometer scales were coded such that a high score indicates a preference for skin conditions and a low score indicates a preference for clear skin.

6.3.4 Questionnaire Measures

6.3.4.1 Summary of Scales; Reliability, Normality and Outliers

The reliability of the scales was examined using Cronbach alphas (Table 6-I) to ensure they were measuring the construct intended. The reliability for most of the scales was high, generally >.79. Normality was checked to explore skewness and kurtosis (these were divided by the value for standard error and checked to ensure the resulting value was between ±3). As there were fewer than 2000 participants, Shapiro Wilk values were examined to ensure that the

scales were within normality assumptions. The thermometer scale and the semantic differential failed to meet normality distributions on these measures. The data within the thermometer scale was clearly in three groups; prefer clear skin, prefer skin conditions and no preference, therefore this scales was categorised in this way for further analysis. The semantic differential was categorised in the same manner.

Table 6-I: Cronbach Alphas of Questionnaire Measures

Scale	Dimension	Alpha	$\bar{x}$ (σ)
OAS	External Shame	.92	21.1 (10.14)
ISS	Positive Self-Esteem	.82	7.91 (2.16)
ISS	Internal Shame	.94	15.55 (9.42)
ASI-r (Appearance)	Self-Evaluative	.89	37.8 (9.68)
ASI-r (Appearance)	Motivational	.88	28.12 (6.44)
Davey Disgust	Disgust Trait	.87	37.9 (7.66)
Davey Disgust	Disgust Sensitivity	.88	41.46 (10.4)
Haidt Disgust	Disgust	.87	78.49 (12.77)
EMS/IMS	External Motivation	.8	27.85 (7.79)
EMS/IMS	Internal Motivation	.85	37.26 (7.38)

Three disgust scales were used within this study, each had high Cronbach alphas. The scales had significant Pearson's correlations between them (>.69, p<.01). In order to reduce the total amount of scales within the study Cronbach alphas for all three scales together were also examined. The value increased to .94; the overall alpha was not significantly affected by individual items in the scale. Therefore, the remaining analyses referring to disgust are an amalgamation of all three scales. One participant was an outlier in four of the scales; they were removed from further analysis.

6.3.4.2 Correlations Between Scales

Figure 6-II shows the correlations between self-esteem, appearance, disgust and shame. As there were five variables, Bonferroni corrections were used to reduce the chance of type one errors. Therefore, only values that are significant at the .01 level are discussed. Disgust correlated with all measures except positive self-esteem, which itself negatively correlated with external and internal shame. Therefore, higher self-esteem is associated with lower shame. High disgust is associated with high shame and appearance concerns. Lastly, appearance self-evaluation correlated with internal shame.

Figure 6-II: Correlation Matrix; Individual Differences

	Disgust	Self-Esteem	Internal Shame	Motivation	Self-Evaluation
Self-Esteem	-0.04				
Internal Shame	**.37****	**-.59****			
Appearance Motivation	**.34****	.22*	0.09		
Appearance Self-Evaluation	**.44****	-0.01	**.40****	**.625****	
External Shame	**.32****	**-.60****	**.82****	0.02	.24*

*p <.05 ** p <.01

6.3.5 Explicit Measures and Individual Differences

The means for the thermometer ($\bar{x}$ =-.55, σ =1.39) and semantic differential ($\bar{x}$ =-1.67, σ =2.76) indicated a preference for clear skin. Overall, the ratings given on the thermometer scale were, no preference (56%; n=47), a preference for clear skin (39%; n=32) or a preference for skin conditions (5%; n=4). The semantic differential demonstrated a similar pattern, 62% (n=51) preferred clear skin, 25% (n=21) displayed no preference and 13% (n=11) preferred skin conditions. The difference between the two scales was a reduction in the number stating no preference, and a resulting increase in the preference dimensions.

6.3.5.1 Effects of Knowledge, Personal Experience and Gender

Initially one-way ANOVAs were used to ascertain whether there was a difference in scores on the thermometer and semantic differential scales according to whether people knew somebody with a skin condition or whether they had personally experienced a skin condition. Participants who did not know someone had significantly lower scores on the thermometer scale ([F(1,80)=6.83, p<.05], don't know: $\bar{x}$ =-.89, σ =1.23; know $\bar{x}$ =-.11, σ =1.47) and lower, approaching significance on the semantic differential ([F(1,79)=3.31, p=.07], don't know: $\bar{x}$ =-2.15, σ =3.18; know $\bar{x}$ =-1.04, σ =1.94). This indicates that they displayed greater negativity explicitly if they did not know someone with a skin condition. Personally experiencing a skin condition did not have a statistically significant impact on either the thermometer scale [F(1,80)=2.23, p=.14] or the semantic differential [F(1,79)=.1, p=.75]. Gender effects were also explored. There were no statistically significant differences between males and females for the thermometer scale [F(1,80)=2.24, p=.14]. Overall males showed an explicit preference for clear skin on the semantic differential ([F(1,79)=4.21, p<.05], male $\bar{x}$ =-2.75, σ =3.52; female $\bar{x}$ =-1.32 σ =2.39).

6.3.5.2 Correlations between Explicit Measures and Individual Differences

Figure 6-III shows Pearson's correlations between the explicit measures and the individual differences. The thermometer scale has a statistically significant correlation with internal shame ($r(80)=.29$, $p<.01$) and with internal motivation ($r(80)=.31$, $p<.01$), such that high preference for clear skin correlates with high internal motivation and shame. The semantic differential and thermometer scales have a small positive correlation between them ($r(80)=.24$, $p<.05$).

Figure 6-III: Correlation Matrix; Explicit Measures & Individual Differences

	External Shame	Internal Shame	Positive Self-Esteem	Appearance Self-Evaluation	Appearance Motivation	Internal Motivation	External Motivation	Disgust	Thermometer
Thermometer	.13	.29**	-.07	.1	-.09	.31**	.01	.12	
Semantic Differential	-.04	-.15	.17	-.02	-.14	.04	-.14	-.14	.24*

*$p<.05$ ** $p<.01$

6.3.5.3 Gender and Individual Differences

Although there were few male participants, gender effects were explored with independent t-tests. There were effects of gender on appearance self-evaluation ($t(81)=2.18$, $p<.05$) appearance motivation ($t(81)=2.93$, $p<.01$), internal motivation ($t(79)=2.05$, $p<.05$), and disgust ($t(80)=2.99$, $p<.01$) (Table 6-II summarises these results). Males reported lower appearance concerns, internal motivation and disgust. There were no effects of gender on the explicit measures (thermometer ($t(80)=1.4$, $p=.17$), semantic differential ($t(78)=1.37$, $p=.17$). Knowledge and/or personal experience had no significant differences within the individual difference measures (knowledge: external shame ($t(80)=.58$, $p=.56$), appearance evaluation ($t(81)=-.56$, $p=.58$), appearance motivation ($t(81)=-.13$, $p=.9$), positive self-esteem ($t(80)=.2$, $p=.84$), internal shame ($t(80)=-.57$, $p=.57$), and disgust ($t(80)=1.16$, $p=.25$), personal experience; external shame ($t(80)=-.22$, $p=.82$), appearance evaluation ($t(81)=-.32$, $p=.74$), appearance motivation ($t(81)=.11$, $p=.92$), positive self-esteem ($t(80)=1.32$, $p=.19$), internal shame ($t(80)=-1.01$, $p=.28$), and disgust ($t(80)=1.79$, $p=.08$)).

Table 6-II: Means and Standard Deviation by Gender for the Questionnaire Measures

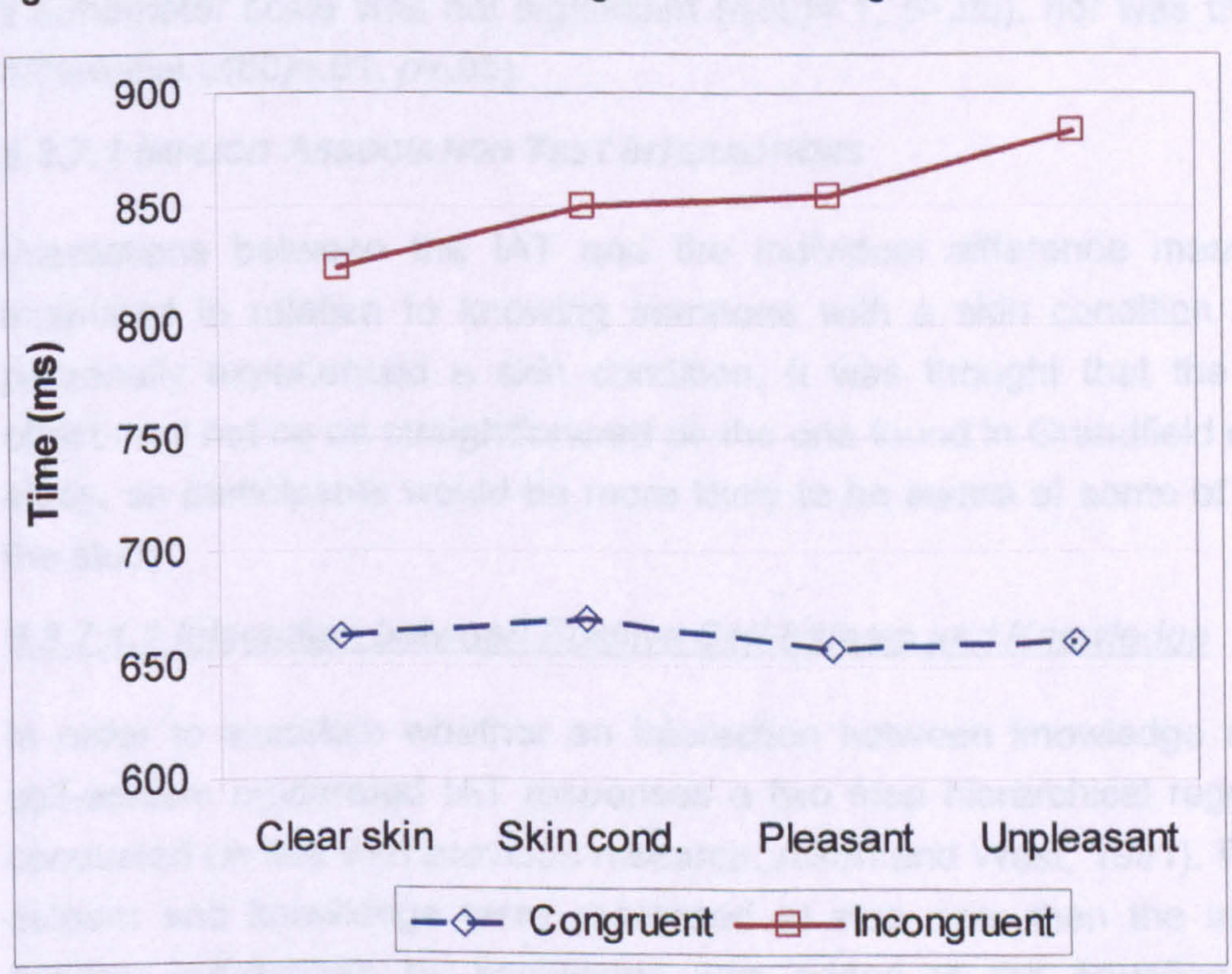
Scale Dimension	Female $\bar{x}$ (σ)	*p*	Male $\bar{x}$ (σ)
External Shame	22.27 (10.31)	ns	17.45 (8.86)
Positive Self-Esteem	7.81 (2.25)	ns	8.25 (1.86)
Internal Shame	16.66 (10.04)	ns	12.1 (6.21)
Appearance Self-Evaluation	39.11 (9.18)	*	33.9 (10.27)
Appearance Motivation	29.27 (5.57)	*	24.71 (7.68)
Disgust	162.65 (25.5)	**	143 (25.7)
External Motivation	28.26 (7.72)	ns	26.6 (8.08)
Internal Motivation	32.21 (6.06)	*	28.55 (6.15)

*$p<.05$ ** $p<.01$

6.3.6 Implicit Association Test

In line with previous research (Greenwald et al, 1998) a one-tailed t-test was conducted to see whether there was a significant preference for clear skin. The results were significant ($t(83)=11.2$, $p<.001$). From Figure 6-IV, it is evident that the congruent condition was associated with faster reaction times across all four components of the construct (pleasant, unpleasant, clear skin, skin condition). This indicates that participants responded more positively to people with clear skin than those with skin conditions.

Figure 6-IV: Mean IAT Scores for Congruent and Incongruent Conditions



6.3.6.1 Further Tests

A two way between group ANOVA was conducted to determine any effects of

personally experiencing a skin condition or knowing someone with a skin condition on the IAT. There was not a main effect of knowledge [$F(1,79)=.01$, $p=.92$], or of having personally experienced a skin condition [$F(1,79)=.22$, $p=.64$], however the interaction was approaching significance [$F(1,79)=3.06$ $p=.08$]. Means were lowest for knowing someone and personally experiencing a skin condition ($\bar{x}=.55$, $\sigma=.39$) indicating less preference for clear skin, the mean was largest for knowing someone and not personally experiencing a skin condition ($\bar{x}=.77$, $\sigma=.39$) indicating greater preference for clear skin.

An independent t-test was conducted to assess gender effects on the IAT, this was approaching significance ($t(81)=1.94$, $p=.06$). Males were faster than females to respond in the present task ($\bar{x}=714$ms, $\sigma=223$; $\bar{x}=754$ms, $\sigma=170$; respectively). There was no apparent order effect for the IAT or psychophysiology ($t(81)=-.98$, $p=.33$) or for the picture set used within the IAT ($t(81)=-1.34$, $p=.19$).

6.3.7 Correlations between the Implicit Association Test and Explicit Measures

In line with previous IAT research, correlations between the implicit and explicit measures were performed. The relationship between the IAT and the thermometer scale was not significant ($r(80)=.1$, $p>.05$), nor was the semantic differential ($r(80)=.01$, $p>.05$).

6.3.7.1 Implicit Association Test Interactions

Interactions between the IAT and the individual difference measures were examined in relation to knowing someone with a skin condition and having personally experienced a skin condition. It was thought that the knowledge effect may not be as straightforward as the one found in Grandfield et al. (2005) study, as participants would be more likely to be aware of some of the aims of the study.

6.3.7.1.1 Interaction between Positive Self-Esteem and Knowledge

In order to ascertain whether an interaction between knowledge and positive self-esteem moderated IAT responses a two step hierarchical regression was conducted (in line with previous research; Aiken and West, 1991). Positive self-esteem and knowledge were regressed at step one, then the interaction of positive self-esteem by knowledge was added to the equation at step 2. Variables were mean-centred to reduce potential multicollinearity.

Table 6-III shows that positive self-esteem and knowing someone with a skin

condition on its own, accounted for just 1% of the variance in the IAT; the addition of the interaction term contributed a significant increment in the variance accounted for; 10% ($\Delta R2 = .1$, $p<0.001$).

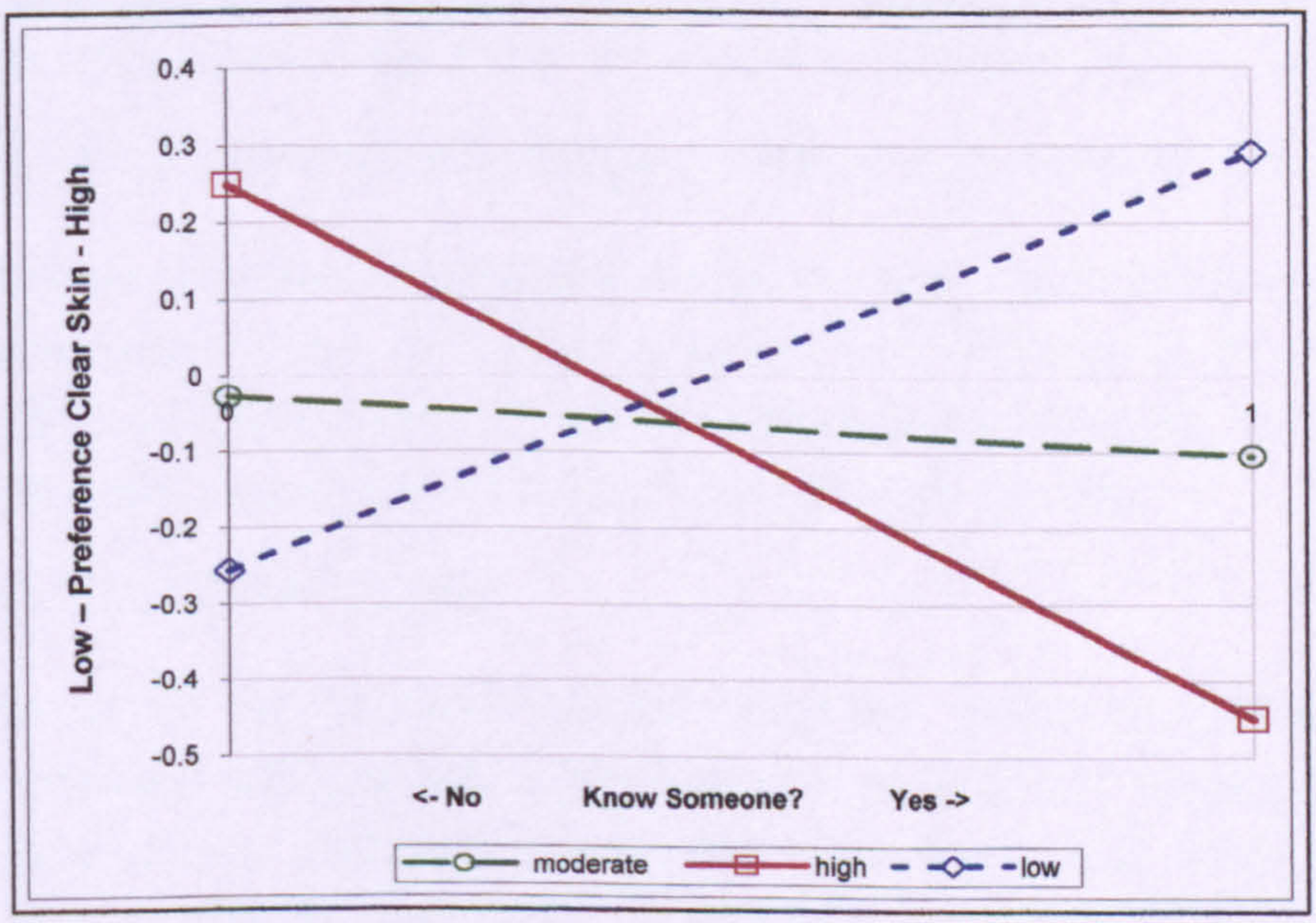
Table 6-III: Hierarchical Regression of IAT, Knowing Someone with a Skin Condition, Positive Self-Esteem and the Interaction Term.

Step	Variable Entered	β	β
1	Positive Self-Esteem	-.08	.26
1	Know	-.05	-.04
2	Know x Positive Self-Esteem	---	-.47**
$\Delta R2$		.01	.1**
ΔF		2.7	8.1**
$R2$		.01	.11
Model F		2.7	2.9*

*$p<.05$ ** $p<.01$

The interaction was decomposed in the manner suggested by Aiken and West (1991). Simple slopes were computed for knowledge at three levels of the moderator, low score on positive self-esteem (one standard deviation below the mean), moderate score on positive self-esteem (the mean) and high score on positive self-esteem (one standard deviation above the mean).

Figure 6-V: Interaction between Knowledge, Positive Self-Esteem and the IAT: Simple Slopes for Knowledge at Three Levels of Self-Esteem.



The interaction demonstrates (Figure 6 V) that knowing someone with a skin condition is associated with reduced preference for clear skin when participants score highly on positive self esteem (β=-.7, $\rho<.05$). At low and moderate levels

of positive self-esteem, there is no significant association between knowing someone and preference for clear skin (low; β=.55, ρ>.05, moderate; β=-.08, ρ>.05).

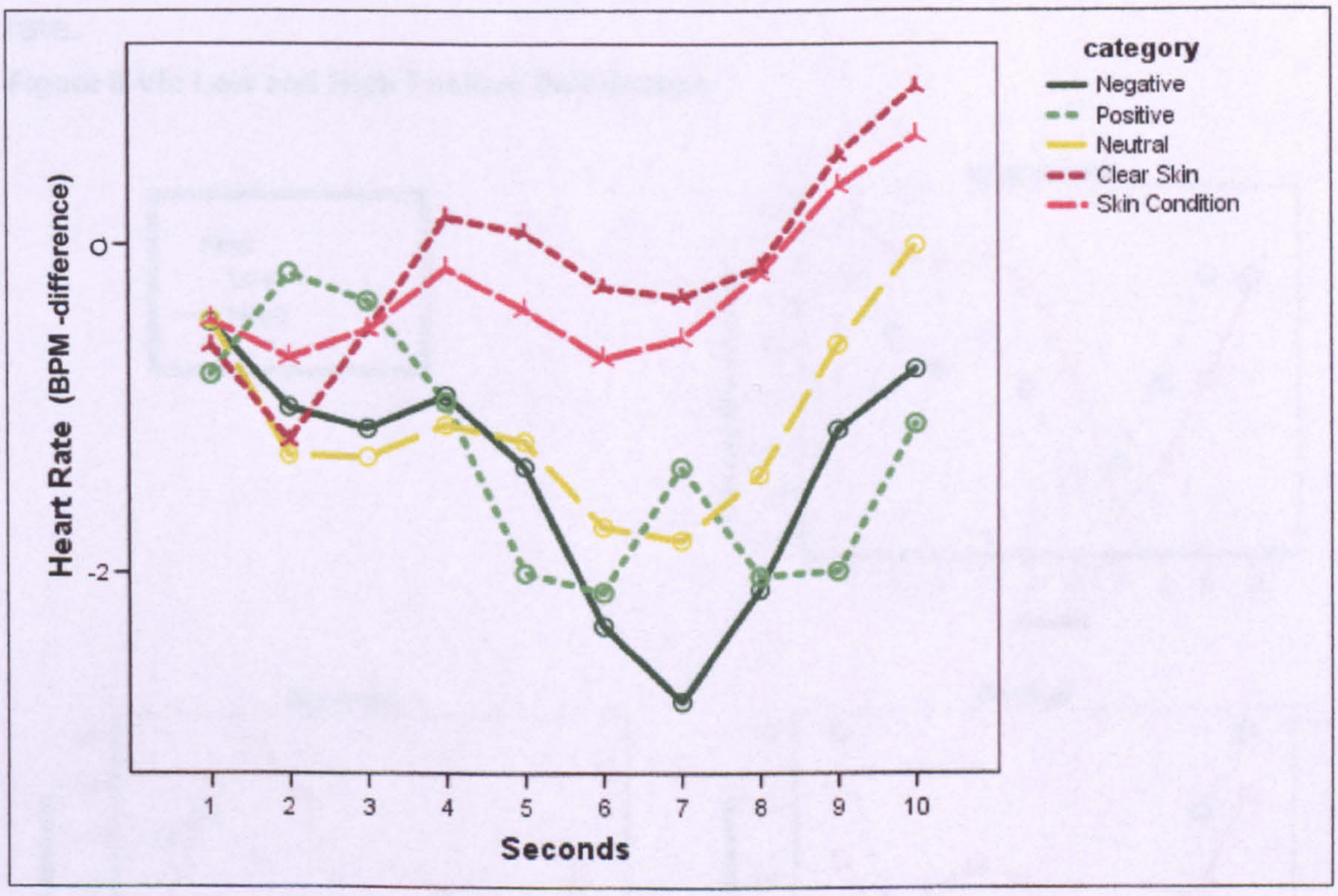
6.3.8 PSYCHOPHYSIOLOGY

6.3.8.1 HEART RATE

The data were analysed using a repeated measure ANOVA with two within factors (seconds x category) and one between factor (order). Ten seconds of post stimulus data was examined. There was no effect of order so further analysis were completed without this factor (*WL*=.43, $F(36,36)=1.35$, p=.19).

Initially, heart rate was examined to ascertain that the data collected was reliable and to determine any differences between the stimuli groups. A main effect of seconds was found [$F(9,64)=13.72$, $p<.001$] showing the expected deceleration, and category [$F(4,69)=9.2$, $p<.001$]. Generally the slides showing clear skin and skin conditions had less impact on heart rate, there was very little deceleration and overall the heart rate was at a higher level than when viewing the IAPS slides. Figure 6-VI shows heart rate by category over time, when viewing the IAPS stimuli, participants had greater heart rate deceleration than when viewing the stimuli of clear skin and skin conditions. There was a significant interaction between time and category [$F(36,37)=4.61$, $p<.001$], the largest difference appears at second seven.

Figure 6-VI: A Graph of Heart Rate Change by Seconds and Category



6.3.8.1.1 Effects of the Individual Difference Variables

The effects of individual difference variables were analysed using repeated measure ANOVAs with two within factors (seconds x stimulus set) and one between factor (independent variable). Using a median spilt the independent variables were divided into dichotomous variables (high or low).

6.3.8.1.1.1 Gender, Knowledge and Personally Experiencing a Skin Condition

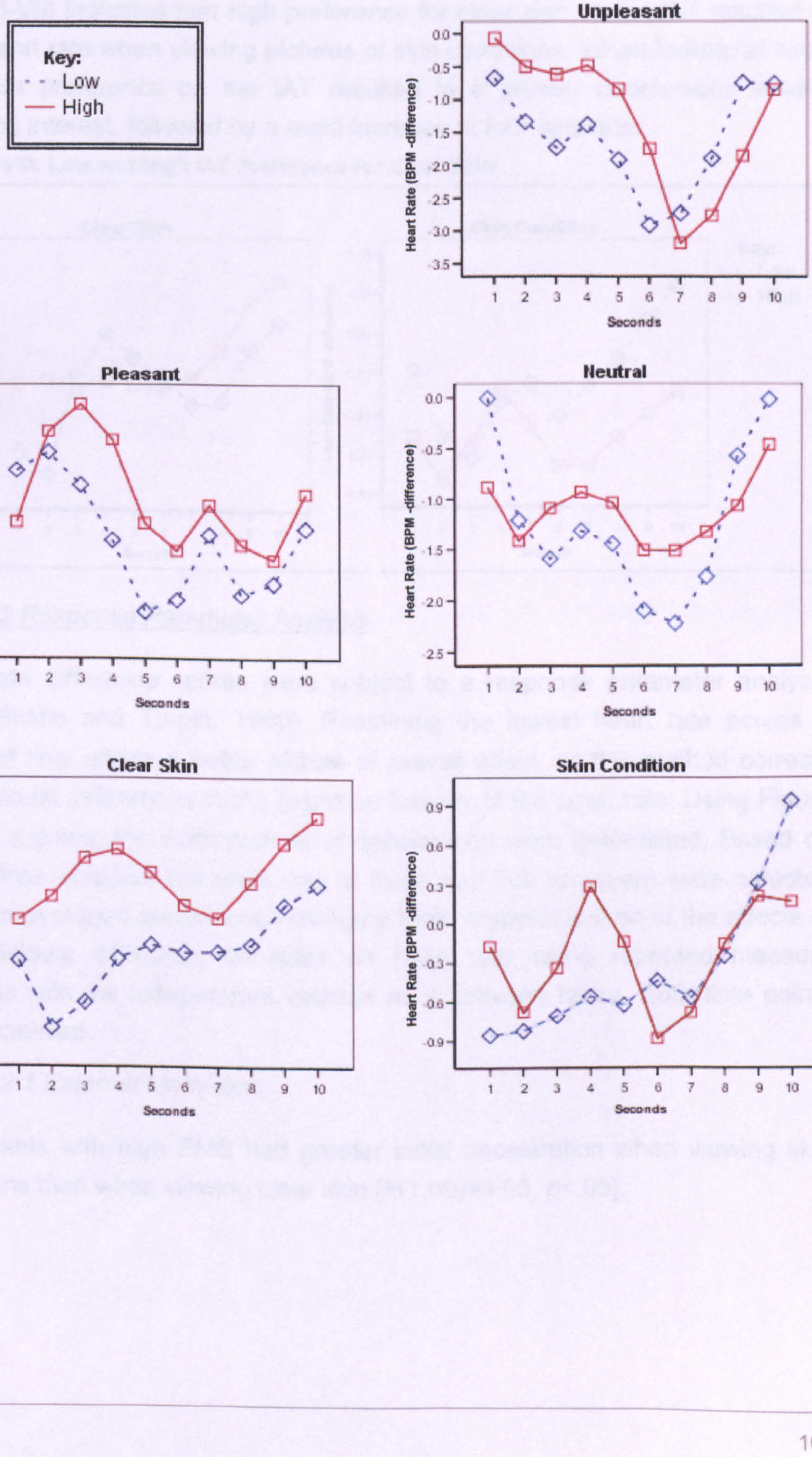
Effects of gender, knowledge and personally experiencing a skin condition were examined. None of these variables had an impact on heart rate (gender (WL=.44, F(36,36)=1.27, p=.24), knowledge (WL=.32, F(72,70)=.73, p=.91), personal experience (WL=.45, F(36,35)=1.15, p=.34).

6.3.8.1.1.2 Self-Esteem

Using all five stimulus groups (negative, positive, neutral, clear skin, skin condition) with positive self-esteem as the between subject factor, category by seconds by positive self-esteem was significant (WL=.2, F(36,27)=2.94, p<0.01). Figure 6-VII shows that overall heart rate was lower for participants with low self-esteem, they displayed a greater initial deceleration indicating more interest in the stimuli. When viewing the images of skin conditions, participants with high self-esteem showed the typical triphasic response (Lang

and Hnatiow, 1962) those with low self-esteem had a gradual increase in heart rate.

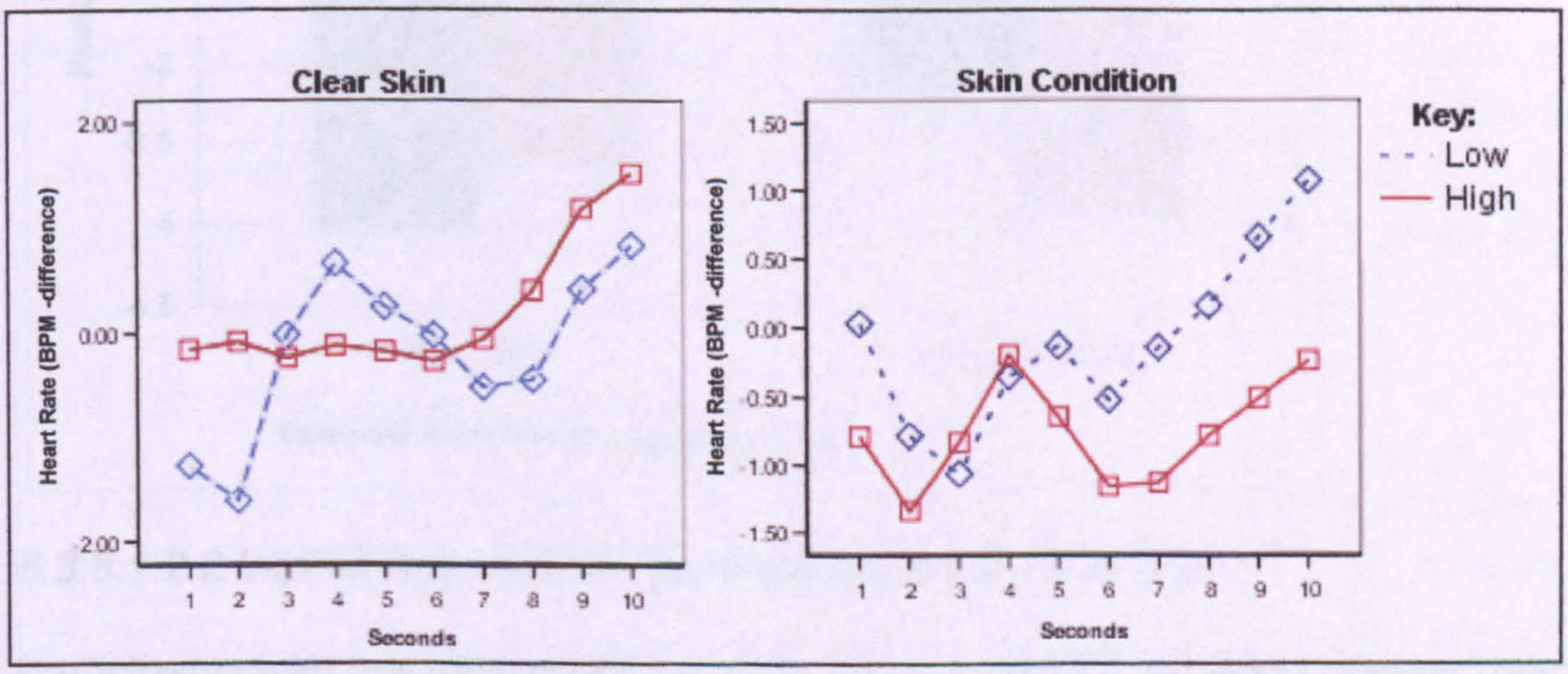
Figure 6-VII: Low and High Positive Self-Esteem



6.3.8.1.1.3 Implicit Association Test Preference

Using clear skin and skin condition stimulus groups with the IAT as the between subject factor, category by seconds by IAT was significant [$F(9,63)=2.5$, $p<.05$]. Figure 6-VIII indicates that high preference for clear skin on the IAT resulted in lower heart rate when viewing pictures of skin conditions. When looking at clear skin, less preference on the IAT resulted in a greater deceleration initially indicating interest, followed by a rapid increase at four seconds.

Figure 6-VIII: Low and High IAT Preference for Clear Skin



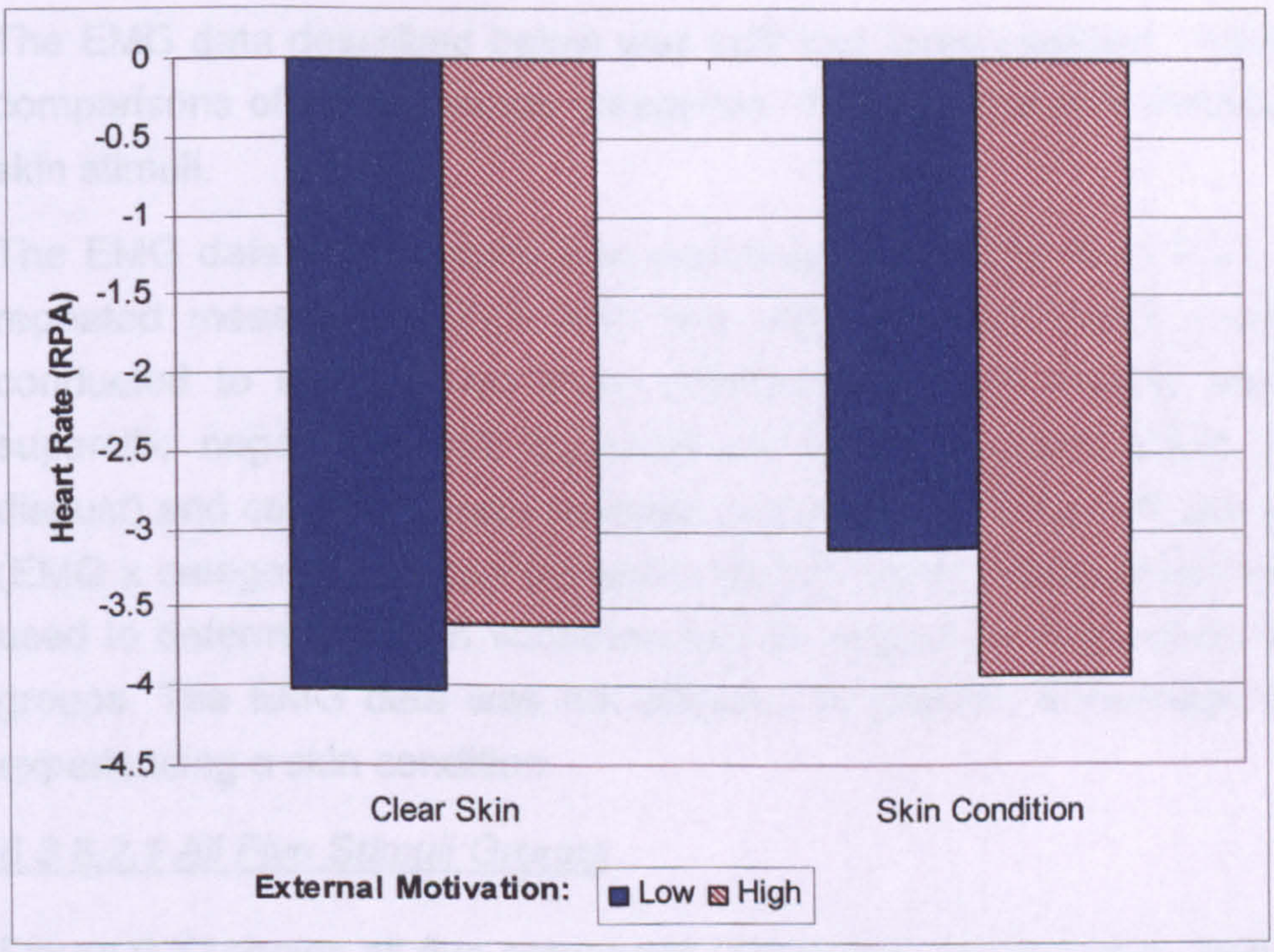
6.3.8.1.2 Response Parameter Analysis

Heart rate difference scores were subject to a response parameter analysis (RPA; Siddle and Turpin, 1980). Examining the lowest heart rate across a period of time allows a better picture of overall effect, as this method corrects for individual differences in the response latency of the heart rate. Using Figure 6-VI as a guide, the main periods of deceleration were determined. Based on these, time windows (seconds one to three and five to seven) were selected and then averaged across each category type. Analysis looked at the effects of the individual difference variables on heart rate using repeated measure ANOVAs with the independent variable as a between factor. Both time points were assessed.

6.3.8.1.2.1 External Motivation

Participants with high EMS had greater initial deceleration when viewing skin conditions than when viewing clear skin [$F(1,69)=4.05$, $p<.05$].

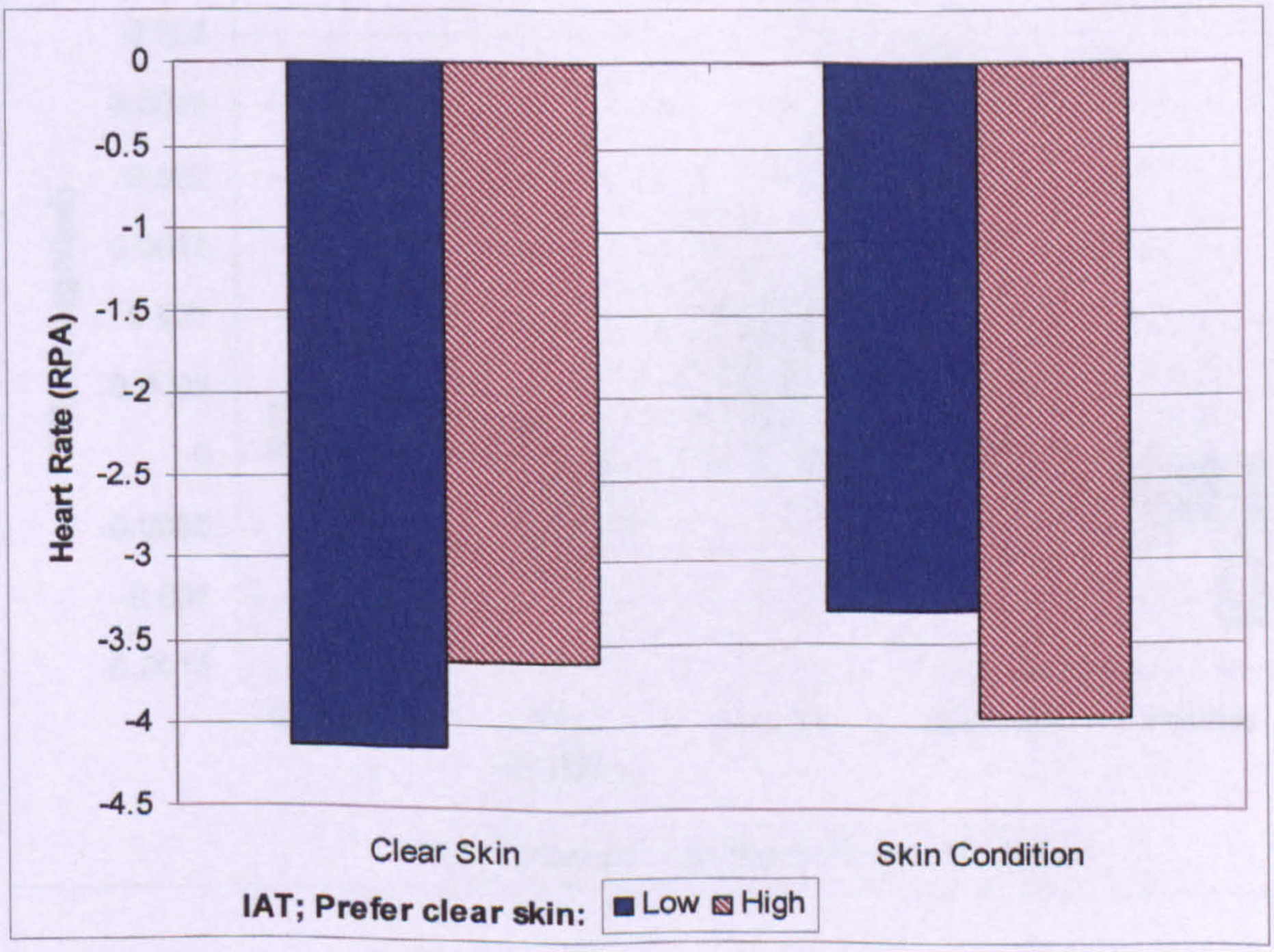
Figure 6-IX: External Motivation Scale (EMS), Time 1; Clear Skin and Skin Condition



6.3.8.1.2.2 Implicit Association Test Preference for Clear Skin

Participants with low preference for clear skin on the IAT exhibited greater heart rate deceleration when viewing clear skin and but not when viewing skin conditions at time 2 [$F(1,71)=6.72$, $p<.05$].

Figure 6-X: IAT, Time 2, Clear Skin and Skin Condition



6.3.8.2 ELECTROMYOGRAPH ACTIVITY

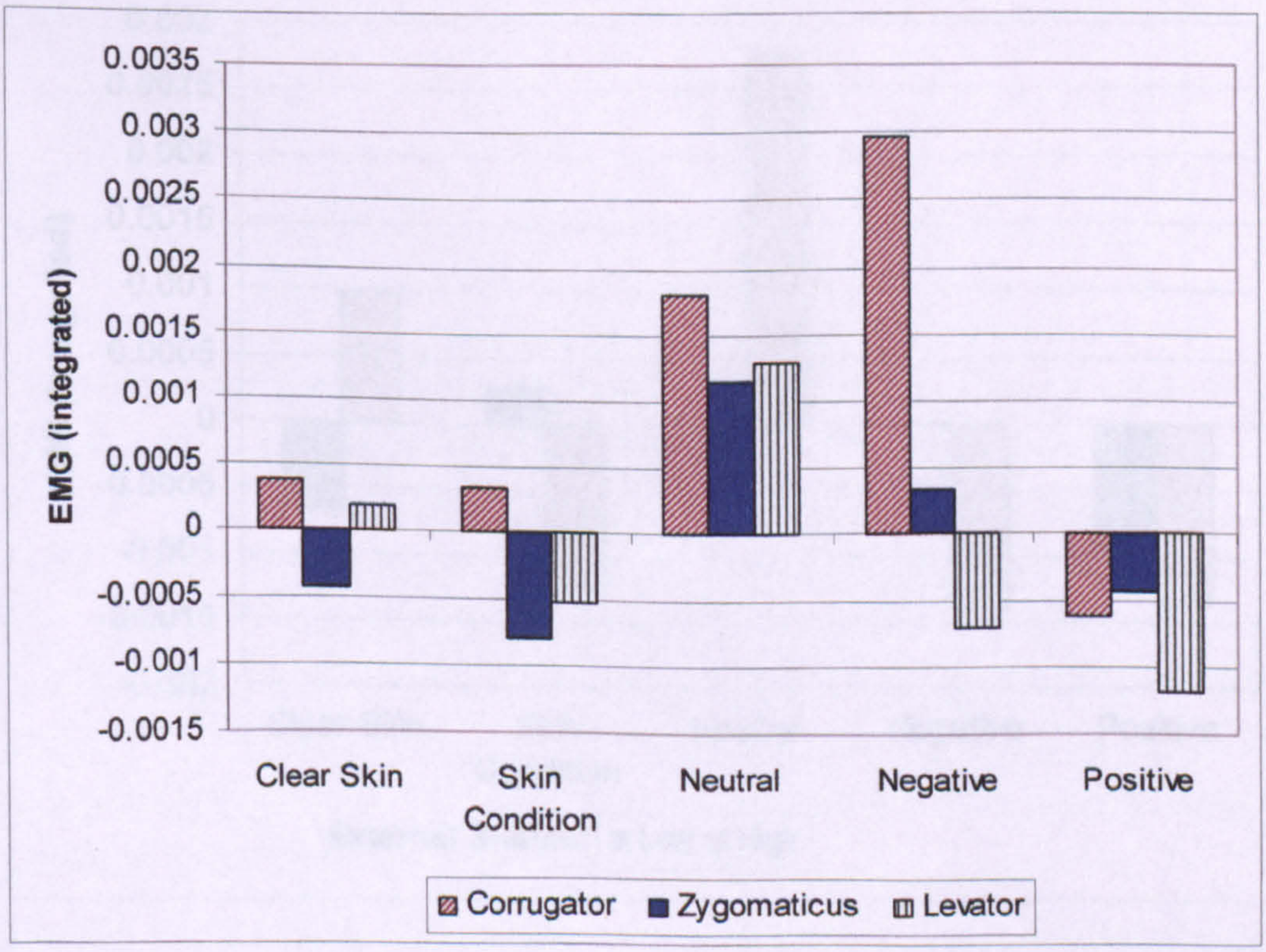
The EMG data described below was split into three sections, initially looking at comparisons of all five image categories, then just the skin condition and clear skin stimuli.

The EMG data were reduced as described in Chapter 5 (5.5.3.2.1). Initially a repeated measure ANOVA with two within factors (EMG x category) was conducted to see if there were differences across muscle site (corrugator supercilii; negative affect, zygomaticus major; positive affect, levator labii; disgust) and category. Then repeated measure ANOVAs with two within factors (EMG x category) and one between subject factor (independent variable) were used to determine which variables had an impact on responding to the stimuli groups. The EMG data was not affected by gender, knowledge or personally experiencing a skin condition.

6.3.8.2.1 All Five Stimuli Groups

Figure 6-XI shows all five categories (1=neutral, 2=clear skin, 3=skin condition, 4=negative, 5=positive). There was a significant effect of category (*WL*=.88, $F(4,72)=2.56$, $p<.05$) and category by EMG (*WL*=.8, $F(8,68)=2.13$, $p<.05$). There were no effects of order (*WL*=.94, $F(4,70=1.45$, $p=.24$).

Figure 6-XI: EMG across All Categories



The corrugator supercilii muscle had the most differential reactivity, mainly across the positive and negative categories. Both the images of skin conditions and clear skin have similar effects on EMG activation, though it would appear that levator labii has the biggest drop. The corrugator supercilii has a significant effect of category (*WL*=.77, *F*(4,72)=5.44, *p*<.001).The zygomaticus major (*WL*=.92, *F*(4,72)=1.53, *p*=.2) and the levator labii (*WL*=.9, *F*(4,72)=1.92, *p*=.12) do not.

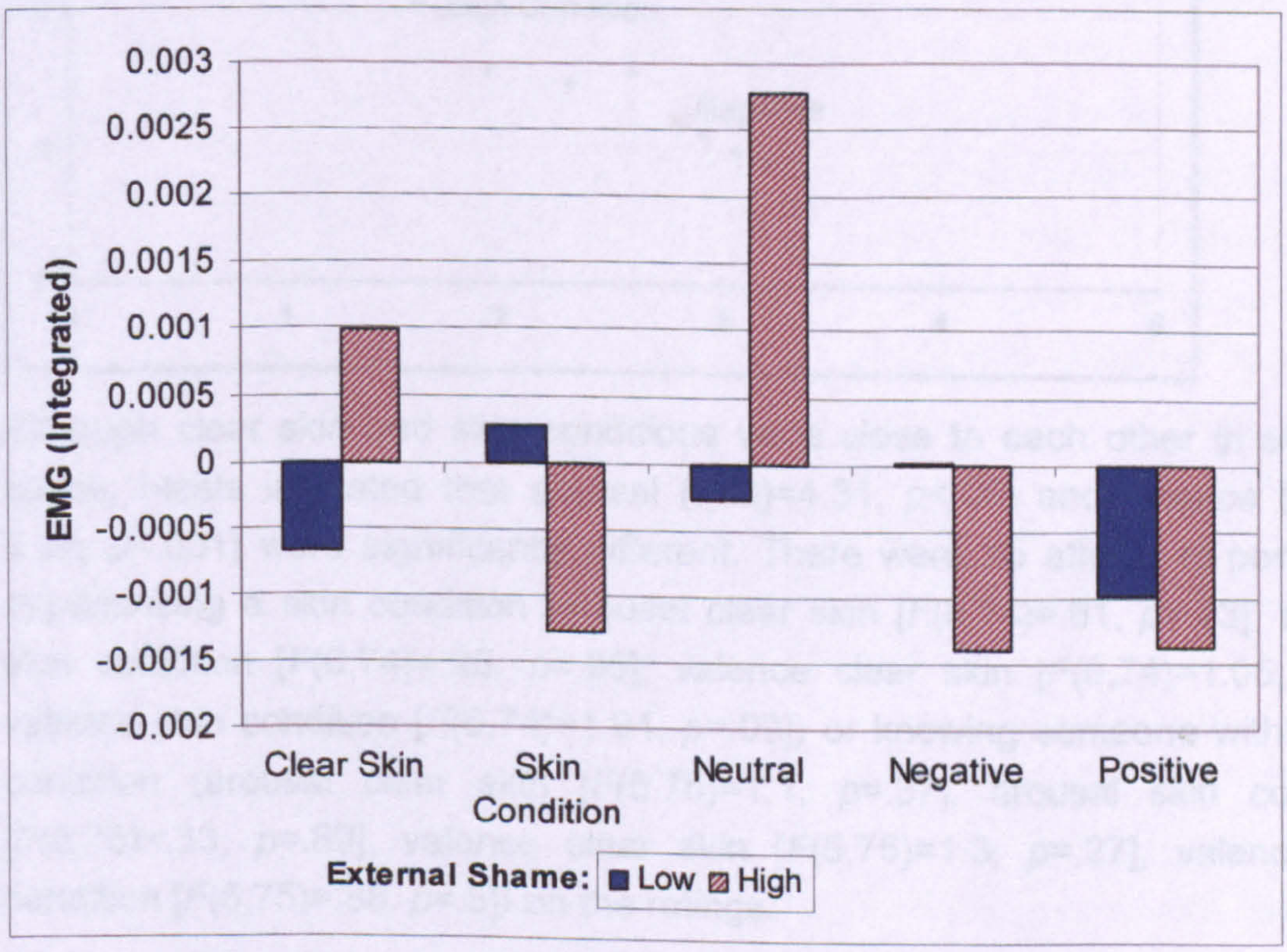
6.3.8.2.1.1 Gender, Knowledge, Personally Experiencing a Skin Condition

Effects of gender, knowledge and personally experiencing a skin condition were examined. None of these factors had a significant impact on EMG (gender (*WL*=.96, *F*(4,70=.7, *p*=.6), knowledge (*WL*=.96, *F*(4,70=.75, *p*=.56) personal experience (*WL*=.93, *F*(4,70=1.38, *p*=.25).

6.3.8.2.1.2 Other as Shamer Scale

Figure 6-XII shows that participants who scored highly on the OAS scale had high activation of the levator labii during negative stimuli, the difference in high and low external shame across these stimuli was significant (*WL*=.87, *F*(4,71)=2.65, *p*<.05).

Figure 6-XII: Effects of Low and High OAS for Levator across the Categories.



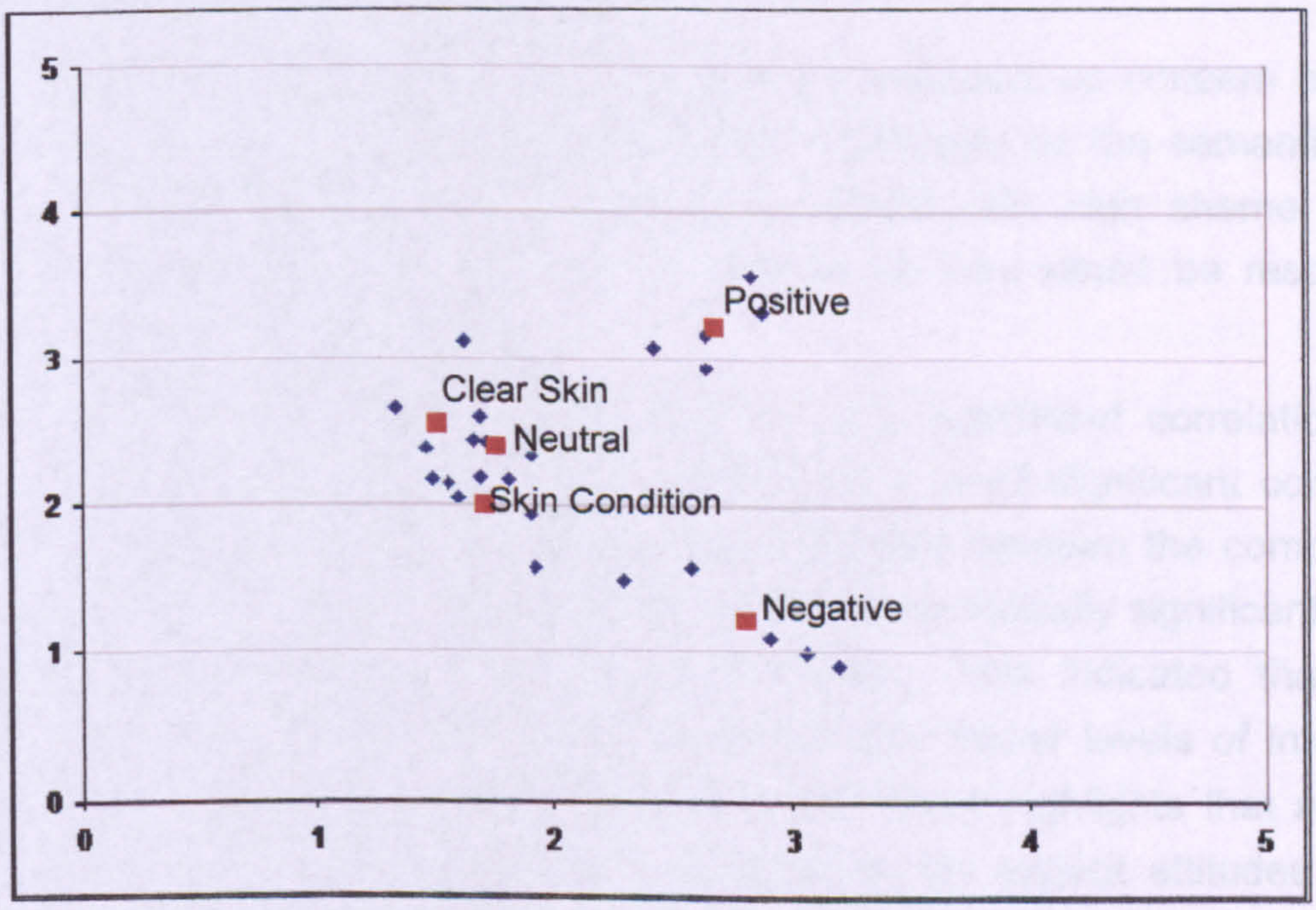
6.3.8.2.2 Clear Skin and Skin Condition Stimuli

For clear skin and skin conditions there were no significant effects of category (*WL*=.99, *F*(2,74)=.31, *p*=.58), or EMG by category group (*WL*=.99, *F*(2,74)=.14, *p*=.87), suggesting that there was little difference in responses between the two stimuli.

6.3.9 Self Assessment Mannequin and Ratings

Data were quantified as described in Chapter 5 (5.6.2.1). In Figure 6-XIII the blue squares show individual ratings for pictures and the red squares show the average ratings. The shape falls into the expected boomerang. Clear skin and skin condition stimuli shared the same region as neutral stimuli.

Figure 6-XIII: Arousal and Valence plotted in Affective Space



Although clear skin and skin conditions were close to each other in affective space, t-tests indicated that arousal (*t*(80)=4.31, *p*<.05) and valence (*t*(80)=-9.32, *p*<.001) were significantly different. There were no effects of personally experiencing a skin condition (arousal clear skin [*F*(6,74)=.61, *p*=.73], arousal skin condition [*F*(6,74)=.28, *p*=.95], valence clear skin [*F*(6,74)=1.05, *p*=.4], valence skin condition [*F*(6,74)=1.94, *p*=.09]) or knowing someone with a skin condition (arousal clear skin [*F*(5,75)=1.1, *p*=.37], arousal skin condition [*F*(5,75)=.33, *p*=.89], valence clear skin [*F*(5,75)=1.3, *p*=.27], valence skin condition [*F*(5,75)=.88, *p*=.5]) on the ratings.

Gender had an effect on attractiveness ratings (Figure 6-XIV) for skin conditions [*F*(1,80)=4.06, *p*<.05] but not for clear skin [*F*(1,80)=3.18, *p*=.08], such that

males rated everyone lower overall.

Figure 6-XIV: Ratings of Attractiveness by Gender

	Clear Skin	Skin Condition
Male	2.55	1.44
Female	2.78	1.69

6.4 Discussion

The aims of this study were to explore how appearance concern, self-esteem, disgust, shame and knowledge are associated with explicit and implicit measures of attitude and psychophysiological reactions towards skin conditions.

6.4.1 Explicit Measures

It was hypothesised that high disgust and appearance concern ratings would result in greater negativity towards skin conditions on the semantic differential and thermometer scales. In addition, people with high shame would have greater positivity towards skin conditions, as they would be responding in a socially desirable manner.

The semantic differential did not have any significant correlations with the individual difference measures. There was a small significant correlation with the thermometer scale indicating a relationship between the components they were measuring. The thermometer scale had statistically significant correlations with internal shame and internal motivation. This indicated that decreased preference for clear skin was associated with higher levels of internal shame and motivation. In terms of motivation this result highlights that a participants internal motivation does have an impact on the explicit attitudes they report; however it is unclear how this would translate to their behaviour. The relationship between the thermometer scale and internal shame supports the hypothesis, as it was thought that participants who had high shame would respond in a socially desirable manner. The hypotheses regarding disgust and appearance concern were not supported within this study.

The thermometer scale is a crude measure of attitudes towards skin conditions because it asks participants to rate how they feel about all people with clear skin, and all people with skin conditions. Therefore it lacks subtlety and is hard for participants to complete. In addition, responses tended to fall into three categories rather than be normally distributed. This is likely to have an impact upon the results.

The first hypothesis was made in order to assess the role of specific cognitive and emotional factors that have been discussed in the literature, as likely to be involved in mediating adjustment or attitudes to visible difference (Covey, 1998; Park et al., 2003; Thompson and Kent, 2001; Thornhill and Gangestad, 1999). Such factors have also been postulated to make evolutionary sense. There is some support for the role of these factors; these results indicate that shame may influence explicit preference. However, as these measures are all explicit it is hard to ascertain at what level these responses are being activated. Further research needs to be completed in order to confirm the generalisability, reliability and validity of this result.

In terms of the second hypothesis, participants who did not know someone were most likely to express a preference for clear skin on the thermometer scale. Personally experiencing a skin condition did not have a significant impact on either of the explicit measures. This partially supports the hypothesis, participants who know someone with a skin condition had less negativity towards skin conditions, but effects of personal experience were not present. One possibility is that having experiences a skin condition does not affect attitudinal responses, this seems unlikely given that knowledge does have an impact. A second possibility is that the scales employed to look at explicit attitudes within the study were limited. The results within the scales were not normally distributed, which meant not only that interpretation of the analysis may not be generalisable but that the range of responses was limited. The development of a scale that assesses explicit attitudes on a range of components may have benefited this study. However, overall the explicit results indicate that knowledge and sham may both have an impact upon attitudes.

6.4.2 Implicit Association Test

The initial IAT related hypothesis predicted that participants would show a preference for clear skin. The results support this prediction and are in line with previous research (Grandfield et al, 2005). This result confirms the hypothesis and replicates those found in observational studies (e.g., Rumsey et al. 1982; also see 2.4.2), suggesting such reactions are implicit.

Second, it was hypothesised that participants who knew someone with a skin condition would demonstrate longer reaction times when responding to the IAT; particularly in the incongruent condition. However, participants who knew someone did not respond statistically any differently to those who did not. The interaction between having had a skin condition and knowledge was approaching significance on the IAT (p=.08). As there is high overlap between

the two groups it could be that people who have had a skin condition and those that know are at opposite ends of the spectrum to those who have not had a skin condition or know someone with a skin condition.

Finally, high disgust, shame and appearance ratings were expected to incur greater preference for clear skin. This hypothesis was not supported; none of these measures had an effect on implicit attitudes. It could be that these factors do not come into play at an implicit level especially if they are relatively low. Other factors, not measured in the current study, may affect the IAT instead, such as the valence or salience of appearance. The current study measured disgust, however a study by Park et al. (2003) assessed vulnerability to disease as they hypothesised that this was a factor underlying disgust that may be particularly salient to disability. It could be that measures specifically designed to look at skin conditions would produce better results. An alternative explanation is that these measures do not impact upon attitudes at an implicit level. It is possible that most people have a negative implicit reaction observable through the IAT, but that this only translates into an actual reaction (i.e., is made explicit) in people with high appearance concern, shame or disgust.

As there were no direct effects of knowledge or individual differences, interactions between the IAT, knowledge and the individual difference variables were examined. The results showed that knowing someone with a skin condition is associated with reduced preference for clear skin when participants score highly on positive self-esteem. Likewise, not knowing someone with a skin condition is associated with greater preference for clear skin when participants score highly on positive self-esteem. The literature on stigma suggests that one of its main functions was to raise the self-esteem of the stigmatisers (Dovidio and Gaertner, 2000) and that people with low self-esteem often hold the most negative attitudes (Duckitt, 1994). This result supports this when participants knew somebody but when they did not know someone this result appears to show the reverse. People with high self-esteem who do not know someone are associated with greater negativity towards people with a skin condition than those who do know someone. It could be that the IAT and the explicit measure of self-esteem measure different components, so someone with low self-esteem may be observed to be negative towards others but their implicit attitude does not match. A previous study exploring race (Frantz, Cuddy, Burnett, Ray, and Hart, 2004) using the IAT suggests that the IAT can be seen as an implicit threat and found that self affirmation protected against this, it could be that self-esteem has a similar effect. In Chapter 3 (3.4) different

theories were put forward to account for implicit and explicit attitudes. This result could support McConnell's (1997) theory that attitudes are context dependant. Participants knowledge of someone with a skin condition may determine context within the IAT, when looking at images of people with skin conditions, if the participant is familiar with skin conditions their implicit attitude may be seeing 'a person with a skin condition'. However, if they are not familiar with skin conditions, then when they look at the images, it may be that they see a 'skin condition' and do not see the whole person. Further research is needed to explore the relationship between self-esteem and implicit attitudes generally, before conclusions can be drawn.

Within this study, direct effects of knowledge were not apparent and only interactions with self-esteem produced significant results. In addition, the individual difference measures did not have an effect. This result is surprising and could indicate that there was a problem with the methodology, power or analysis. However, the methodology employed closely adhered to the structure set out by Greenwald et al. (1998) and replicated the study by Grandfield et al. (2005). Although the stimuli differed in the current study, they were all piloted to ensure that the stimuli were representative, stimuli numbers exceeded recent recommendations (Nosek et al., 2005). A number of questionnaire and explicit measures were used, the explicit measures were in line with numerous other IAT studies and the questionnaires employed had established reliability and validity. Screening of the data ensured there were no outliers, the normality of the scales, and reliability of the implicit measure. Analysis of data followed recommended guidelines (Greenwald et al., 1998) and further analysis assessed the effect of later proposed alternative analysis (Greenwald and Nosek, 2001) (see Chapter 5; 5.4.5.1). In terms of participant numbers, guidelines set out by Greenwald et al. (1998) were followed, power analyses were conducted apriori (see Chapter 5; 5.7) and post hoc (see Appendix 31). These were inline with a meta-analysis of 126 studies (Hofmann et al., 2005). The sample size also exceeded those in many other similar studies (e.g., de Jong, 2007; Huijding, 2005). Therefore, confidence in the methodology and analysis is ascertained and results should be reliable and representative.

Alternative explanations might be accounted for by exploring how the current study differed to Grandfield et al. (2005). There are a number of variations; additional tasks were added to this study. This could affect the results in two ways, the first is that participants may respond differently after completing several measures. The second is that counterbalancing the tasks may have had an effect on the IAT. Within this study, all participants completed the

appearance schema scale initially, however studies (Greenwald and Nosek, 2001) indicate that the IAT is sensitive to order effects. In addition, half of the participants completed the psychophysiology task and the SAM task before completing the IAT. In the previous study knowledge effects were attributed to stereotype inhibition in so far as participants might be inhibiting their automatic response. It could be that increased exposure to images of skin conditions eliminated the need for inhibition (though no significant differences between the groups were found).

Another way in which the current study differed was in the reporting of knowledge. In Grandfield et al. (2005) study, participants were asked to fill in a questionnaire, asking whether they had personally had a skin condition, if they knew anybody and whom they knew. However, participants provided limited information. Therefore, in order to obtain consistent results, each participant was asked verbally for this information. Also, the wording for one of the questions changed, within the first study participants were asked who they knew, all reported people were family or friends, but a considerable amount were not stated. This study specified; 'do you know anybody close to you', and asked separately if they knew anyone else. Participants who knew someone close to them specified someone, it is possible that the participants in the first study who failed to specify, knew someone in passing but were not close. The initial study lasted just 20 minutes whereas this study lasted over an hour, perhaps participants were more (or less) relaxed in this study which affected their responses. This study included fewer males than the initial study; as males accounted for a large amount of the effect, this may have influenced the current findings.

The correlation between the implicit and explicit measures was not significant, replicating Grandfield et al. (2005) and is in line with IAT studies generally (Karpinski and Hilton, 2001; Pruett, 2006; White, 2006) confirming that the IAT is measuring something different to explicit measures in relation to reactions to skin conditions.

The IAT in this study replicated the IAT in Grandfield et al. (2005) study, in that overall there was a preference for clear skin, however the effect of knowledge in this study was less straightforward. A number of factors have been suggested to account for this but further research needs to be conducted in order to ascertain which factors have this effect. In addition, whilst there is uncertainty regarding factors affecting the results, it is hard to generalise. This study fails to provide support for any relationship between attitudes and the evolutionary

theories. However, there were effects of knowledge, indicating that some change in implicit attitudes may be possible.

6.4.3 PSYCHOPHYSIOLOGY

6.4.3.1 HEART RATE

It was hypothesised that participants would have greater arousal and attention when viewing images of skin conditions. Participants with high scores on shame, disgust and appearance were predicted to exhibit greater arousal and attention on the psychophysiology. As participants who knew someone or had experienced a skin condition would already have exposure it was thought that they would have lower attention and arousal.

There were no significant differences in heart rate responses to clear skin and skin conditions within this study, nor was there a direct effect of knowledge, or of disgust, shame or appearance. When viewing images from the IAPS, participants responded in the manner expected from the literature (Lacey, 1967; Lang and Hnatiow, 1962). Heart rate responses also differentiated between the valence of the IAPS stimuli as is expected from the literature (Bradley et al., 1990; Hare, 1973; Lang et al., 1990). Participants had the greatest heart rate responses to the IAPS stimuli than to the images of clear skin and skin conditions. This indicates that heart rate was being measured accurately.

Apriori power analyses were completed for this study (see Chapter 5; 5.7 and Appendix 31) to ensure that there were adequate participants. The number of participants exceeded those used in numerous other psychophysiological studies (e.g., Vanman et al., 1997). The methodology, set-up of equipment and analysis followed other established procedures (Bywaters, 2004, Harrison, 1998), as well as those recommended by the manufacturers of the equipment. In addition the experimenter attended a training course in order to ensure analysis was correct. Similarly to the IAT, it is possible that other factors not measured here could be influential. This study aimed to assess the impact of shame, disgust and appearance measures; it is possible that these measures do not have an impact on heart rate.

One of the most likely reasons for the lack of psychophysiological response is that the images of skin conditions were not 'severe' enough. Images of different visible differences may produce larger responses. The images were mixed in with positive, neutral and negative images from the IAPS, it could be that the range of valence within those images overrode the impact of the skin conditions. Participants may have habituated to the stimuli. Although the

hypotheses were not supported, there was a significant difference in responses to the stimuli according to whether the participant had low or high self-esteem. Participants with low self-esteem had a greater initial deceleration, indicating the stimuli was more novel/attention demanding. Self-esteem may generally affect how participants respond to stimuli. Another interesting factor; participants showed less heart rate variation in response to the images of skin conditions and clear skin than to any of the sets of IAPS images, even though neutral images were selected due to their low arousal and valence. This suggests participants had an active divide in the attention they paid to the images of skin conditions. Changing the IAPS images so that people were a greater focus or altering the images of skin conditions and clear skin to be more interesting may impact responses.

There was a difference in participants' responses according to their implicit preference on the IAT task, high preference for clear skin resulted in greater heart rate deceleration when viewing skin conditions, whereas this trend was reversed for low preference for clear skin. Participants who preferred clear skin paid greater attention to skin conditions, indicating more interest. It could be that they had limited exposure to skin conditions. Park et al. (2003) found that people with most aversion were least likely to have friends with a disability. This suggests that the IAT and the psychophysiology tap into the same dimension at some level, adding to the reliability of the IAT as a measure of implicit attitudes and automatic responses.

The response parameter analysis was used to look at the individual difference variables, this method of analysis looked at the greatest deceleration over a period of seconds in order to screen out individual differences in physiological responding, and look at global responses (Siddle and Turpin, 1980). There were two main findings. First, participants with high external motivation had greater initial deceleration when viewing skin conditions, indicating the participants were paying more attention to the stimuli. Increased attention could indicate greater interest or novelty, so it could be that those who are externally motivated have less contact with skin conditions. Second, people with high implicit preference for clear skin on the IAT had greatest deceleration at time two when viewing skin conditions and people with low preference for clear skin had a greater deceleration when viewing clear skin. This finding is consistent with the IAT finding above. This could support literature suggesting that implicit responses are due to ease of processing (e.g., Reber et al., 2004, Whittlesea, 2001). Preference for clear skin on the IAT could indicate that these images were easier to process, whereas greater deceleration for skin conditions on the

psychophysiology indicates novelty, and thus harder processing.

Overall, the heart rate data failed to find effects of individual differences or knowledge. The study also failed to find a significant difference between images of clear skin and skin conditions; strongly indicating that the stimuli were not evocative enough. Heart rate interacted with the IAT, suggesting that they were both measuring a similar component. This is an important finding as it lends credence to the idea that the IAT is tapping into the automatic response. Also similarly to the IAT task, there was an overall effect of self-esteem when viewing stimuli.

6.4.3.2 ELECTROMYOGRAPHY

It was anticipated that there would be greater activation of the corrugator supercilii when viewing skin conditions and less activation of the zygomaticus major when viewing clear skin. It was also predicted that the levator labii muscle would be activated when viewing skin conditions (Park et al., 2003; Vrana, 1993). High disgust and appearance ratings were expected to produce greater arousal, and negative valence when viewing skin conditions; whereas experience was expected to reduce reactions to stimuli.

When examining just clear skin and skin conditions, there were no effects of any of the individual difference variables. There were also no effects of experience. However, when viewing the IAPS images; the corrugator supercilii was most highly activated when negative images were viewed and there was reduced activation for positive images. This result is concordant with the literature and indicates that this muscle site was accurate in its measurement (Bradley, Greenwald et al., 1993; Ekman and Friesen, 1986). However, the zygomaticus had greater activation for negative images than for positive images, contrary to expectations drawn from the literature. Also, contrary to the literature there was greater activation of the zygomaticus major for neutral stimuli than for either positive or negative (Bradley and Lang, 1993; Schwartz et al., 1979). This suggests that this muscle site was either measuring another muscle or that signals from other electrodes were interfering with this electrode. No levator labii activation was found in response to the skin conditions. The negative stimuli only contained two disgust images and both were associated with blood, in order to ascertain that the site was accurately measuring disgust, another study could be run with a group of images selected specifically to represent disgust.

Overall, the EMG data is disappointing, there was a lot of 'noise' in the signals

and it appears that two of the muscle sites were not working accurately. It is consequently difficult to draw conclusions.

6.4.3.3 Self Assessment Mannequin and Rating Scales

Ratings on the SAM indicated that IAPS images were having the predicted effect (Bradley and Lang, 1994). The clear skin and skin condition stimuli produced low arousal and low valence; ratings were on a par with neutral IAPS images. Clear skin was the least arousing, possibly because participants regularly see faces with clear skin. In terms of their arousal and valence, the images included do not affect participants; this may also explain why they had such limited effects on the EMG and heart rate measures. However, the arousal and valence ratings for them were significantly different to each other, perhaps explaining some of the effects seen, particularly in heart rate.

Males rated skin conditions as less attractive than females, but they also rated clear skin as less attractive (though not significantly), perhaps this is a general indication that attractiveness may not be so salient to men.

6.4.4 Disgust, Shame and Appearance

With respect to the IAT and the psychophysiology, the measures of disgust, shame and appearance had no significant impact. Looking at the measures together, there were high correlations between them suggesting an association; it could be that taking care of appearance is linked to cleanliness and thus disease avoidance. Disgust has been shown to be a factor in anorexia nervosa (Troop, Treasure, Serpell, 2002). Future research could investigate this further by including a vulnerability to disease questionnaire (Park et al., 2003) and seeing how disgust, appearance and shame relates to it. It is important to see if this result is replicated within a clinical population as it could suggest that existing models that do not account for disgust are missing something. Further exploration of this area may also lead to interventions that are more specifically targeted.

The study also found that males had significantly lower scores on the appearance scales, disgust and internal motivation than females. Unlike the study by Grandfield et al. (2005), gender effects were not present for any of the other measures.

6.4.5 Limitations

There are a number of limitations to this study. The first is that despite the IAT being used in a vast array of studies, there is still some ambiguity regarding the

interpretation of it. However, the relationship between the IAT and heart rate enhances the credibility of the IAT. As the heart rate deceleration was immediate, this suggests that the response to the stimuli is automatic and occurring at a level outside consciousness. Therefore, an interaction with the IAT indicates that both measures are detecting an immediate automatic response. The results for the psychophysiology were limited, particularly with respect to the EMG. In addition, participants saw the IAPS images and the skin condition stimuli first then completed the SAM; this may have affected their overall ratings. Each picture on the SAM could be rated after viewing instead, though this prolongs the psychophysiology, may disrupt the electrodes and lead to greater habituation effects.

The stimuli used within this experiment were selected because they represented skin conditions, and similar stimuli had been used successfully in a previous study. However, ratings on the SAM and responses on the psychophysiology suggest that the images were not highly arousing. Using stimuli of more noticeable or severe visible differences may have elicited a greater response, and allowed any relationship with the individual difference variables to have emerged. The explicit measures used within this study were the thermometer and semantic differential scales. A scale designed specifically to assess attitudes to skin conditions may also be beneficial.

Within the study, there was an overlap between people who had personally experienced a skin condition and people who know someone with a skin condition. Although, participants were asked if they had had a skin condition, it was difficult to gauge severity. All participants reported seeing a general practitioner, but the duration of the skin condition and the impact on their life was difficult to measure. The impact of personally experiencing a skin condition in the past may be different to currently having a skin condition. Future studies could recruit participants from dermatology clinics and match them with a control sample.

The participants were all undergraduates and largely female, which may limit the generalisability of the study.

6.4.6 Relationship to Visible Difference

The explicit measures and the IAT demonstrated an overall preference for clear skin, this is as expected from the literature (Bull and David, 1986; Heason and Kent, 2001; Kent, 2000; Newell and Clarke, 2000; Porter et al., 1990; Rumsey et al., 1982; Thompson and Kent, 2001; Thompson et al., 2002). The explicit

measures also showed some correspondence to shame and internal motivation. Participants with low internal motivation and high shame were more likely to show a preference for clear skin. Exploring the factors underlying internal motivation may lead to effective interventions. There was also an effect of knowledge on the thermometer scale such that knowledge was associated with decreased preference for clear skin. Knowledge and personally experiencing a skin condition was explored, however unlike the study by Grandfield et al. (2005) this did not have an impact on either the implicit or explicit measures. Evidence from the disability literature (Esses and Beaufoy, 1994) suggests that how 'blame' is attributed to the person with the disability has an impact on attitudes, this component was not explored. Developing an understanding of the factors participants attributed to skin conditions and whether they thought the participant had any control over them may have had an impact on the results.

In the Grandfield et al. (2005) study, males who knew someone with a skin condition took longer to respond on the IAT, indicating greater negativity or stereotype inhibition. However, within this study, males rated the images as less attractive suggesting that attractiveness was not a key component for them. To conclude, at an implicit and physiological level, this study has found limited support for the impact of shame, disgust and appearance schema. It would be interesting to explore these variables at an implicit level, perhaps adapting the IAT to look at disgust rather than personal likes and dislikes. However, at an explicit level there is evidence that internal shame does have an impact. There was also evidence that knowledge affects explicit attitudes. This element that should be explored further. In addition, further studies could try to rectify the problems with the psychophysiology in order to explore activation of the levator labii and its relationship to these variables in detail.

6.4.7 Overview

Overall, there was evidence that explicit attitudes are affected by shame. The current study did not find a relationship between shame, disgust or appearance schema at an implicit or physiological level. There are two possible reasons; the first is that attitudes are only affected by these variables at an explicit level. The second explanation could be that in order to look at the relationship to the IAT or psychophysiology, the variables also need to be measured in an implicit or physiological manner, and that the relationship to explicit measures, such as questionnaires is weaker. The results from the psychophysiology were not representative of other literature, which is most probably accounted for by measurement error, therefore future studies may help to clarify these results.

The results from the IAT differed to those found by Grandfield et al. (2005), effects of knowledge were not found within this study, nor were there effects of shame, disgust and appearance at an implicit level. A number of explanations were suggested for this; including there being fewer males in the study and participants having an awareness of what was being measured. However, there was an impact at an explicit level. This suggests that knowledge does have some impact upon attitudes.

Nonetheless, this study found some interesting effects, particularly that heart rate was related to the IAT, this offers support to the validity of the IAT, suggesting that at some level they are both measuring the same or closely related phenomenon. Self-esteem also had an interaction with the IAT, suggesting this may be a factor influencing attitudes. Self-esteem features within the prejudice literature, and the finding in relation to visible difference could help people with a visible difference to normalise and understand the behaviour of others. In addition, the explicit measures varied according to shame and internal motivation, there was also an effect of knowledge; implying that at some level attitudes towards people with a visible difference are affected by these measures, which is commensurate with some of the explanatory models discussed previously.

Chapter 7: Study 2; Personalising the Implicit Association Test

7.1 Introduction

The implicit association test was developed to measure a person's implicit associations regarding an attitude topic; initially racism, but a whole variety of areas have been explored since. Whilst the IAT has always shown clear preferences for one group over another (e.g., Greenwald et al. 1998, 2001), usually manifested in expected or easily explainable ways, there has been much controversy over whether the IAT is measuring personal or societal views. This has mainly been compounded by low correlations between implicit and explicit errors and manipulations affecting responses on the IAT.

In Chapter 3 (3.4), the literature review outlined the theory that the implicit attitude is an indicator of the explicit attitude before other elements such as, feelings, cognitions and expectations influence it (Devine et al., 2002). Therefore, it would be anticipated that in the right circumstances the implicit and explicit attitude would be similar (have high correlations). This is likely to be when there are few external influences to the explicit attitude such as high societal expectations or feelings toward the attitude object.

However, studies looking at objects with low social bias have found few correlations. For example, one study looked at implicit attitudes to candy bars and apples, though the IAT showed a preference for apples, when offered a choice of a candy bar or an apple at the end of the experiment, most participants chose the candy bar, showing very little correlation between the two (Karpinski and Hilton, 2001). The authors postulated that this was because the IAT was measuring societal rather than personal views of the constructs; society views apples as healthy whereas the participant actually preferred candy bars. Similarly, studies looking at smokers' attitudes toward smoking have found that although explicitly they may say they enjoy smoking, implicitly their attitudes are negative (Swanson, Rudman, and Greenwald, 2001). This could also help to explain how manipulations to race IATs, i.e., changing the experimenter from a white person to a black person affected responses (McConnell and Leibold, 2001). It could be that the changes made different elements such as societal or personal views more salient.

Olson and Fazio (2004) made some minor alterations to the IAT such that 'unpleasant' was changed to 'I don't like it' and 'pleasant' was changed to 'I like it', this has the effect of personalising the IAT. Rather than thinking in global

terms, the participant is forced to think in terms of themselves. A series of four studies shows marked improvements in the strength of the correlation between implicit and explicit measures and concludes that personalisation in this way offers a much clearer view of the individual's personal attitudes rather than being contaminated by societal values. An additional method of eliciting personalised responses has been implemented, this involved making the participants think about themselves before completing the IAT (Perugini et al., 2007).

This study was designed to test a personalised variation of the IAT. Grandfield et al. (2005) used the IAT with undergraduates and found that students who reported knowing someone with a skin condition showed signs of stereotype inhibition on the IAT, such that they took longer to respond. It was thought that the participants who knew somebody were trying to inhibit their personal views in order to complete the IAT, and the process of doing this extended their reaction times. Whereas the participants who did not know anyone used their societal stereotypes and responded faster. In Chapter 6 (6.3.6), the IAT did not display any direct effects of knowing somebody or of personally experiencing a skin condition, but it was felt that this was because there were more tasks involved, and due to counterbalancing some participants were exposed to similar images before they completed the IAT, whereas others were not.

The personalised IAT aims to identify individuals' attitudes rather than societal values (Nosek and Hansen, 2004). Further support for personalising the IAT, was found in a replication of the smokers' attitudes study (Swanson et al., 2001) Using the personalised IAT, this study found contrary to traditional IAT research, participants did display positive implicit attitudes toward smoking (De Houwer, 2006). Given this evidence, it was hypothesised that using the personalised IAT to measure participants' attitudes towards skin conditions would elicit personal views and as such stereotype inhibition should be reduced.

7.1.1 Aims

There were three main aims to the study. The first aim was to assess whether stereotype inhibition is reduced as a result of using the personalised IAT. This would be indicated by the group that know someone either having no difference in reaction times to the group that do know someone or by their reaction times being faster. The second aim was to look at differences between the personalised and traditional IATs. The final aim was to replicate the findings in Grandfield et al. (2005) study with regard to the traditional IAT.

7.1.2 HYPOTHESES

There were three main hypotheses within this study. First, participants will show a preference for clear skin (as found by Grandfield et al. (2005) and in Chapter 6; 6.3.6). Second, there will be a difference between the traditional and personalised IAT with respect to knowledge effects. Specifically, the traditional IAT will replicate the effects found by Grandfield et al. (2005) with regard to extended reaction times when the participant knew someone, and that this effect would not occur within the personalised IAT. Third, the personalised IAT will have stronger correlations between the implicit and explicit measures, as a high correlation between the two may indicate personal rather than societal views.

7.2 METHOD

7.2.1 DESIGN

This study was a two by two design. Participants were selected according to whether they knew someone close to them with a skin condition or not, they were then split into two groups, one of which completed the personalised IAT and the other which completed the traditional IAT (see Table 7-I).

7.2.2 MEASURES

7.2.2.1 QUESTIONNAIRES AND EXPLICIT MEASURES

This study aimed to adhere to the format used by Grandfield et al. (2005) as closely as possible, but also rectify some of the problems concerning the limitations of the explicit measures. The questionnaires used in this study are the IMS/EMS, the feeling thermometer, semantic differential and demographic variables, these measures all address the explicit component of attitudes. Complete details of these measures are in Chapter 5 (5.2.3.1, 5.3.1, 5.3.2, 5.3.3).

7.2.2.2 IMPLICIT ASSOCIATION TEST

Target stimuli used within the IAT were Set One photographs (Appendices 19 and 20). As the psychophysiology task was not used within this study and no significant differences had been found between the two sets of images in Chapter 6 (6.3.6), there was no need to counterbalance the pictures. Therefore, it made sense to exclude one of the picture sets to reduce counterbalancing criteria. All other stimuli remained identical and can be reviewed in Chapter 5 (5.4.1 and 5.4.2).

In order to personalise the IAT, the attributes 'pleasant' and 'unpleasant' were replaced with 'I like it' and 'I dislike it'.

7.2.3 PROCEDURE

Participants were recruited via a poster on the University of Sheffield psychology department notice board (see Appendix 29 for an example). Participants signed up according to whether they knew someone with a skin condition or not (see Table 7-I). They were offered course credit for their participation. Participants were then randomly assigned to either the personalised or traditional IAT.

Table 7-I: Breakdown of Participants per Group

	Know Someone	Don't Know
Traditional	21	22
Personalised	22	22

After explaining the purpose of the experiment, and obtaining consent (Appendix 3) the participant completed the IAT. They were then given the questionnaires to complete and asked the demographic questions. Participants were then given an opportunity to ask any questions and received a debrief sheet (Appendix 4).

7.3 RESULTS

7.3.1 PARTICIPANTS

Eighty-Seven (75 female and 12 male) undergraduate students within the University of Sheffield volunteered to take part in the experiment. The low number of males within the study reflects the population within the psychology department. Their ages ranged from 18 to 27 ($\bar{x}$ =19.37, σ =1.32).

7.3.2 DEMOGRAPHIC MEASURES

The participants in this study were screened such that half knew (*n*=41) someone with a skin condition and half (*n*=46) did not. Within the group that knew someone, 26 people had personally had a skin condition. Within the group that did not know someone three people had personally had a skin condition (these three people did not differ to the rest of the group statistically). Overall the types of skin conditions experienced by people known to them were eczema (39%; *n*=16), acne (22%; *n*=9), psoriasis (32%; *n*=13) and other (i.e., allergies, birthmarks) (7%; *n*=3). These conditions were experienced by siblings (34%; *n*=14), friends (27%; *n*=11), parents (24%; *n*=10), close family i.e., aunt,

grandparent (7%; *n*=3), and partner (7%; *n*=3). Eighty eight percent (*n*=36) of these people's conditions were ongoing. The conditions experienced by the participants were eczema (59%; *n*=17), acne (38%; *n*=11) and psoriasis (3%; *n*=1). The areas affected by these conditions were face and hands (45%; *n*=13), limbs (38%; *n*=11), torso (7%; *n*=2) and all over (10%; *n*=3). Fifty eight percent of these participants (*n*=17) reported their skin condition as ongoing.

7.3.2.1 Summary of Scales; Reliability and Normality

Scales were checked for normality looking at skewness, kurtosis and Shapiro Wilk values (as in Study 1; 6.3.4.1). The thermometer and semantic differential did not meet assumptions for normality on any of the tests. Therefore, the scales were categorised into preference for skin condition, preference for clear skin and no preference, as in Study 1 (Chapter 6). The IMS/EMS scale met normality assumptions and had good reliability (Cronbach alpha: IMS; .73, EMS; .83).

7.3.3 Explicit Measures

The means for the semantic differential ($\bar{x}$ =2.01, σ =2.48) and the thermometer scale ($\bar{x}$ =.59, σ =1.43) indicated an overall preference for clear skin. The ratings given on the thermometer scale broke down into a preference for skin conditions (8%; *n*=7), no preference (45%; *n*=39) or a preference for clear skin (47%; *n*=41). Ratings given on the semantic differential had a similar pattern; 9% (*n*=8) preferred skin conditions, 19% (*n*=16) displayed no preference and 72% (*n*=63) preferred clear skin.

7.3.3.1 Effects of Knowledge, Personal Experience and Gender

Initially one-way ANOVAs were used to ascertain whether there was a difference in scores on the thermometer and semantic differential scales according to whether people knew somebody with a skin condition or whether they had personally experienced a skin condition. Participants who did not know someone had significantly lower scores on the thermometer scale ([$F(1,85)=6.3$, $p<.05$], don't know: $\bar{x}$ =-.95, σ =1.16; know $\bar{x}$ =-.2, σ =1.58) but this was not significant for the semantic differential [$F(1,85)=.05$, $p=.83$]. This indicates that they displayed greater preference for clear skin on the thermometer scale if they did not know someone with a skin condition. Personally experiencing a skin condition had a significant impact on the thermometer scale ([$F(1,85)=5.22$, $p<.05$], no personal experience: $\bar{x}$ =-.83, σ =1.23; personal experience $\bar{x}$ =-.1, σ =1.67) but not on the semantic differential [$F(1,85)=.73$, $p=.39$]. Participants

who had experienced a skin condition had higher scores on the thermometer scale, indicating lower explicit preference for clear skin. Gender effects were also explored. There were no statistically significant differences between males and females for the thermometer scale [$F(1,85)=1.7$, $p=.2$] or the semantic differential [$F(1,85)=.71$, $p=.39$].

7.3.3.2 CORRELATIONS BETWEEN EXPLICIT MEASURES AND MOTIVATION

Figure 7-I shows Pearson's correlations between the explicit measures and the motivation scale. The thermometer scale has a statistically significant correlation with external motivation ($r(86)=-.29$, $p<.01$).

Figure 7-I: Correlations; Explicit Measures & Motivation

	Internal Motivation	External Motivation	Thermometer
Thermometer	.18	-.29**	
Semantic Differential	.14	.01	.13

* $p<.05$ ** $p<.01$

7.3.4 THE IMPLICIT ASSOCIATION TEST

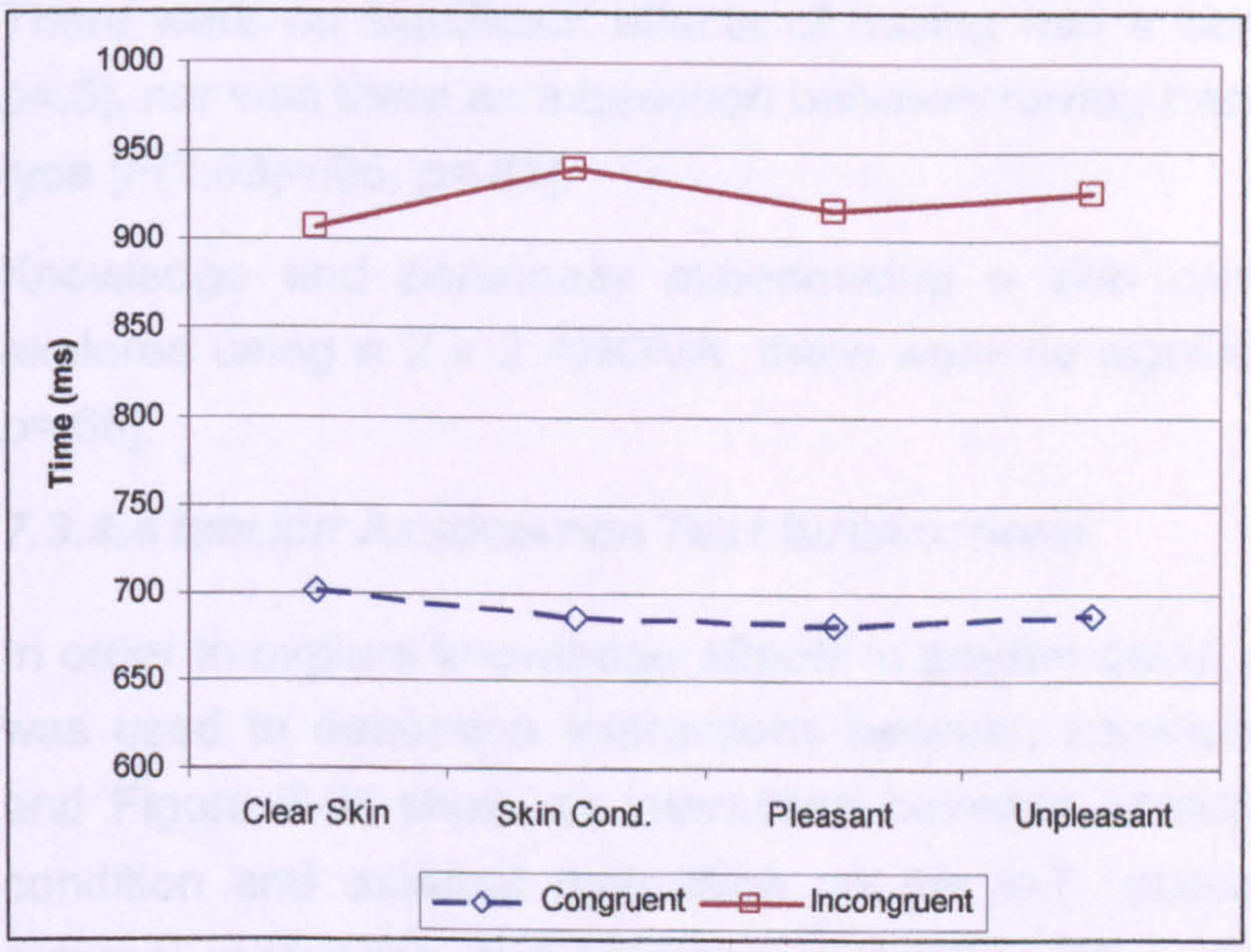
7.3.4.1 DATA REDUCTION

Data was reduced as described in Chapter 5 (5.4.5). Reaction times recoded to 3000ms accounted for 7% of the total, and one reaction time was recoded to 300ms. The average error score for the IAT was 4.9%, which is on a par with previous IATs, no one was removed from the analysis due to a high error rate.

7.3.4.2 OVERVIEW

From Figure 7-II it is evident that the congruent condition had faster reaction times across all four components of the construct (pleasant/I like it, unpleasant/I dislike it, clear skin, skin condition). In line with recommendations made by Greenwald et al (1998), a one-tailed t-test was conducted, which indicated that these results were significant ($t(87)=12.53$, $p<0.001$). Participants showed a preference for clear skin over skin conditions.

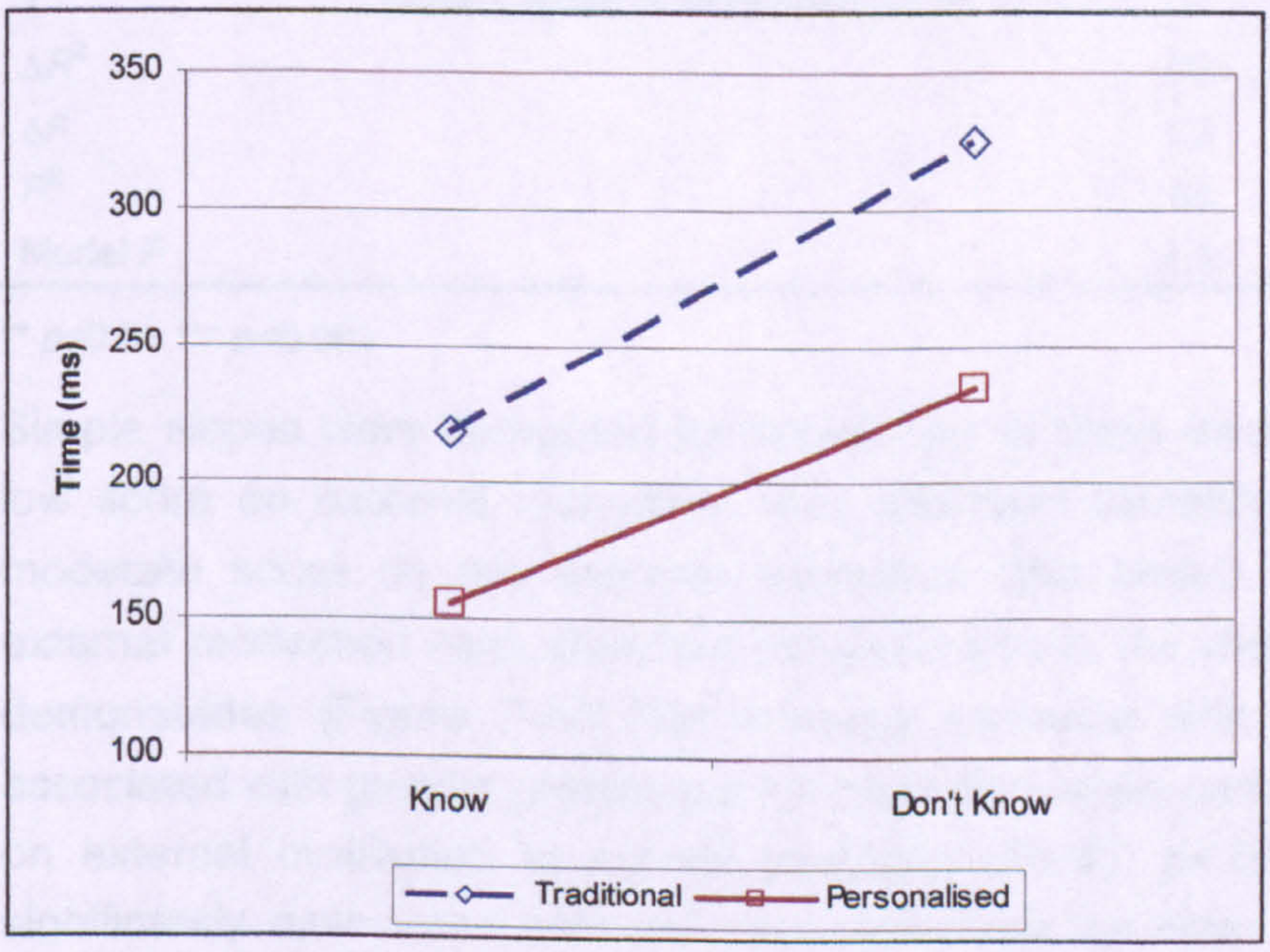
Figure 7-II: Reaction Times in Milliseconds for Congruent and Incongruent Responses.



7.3.4.3 Analysis of Variance

A two-way between group ANOVA was conducted to explore the type of IAT (personalised/traditional) and knowledge effects (know/do not know) on IAT reaction times. There were no significant effects of IAT type [$F(1,83)=3.47$, $p=.07$], or of knowledge [$F(1,83)=.45$, $p=.51$], nor was there an interaction between the two [$F(1,83)=.005$, $p=.94$]. Figure 7-III shows the reaction time differences on the IAT.

Figure 7-III: IAT Difference Times across Conditions



A two-way between group ANOVA was conducted to explore the type of IAT

(personalised/traditional) and having had a skin condition on IAT reaction times. There were no significant effects of having had a skin condition [$F(1,83)=.27$, $p=.6$], nor was there an interaction between having had a skin condition and IAT type [$F(1,83)=.05$, $p=.83$].

Knowledge and personally experiencing a skin condition interactions were explored using a 2 x 2 ANOVA, there were no significant effects [$F(1,83)=.02$, $p=.68$].

7.3.4.4 Implicit Association Test Interactions

In order to explore knowledge effects in greater detail, a hierarchical regression was used to determine interactions between knowledge and EMS. Table 7-II and Figure 7-IV show an interaction between knowing someone with a skin condition and external motivation on the IAT results. Table 7-II shows that external motivation and knowing someone with a skin condition on its own accounted for just 3% of the variance in the IAT, the addition of the interaction term contributed a significant increment in the variance; 12% ($\Delta R2$ =.12, $p<0.001$).

Table 7-II: Hierarchical Regression of IAT on Knowing Someone with a Skin Condition, External Motivation and Interaction Term

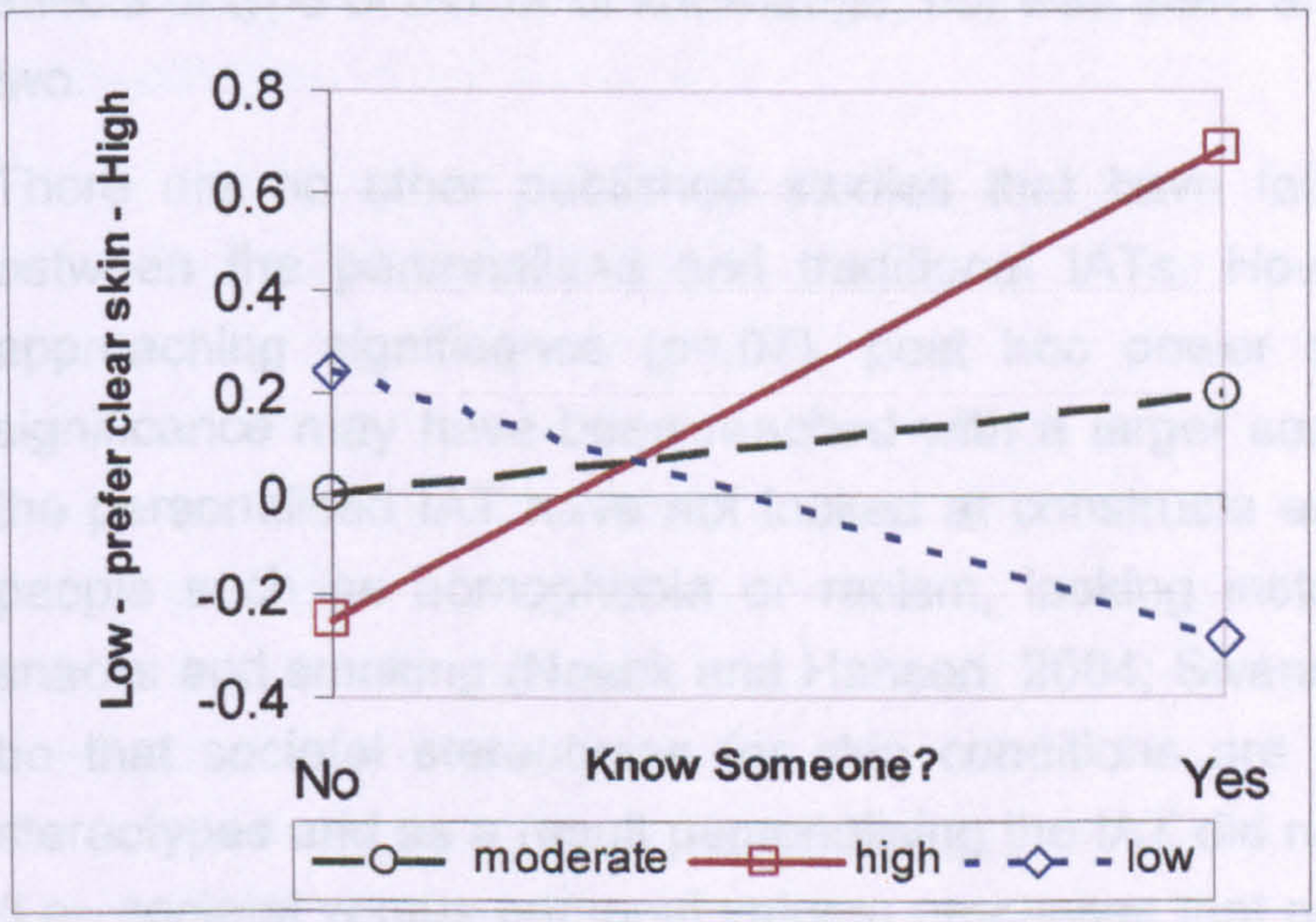
Step	Variable Entered	β	β
1	External Motivation Scale	.165	-.24
1	Know	.114	.103
2	Know x External Motivation Scale	—	.535***
ΔR^2		.03	.12
ΔF		1.3	11.83***
R^2		.03	.15
Model F		1.3	4.92**

** $p<0.01$ *** $p<0.001$

Simple slopes were computed for knowledge at three levels of the moderator; low score on external motivation (one standard deviation below the mean), moderate score on the external motivation (the mean) and high score on external motivation (one standard deviation above the mean). The interaction demonstrates (Figure 7-IV) that knowing someone with a skin condition is associated with greater preference for clear skin when participants score highly on external motivation to control prejudice ($\beta=.93$, $\rho<.01$) but is marginally significantly associated with reduced preference for clear skin when external motivation is low ($\beta=-.53$, $\rho=.08$). At moderate levels of external motivation,

there is no significant association between knowing someone and preference for clear skin (β=.21, ρ>.05).

Figure 7-IV: Interaction Between Knowing Someone with a Skin Condition, External Motivation: Simple Slopes for Knowledge at Three levels of EMS



7.3.5 Correlations Between the Implicit Association Test and Explicit Measures

Correlations between the IAT, the semantic differential and the thermometer scale were conducted. The data file was split so that these could be compared between the traditional and the personalised IAT. None of the correlations were significant. The IAT correlation with the thermometer scale changed from a positive correlation (r(43)=.12, p>.05) on the traditional IAT to a negative correlation (r(44)=-.12, p>.05) on the personalised IAT. This was not statistically significant (z=1.21, p=.11; calculated using Lowry, 1998)

7.4 Discussion

The aims of this study were to assess whether the personalised IAT reduced stereotype inhibition and to explore the differences between the personalised and traditional IATs. The final aim was to replicate the findings in Grandfield et al. (2005) study with regard to the traditional IAT.

7.4.1 Discussion of Hypotheses

In line with previous research (Grandfield et al, 2005; Study 1 in Chapter 6) this study supports the first hypothesis by demonstrating that participants showed a preference for clear skin over skin conditions.

The second hypothesis predicted a replication of the results found in the study

by Grandfield et al (2005). Specifically, if the participant knew someone with a skin condition, reaction times would be longer for those completing the traditional IAT compared to those completing the personalised version. A 2 x 2 ANOVA was unable to demonstrate an effect, the study found no significant effects of type of IAT or of knowledge, nor was there an interaction between the two.

There are no other published studies that have failed to find a difference between the personalised and traditional IATs. However, type of IAT was approaching significance (p=.07), post hoc power analysis suggested that significance may have been reached with a larger sample. Studies examining the personalised IAT have not looked at constructs associated with groups of people such as homophobia or racism, looking instead at lifestyle choices; snacks and smoking (Nosek and Hansen, 2004; Swanson et al., 2001). It could be that societal stereotypes for skin conditions are low or akin to personal stereotypes and as a result personalising the IAT did not change the underlying (i.e., societal versus personal values) processes that people used to categorise the stimuli. This is supported by the mean reaction times; the personalised IAT showed the same trend as the traditional IAT, reaction times were slower when participants knew somebody. However, reaction times on the personalised version were faster overall, indicating that personalisation made the task easier. This supports the aims of Olson and Fazio (2004), they would argue that this is because participants were responding from a personal perspective rather than a global one. However, it is also possible that the change of phraseology made the task more obvious, and thus enabled participants to respond from a more explicit perspective.

In terms of knowledge effects, this IAT showed similar results to Study 1, there were no significant differences between people that knew someone and those that did not, though the direction of the means was similar to Grandfield et al. (2005) study. There are two possible explanations for the lack of knowledge effect. The first is that participants knew that the study was about skin conditions, as they were recruited according to whether they knew someone with a skin condition. Also in Chapter 6, they had knowledge that the study was looking at appearance before completing the IAT. It could be that knowledge of what was being measured affects overall results, similarly to IATs examining race that have manipulated the race of the experimenter (McConnell and Leibold, 2001). In the Grandfield et al. (2005) study the participants were not made aware of what was being measured, they were just told it was a reaction time task. Overall the reaction times within this study were slightly slower than

in Grandfield et al. (2005), this could be an indication of greater cognitive effort. The second possible explanation is that the current study and Study 1 involved fewer male participants. Males accounted for more of the effect in Grandfield et al. (2005) suggesting that increasing the proportion of males within the study may change the overall results. There were not enough males within this study to reliably test for gender effects.

As with Grandfield et al. (2005) and Study 1, this study showed no difference within the reaction times of the IAT results if someone currently had a skin condition or had had a skin condition in the past. However, like Study 1 but unlike Grandfield et al. (2005) this study also showed no direct difference between knowing someone with a skin condition and not knowing someone with a skin condition. It is worth noting the high crossover between the two groups, within the 'know' condition 68% of participants had had a skin condition, whereas in the 'don't know' condition only 6% had had a skin condition. It is possible that participants who had had a skin condition were more likely to be aware of skin conditions in others.

Whilst this study did not find significant differences between people who knew somebody with a skin condition and people who did not, there was an interaction between knowing somebody and the external motivation scale. This was such that when someone had high external motivation to respond without prejudice and they knew someone with a skin condition, they had greater preference for clear skin on the IAT, however when they did not know someone this was the reverse. People with low external motivation showed the opposite trend, when they knew someone they showed less preference for clear skin on the IAT. Using stereotype inhibition (Grandfield et al., 2005) as an explanation, highly externally motivated people may be motivated because they know someone, and as such inhibit their prejudice on the IAT, whereas highly externally motivated people who do not know someone may have less difficulty suppressing their stereotypes. This is supported by Hausmann and Ryan's (2004) study which found that external motivation was linked to greater bias on the IAT. Someone who has low external motivation may already have internalized their views of someone with a skin condition, therefore their times are faster when they know someone. However, participants showed a similar trend to Study 1; they took longer to respond to the IAT if their external motivation was high. This indicates that participants may not have been trying to inhibit stereotypes but rather their own personal reactions.

There are two ways of considering attitudes to skin conditions, one is how

participants perceive the person with the skin condition and the second is how participants perceive the skin condition itself. If participants are responding to the skin condition then they may consider them to be negative. It is possible that different aspects are salient in different circumstances; when the participant has no knowledge of skin conditions, they perceive the person and the skin condition as the same (i.e., a person with a skin condition) but when they do have knowledge, the judgement may be based on the skin condition. This would account for some of the disparity between the implicit and explicit measures; the explicit measures directly ask how they feel about people with skin conditions as a group.

The final hypothesis predicted that the personalised IAT would have stronger correlations between the implicit and explicit measures, as a correlation between the two may indicate personal rather than societal views. The correlations between the IATs and the explicit measures were not significant but were in opposite directions; the traditional IAT correlated positively with the explicit measures whereas the personalised IAT correlated negatively suggesting that the traditional IAT is a better measure of personal attitudes than the personalised IAT. However, this could be further support for the theory that participants were able to control their implicit attitude in light of the information available to them, so whilst the attitude is similar to the explicit attitude, this is due to the IAT no longer measuring at an implicit level. These suggestions are speculative given the low level of statistical significance. It is likely that this is because there were no significant differences found between the two IATs. Therefore, correlations with other measures would not differ either.

7.4.2 Interaction Between the Implicit Association Test, External Motivation and Knowledge

ANOVAs were used to look for an interaction between knowledge and the external motivation scale, and their effect on implicit attitudes. The resulting interaction demonstrated that knowing someone with a skin condition is associated with greater preference for clear skin when participants score highly on external motivation. Not knowing someone with a skin condition is associated with reduced preference for clear skin when external motivation was high. This could indicate stereotype inhibition, as when looking at skin conditions it took them a long time to categorise it.

7.4.3 Explicit Measures

The thermometer and semantic differential measures were used to assess

explicit preference. Limited consistency between the measures was found. The explicit measures demonstrated an overall preference for clear skin followed by participants who stated 'no preference'. This is in line with Grandfield et al. (2005) and Study 1. It is also indicative of the implicit measure, however the correlation between the implicit and explicit measure is not significant. This is representative of numerous other studies (e.g., Pruett, 2006). In a meta-analysis of 124 studies, Hofmann et al. (2005), found consistently low correlations, they suggested additional factors may affect explicit measures.

In line with Study 1, participants who did not know someone with a skin condition had greater preference for clear skin on the thermometer scale. Similarly, but unlike Study 1, participants who had personally experienced a skin condition had less explicit preference for clear skin on the thermometer scale. This indicates that increased exposure to skin conditions reduces negativity in explicit attitudes. However, the nature of the questioning does not allow the exact components of the 'exposure' to be measured.

The thermometer scale had a significant negative correlation with external motivation. This suggests decreased preference for clear skin is associated with increased external motivation. Also within this study external motivation had an interaction with knowledge in terms of the IAT. In Study 1, internal motivation was associated with decreased preference for clear skin. These results indicate that the participants motivation may be an important factor in their overall attitude. However, it could be that their attitude influences their motivation,

7.4.4 Implications for Visible Difference Research

The focus of this study was restricted to methodological components within the IAT and looking at the effect of knowledge on attitudes. There was no relationship between knowledge and personally experiencing a skin condition at either an implicit level, but at an explicit level knowledge and personal experience were associated with explicit preference. Explicit preference for clear skin was lower within participants that knew somebody with a skin condition or had personally experienced a skin condition. Motivation also featured within the results; there was an interaction between motivation and implicit attitudes, and high external motivation was associated with decreased explicit preference for clear skin. If motivation influences attitude, rather than vice versa, gaining additional understanding of motivation may allow further interventions to be implemented. In addition, this study offers support to interventions that increase the public's knowledge of visible difference.

An overall preference for skin conditions was as predicted and is in line with the literature looking at responses to and experiences of participants with a visible difference (Bull and David, 1986; Clarke, 1999; Heason and Kent, 2001; Kleck et al., 1968; Porter et al., 1990; Rumsey et al., 1982; Snyder and Endelman, 1979; Thompson et al., 2002).

7.4.5 LIMITATIONS

There are two major limitations of the study, the first is that the sample was a convenience sample recruited within undergraduates, this restricts the generalisability of the study as it is likely the sample is non-representative. Also attitudes exhibited when physically with a person who has a visible difference or skin condition are likely to be different to looking at images when alone.

The methodologies used within this study were robust, and the results replicated those found in Study 1. However, the results from the IAT can be difficult to interpret. An example of this is in Grandfield et al. (2005) study where rather than faster reaction times when participants knew somebody they were longer. Therefore, interpretation could either be that they have greater prejudice or that they are exhibiting stereotype inhibition. In relation to the literature, the latter explanation was deemed most likely. However, in this study, there was an interaction between external motivation and knowledge, in which case longer reaction times were interpreted as greater negativity, as this represents other literature in the field.

An additional limitation is that within the IAT, it is uncertain whether participants are responding to images and seeing someone with a skin condition, or whether they are responding to skin conditions as an item. One way of exploring this may be to use a non-pictorial IAT, using names of skin conditions and see if the results replicate those within these studies.

Within this study, participants were aware that skin conditions were the area of interest and this may have affected their responses on the IAT. Also, there were fewer males within this study, as males accounted for a greater proportion of the effect on the IAT in the study by Grandfield et al. (2005), this may account for the difference in the results.

7.4.6 CONCLUSION AND FUTURE RESEARCH

To conclude, this study replicated the overall preference for clear skin found in the study by Grandfield et al. (2005) and within Study 1. It also replicated the association between knowledge and the explicit attitude. In addition this study

found a relationship between explicit attitudes and personally experiencing a skin condition. Future research could look at this effect in greater depth by comparing a clinical population with a control group to ascertain whether this relationship extends to other measures, for example, the IAT.

This study failed to find significant differences between the traditional and personalised IAT, although there was evidence that this was approaching statistical significance. As there was not an interaction with knowledge, it is recommended that future studies looking at skin conditions continue to use the traditional IAT. The traditional IAT has greater reliability and validity within the literature and can be compared to a greater amount of studies for interpretation. This study also failed to replicate the knowledge effects within the IAT found by Grandfield et al. (2005). This may be the consequence of the small number of male participants recruited to this study, future studies could explore gender effects within the IAT. This study also found an association with motivation and the explicit measures, suggesting that this element may be relevant to further research.

Chapter 8: Study 3; Gender Differences in the Implicit Association Test

8.1 Introduction

The IAT has been used to assess attitudes to skin conditions within three studies (Grandfield et al., 2005; Study 1; Chapter 6 and Study 2; Chapter 7). All of these studies have been consistent in that participants have shown an implicit preference for people with clear skin. In addition, gender effects were found in the initial study and in Study 1; they were not assessed in Study 2 due to the low number of males in the study. The initial study by Grandfield et al (2005) found that males responded faster to the images than females. Males were even faster than females when they knew someone with a skin condition. The study concluded that this could either be due to a difference in the way males processed information or that it could be due to males responding to image of females.

IAT studies in the literature have been inconsistent in their gender effects with the subject matter most affecting results. For example, females show greater anxiety (Egloff and Schmukle, 2004), and males show most bias in sexuality (Geer and Robertson, 2005). Therefore, it is likely that the difference observed is either due to a difference in male and female attitudes or is a result of the males responding to images of females. This could indicate an element of attraction. Study 1 found that generally males responded faster, however the stimuli were also of females. It is possible if the stimuli had been of males that females would have responded faster. In summary, the gender differences could either be due to males responding in a different way in comparison with females (e.g., they were faster in the congruent condition and slower in the incongruent condition particularly when they knew someone with a skin condition), males could hold different attitudes to skin conditions or the effect may have been due to the stimuli (all females). As there is very little on gender differences within the attitude literature and there are inconsistent findings with respect to gender responding on the IAT, this study aims to explore whether the use of male stimuli would reverse the gender effect observed in earlier studies.

Another factor that changed between studies is the knowledge effect. In the initial study there was a straight forward knowledge effect such that people who knew someone took longer to respond. Study 1 found an interaction between self-esteem and knowledge, and Study 2 found an interaction between external motivation and knowledge, but not within Study 1. It was felt that the knowledge

effect could have changed within Studies 1 and 2 because in both of these studies participants had an awareness of what was being measured. In Study 1, the tasks that the participants completed made it apparent; in Study 2 participants were recruited specifically according to whether they knew somebody who had personally experienced a skin condition.

This study was designed in order to replicate the knowledge effects of the Grandfield et al. (2005) study and to ascertain whether gender effects were a result of the stimuli or whether they were generic differences to skin conditions between males and female.

8.1.1 Aims

The aims of this study were to replicate the original study's straightforward knowledge effects, and to ascertain whether there is a difference in males and females responses to skin conditions or whether this differs according to the gender of the stimuli viewed.

8.1.2 Hypotheses

The hypotheses for this study were that the knowledge effects within the study by Grandfield et al (2005) would be replicated, such that it would take participants longer to respond to the stimuli if they know someone.

The second hypothesis was that gender effects would be due to the stimuli used within the IAT rather than males generally being different to females in their responses on the IAT (there is no literature supporting the latter). This meant that it was expected that females would be faster in the congruent condition than males when viewing males, and males would be faster in the congruent condition than females when viewing females.

8.2 Method

8.2.1 Design

The study was a two by two design; participants were either male or female and were randomly assigned to one of two conditions. In the first condition the participants saw the original female IAT, in the second condition they saw a new IAT with male pictures rather than female pictures. Also, like Grandfield et al. (2005) study, participants were not informed what the study was measuring in order that prior knowledge of the task would not affect responses.

8.2.2 MEASURES

8.2.2.1 QUESTIONNAIRES AND EXPLICIT MEASURES

In order to maintain continuity between Study 2 and this study, measures were kept as similar as possible. The questionnaires used within this study were the IMS/EMS, feeling thermometers, semantic differentials and demographic variables (in this study participants were also asked about their relationship with the person, all but three described it as 'good', the others as 'ok'). Complete details of these measures are in Chapter 5 (5.2.3.1, 5.3.1, 5.3.2, 5.3.3).

8.2.2.2 IMPLICIT ASSOCIATION TEST

There were two IAT conditions, target stimuli used within the first IAT were identical to Study 2. The second IAT condition used male stimuli specifically selected for the study. Pictures of people with skin conditions were selected from the Dermatology online website (Diepgen et al., 2003). These were elected on the criteria that the person had a visible skin condition affecting their face (female pictures were selected on the same criteria). Control pictures were volunteers recruited for their pictures to be used within this research. All of the images (16 in each category) were then trimmed to identical sizes (matching the female images) and had identical black squares placed over the eyes. These were rated by 21 people for attractiveness and severity of skin condition. These results were averaged, from this 14 photographs within one decimal place of each other for attractiveness were selected (seven in each condition) (Appendix 32). A t-test ascertained that each group of seven pictures was not significantly different to each other (Appendix 32).

Figure 8-I: Examples of Pictures Used (Skin Conditions)

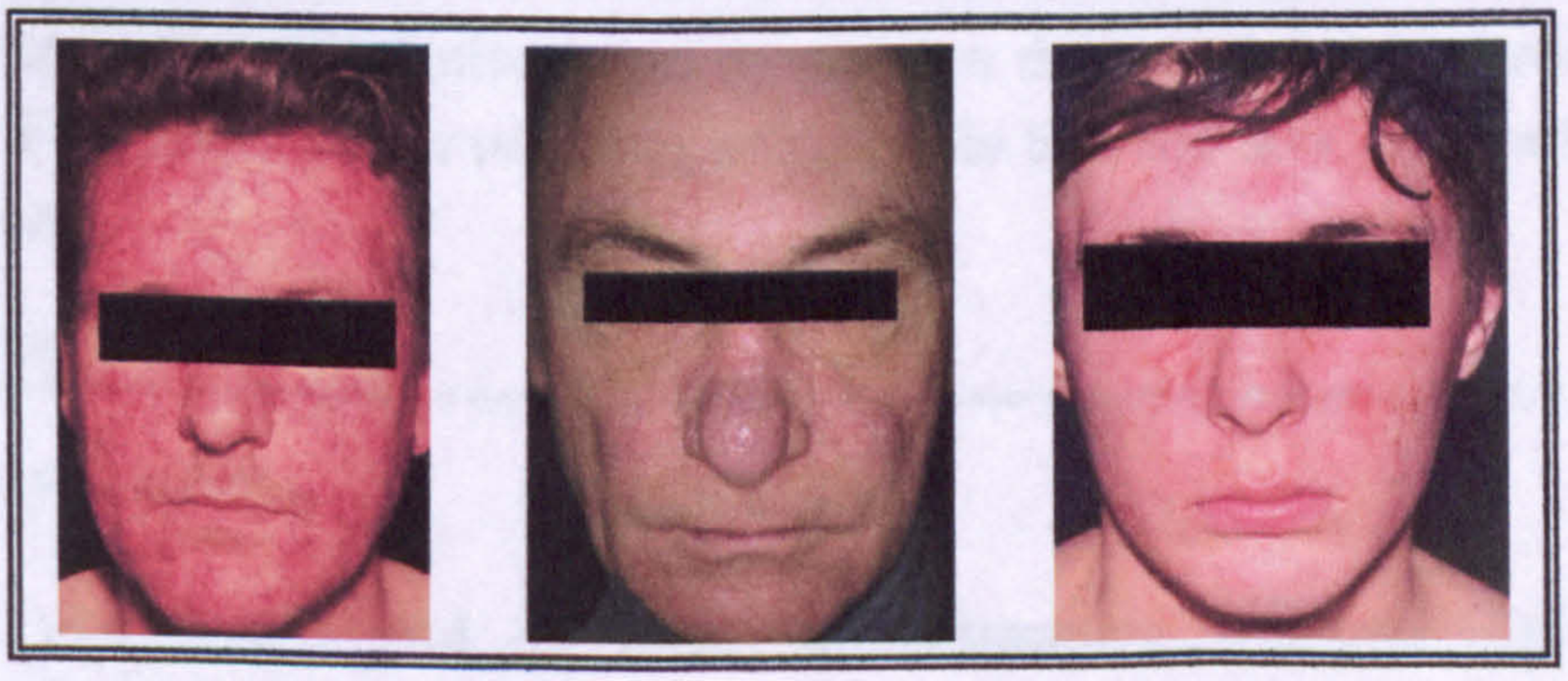


Figure 8-II: Examples of Pictures Used (Clear Skin)

All other stimuli remained identical and can be reviewed in Chapter 5 (5.4).

8.2.3 PROCEDURE

Participants were recruited to take part in a study via a poster on the psychology notice board (see Appendix 29), they were told the study 'involves a reaction time task and some short questionnaires'. They were then randomly assigned to either the male or female IAT. Table 8-I shows how the participants were distributed amongst the groups.

Table 8-I: Breakdown of Participants per Group

	Gender - Male	Gender - Female
Condition - Male	20	24
Condition - Female	20	25

Participants were not briefed that the research was looking at skin conditions. Once consent had been obtained (Appendix 3) the participant completed the IAT. Next, the participant completed the questionnaires and the demographic questions were asked. After the tasks were completed participants were given opportunity to ask any questions and received a debrief sheet (Appendix 4). They were also asked not to tell other participants that the task was looking at skin conditions.

8.3 RESULTS

8.3.1 PARTICIPANTS

Eighty-nine (49 female and 40 male) undergraduate students within the University of Sheffield volunteered to take part in the experiment in return for course credit or money. Their ages ranged from 17 to 26 ($\bar{x}$ =19.47, σ =1.75).

8.3.2 Demographic Measurements

Within this study, 42% (*n*=37) of people had personally experienced a skin condition and 58% (*n*=52) had not, these conditions were eczema (43%; *n*=16), acne (43%; *n*=16), psoriasis (5%; *n*=2) and other (8%; *n*=3; allergies, birthmarks). Of these 49% (*n*=18) were ongoing, 32% (*n*=12) had occurred in the last 5 years and 19% (*n*=7) beyond that time, the areas affected by these conditions were face and hands (76%; *n*=28) and limbs (24%; *n*=9). People knowing someone with a skin condition accounted for 57% (*n*=51) and not knowing someone with a skin condition 43% (*n*=38). Overall the skin conditions people known to them had had were eczema (47%; *n*=24), acne (35%; *n*=18), psoriasis (10%; *n*=5) and other (8%; *n*=4). These were personally experienced by friends (49%; *n*=25), siblings (21%; *n*=11), partner (16%; *n*=8), parents (8%; *n*=4), and close family (e.g., aunt, grandparent) (6%; *n*=3).

8.3.2.1 Summary of Scales; Reliability and Normality

Scales were checked for normality looking at skewness, kurtosis and Shapiro Wilk values (in the same manner as Study 1; 6.3.4.1), the thermometer and semantic differential did not meet assumptions for normality on any of the tests. Therefore, the scales were categorised into preference for skin condition, preference for clear skin and no preference, as in Study 1. The IMS/EMS scale met normality assumptions and had good reliability (Cronbach alphas: IMS; .79, EMS; .85).

8.3.3 Explicit Measures

The means for the thermometer scale ($\bar{x}$=1.16, σ=1.23) and the semantic differential ($\bar{x}$=2.33, σ=2.56) indicated an overall preference for clear skin. The ratings given on the thermometer scale resulted in scores, which showed a preference for clear skin (51%; *n*=45) no preference (38%; *n*=34) or a preference for skin conditions (11%; *n*=10). The scores from the semantic differential displayed a similar pattern of scores, 77% (*n*=69) preferred clear skin, 17% (*n*=15) displayed no preference and 6% (*n*=5) preferred people with skin conditions.

8.3.3.1 Effects of Knowledge, Personal Experience and Gender

Initially one-way ANOVAs were used to ascertain whether there was a difference in scores on the thermometer and semantic differential scales according to whether people knew somebody with a skin condition or whether they had personally experienced a skin condition. There were no statistically

significant differences in the scores on the thermometer scale [$F(1,88)=.58$, $p=.45$] or the semantic differential [$F(1,88)=.13$, $p=.72$] according to whether participants knew someone with a skin condition. Personally experiencing a skin condition did not have a statistically significant impact on either the thermometer scale [$F(1,88)=.25$, $p=.62$] nor the semantic differential [$F(1,88)=.34$, $p=.56$]. With respect to gender there was not a statistical difference between males and females for the thermometer scale [$F(1,88)=.00$, $p=.99$]. However, males indicated less preference for clear skin than females on the semantic differential ([$F(1,88)=4.64$, $p<.05$], male; $\bar{x}=1.84$, $\sigma=2.6$; female; $\bar{x}=3.03$, $\sigma=2.59$).

8.3.3.2 Correlations between Explicit Measures and Motivation

Figure 8-III shows Pearson's correlations between the explicit measures and the motivation scale. The thermometer scale and the semantic differential had statistically significant correlations with external motivation (thermometer ($r(89)=.22$, $p<.05$); semantic differential; ($r(89)=.29$, $p<.01$). There was also a statistically significant correlation between the thermometer and semantic differential scales ($r(89)=.41$, $p<.01$).

Figure 8-III: Correlations; Explicit Measures & Motivation

	External Motivation	Internal Motivation	Thermometer
Thermometer	.22*	-.02	
Semantic Differential	.29**	-.14	.41**

* $p<.05$ ** $p<.01$

8.3.4 The Implicit Association Test

8.3.4.1 Data Reduction

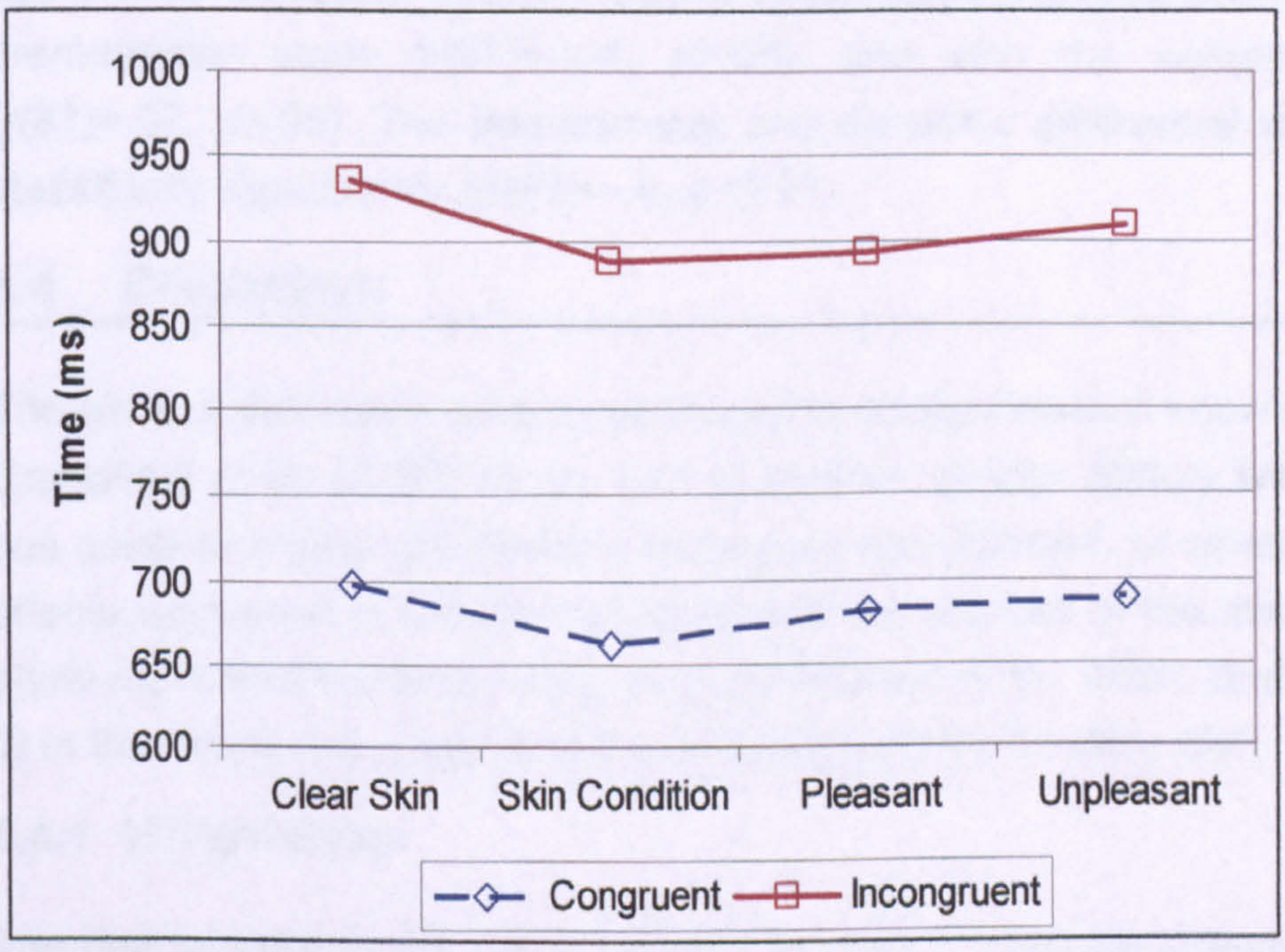
Data was reduced as described in Chapter 5 (5.4.5). Reaction times recoded to 3000ms accounted for 7% of the total, and one reaction time was recoded to 300ms. One participant got 35% of their overall responses on the IAT incorrect. In line with Greenwald et al. (1998) recommendations, this person was removed from the analysis. Of the remaining participants, no one had more than 4.5% of all the responses incorrect. For more detail regarding data quantification refer to Chapter 5 (5.4.5).

8.3.4.2 Overview of results

The congruent condition had faster reaction times than the incongruent condition across all four components of the construct (pleasant, unpleasant, clear skin, skin condition). This can be seen in Figure 8-IV In line with

Greenwald (1998) recommendations a one-tailed t-test was conducted to ascertain whether there was a significant preference for clear skin. These results were significant ($t(89)=12.99$, $p<0.001$); participants responded more positively to people with clear skin than they did to people with skin conditions.

Figure 8-IV: Reaction Times in Milliseconds for Congruent and Incongruent Responses.



8.3.4.3 Analysis of Variance

A two-way between group ANOVA was conducted to explore the type of IAT (male/female) and participant (male/female) on IAT reaction times. There were no significant effects of IAT type [$F(1,85)=.5$, $p=.48$], or of gender [$F(1,85)=.58$, $p=.45$], nor was there an interaction between the two [$F(1,85)=1.17$, $p=.28$].

As knowledge effects were most significant within the male population in the study by Grandfield et al. (2005), a two-way between groups ANOVA was conducted to look at gender and knowledge. There were no significant effects of knowledge [$F(1,85)=2.52$, $p=.12$], or of gender [$F(1,85)=.69$, $p=.41$], nor was there an interaction between the two [$F(1,85)=.39$, $p=.54$].

A two-way between group ANOVA showed a significant effect of having had a skin condition [$F(1,85)=4.01$, $p<.05$] such that participants who had personally experienced a skin condition had the least difference between their congruent and incongruent response (personal experience of skin condition $\bar{x}=182$ms, $\sigma=209$ms, no personal experience of skin conditions $\bar{x}=248$ms, $\sigma=176$ms), suggesting less implicit preference for clear skin. There was no effect of knowing someone with a skin condition [$F(1,85)=1.8$, $p=.18$], nor was there an

interaction effect [$F(1,85)=.34$, $p=.86$].

8.3.5 Correlations Between the Implicit Association Test and Explicit Measures

Correlations between the IAT, the semantic differential and the thermometer scale were explored. The IAT had a small non-significant correlation with the thermometer scale ($r(87)=-.04$, $p>.05$), and with the semantic differential ($r(87)=.02$, $p>.05$). The thermometer and semantic differential were correlated statistically significantly ($r(87)=-.4$, $p<0.01$).

8.4 Discussion

The aims of this study were to replicate the straightforward knowledge effects in Grandfield et al. (2005) study, and to explore gender effects within the IAT to see whether males and females responses are different, or whether the gender effects witnessed in previous studies were an artefact of the stimuli used. This study replicated the other three IATs (Grandfield et al., 2005, Study 1 and Study 2) in that there was a significant implicit preference for clear skin.

8.4.1 Hypotheses

The first hypothesis for this study was that the knowledge effects in Grandfield et al. (2005) would be replicated. This study failed to support the hypothesis; there were no effects within this study of knowledge on the IAT results. In addition, this study (unlike Studies 1 and 2) failed to find any interactions between knowledge, the IAT and other measures.

It is unclear why this is the case. Similar to the previous studies, the methodology employed within this study followed the guidelines set out by Greenwald et al. (1998). Additional stimuli were added to this study, but these were piloted, and screened to ensure reliability across measures, and the amount of stimuli in the study exceeded recommendations by both Greenwald et al. (1998) and a recent analysis (Nosek et al., 2005). Analysis and reduction of the data, also followed the guidelines set out by Greenwald et al. (1998). In terms of participant numbers, guidelines set out by Greenwald et al. (1998) were followed, and power analyses were conducted prior to the study to ensure adequate sample sizes, post hoc power analysis also indicated a medium effect size (see Appendix 31) and the sample was in line with or exceeded recent studies (e.g., de Jong, 2007, Hofmann et al., 2005, Huijding, 2005). Therefore, the methodology, data analysis and sample size within this study follow stringent guidelines and are satisfactory to produce reliable results.

At the end of the previous study, it was speculated that a possible reason for the lack of direct knowledge effects was that participants may have been aware of what was being measured. As details regarding this study were not given out, it seems that there are more (or different factors) affecting the relationship between knowledge and the IAT. Within all three previous studies there has been a relationship between knowledge and personally experiencing a skin condition, such that participants are more likely to know someone if they personally had a skin condition. Within this study there was a direct effect of having had a skin condition on the IAT. Participants who had personally experienced a skin condition had less difference between their congruent and incongruent responses, suggesting less implicit preference for clear skin. This suggests that this study may have picked up a component similar to the knowledge effect. However, cases of having experienced a skin condition were self report, and though most had visited a medical doctor, very few (n=2) had had a referral to a dermatologist. Therefore, future research examining this in greater depth may prefer to recruit directly from a dermatologist.

The second aim was to ascertain whether there was a difference in responses to male and female IATs and whether this differed according to the gender viewing them. Based on the study by Grandfield et al. (2005) it was hypothesised that males would respond faster to the female IAT than females, and that females would be faster when looking at the male IAT. The results were not statistically significant, there were no gender effects, either in the gender completing the IAT or in the gender of the stimuli within the IAT, nor was there an interaction between them. It is unclear why this is the case, as stated above, the methodology, analysis and participant numbers are sound. One possibility is that generally the images in the Grandfield et al. (2005) study were younger women; participants in all four of the IAT studies have been undergraduates and 'young'. It could be that using older participants in the IAT changes how participants perceive them.

Another factor that has not been looked at or controlled for in any of the studies is the gender of the person that the participant knew, it could be that this would have had an interaction with the male or female IAT.

8.4.2 Explicit Measures

Similarly to previous studies, explicit measures indicated a preference for clear skin. Unlike the previous two studies this study did not find correlations between either knowledge or suffering and the explicit measures. It is uncertain why this study produced different results. One possibility could be that different

participants were attracted to the study as they did not know what was being measured. Also there were a greater proportion of males within this study, it could be that their attitudes are affected by different components to females. In support of this, the study found that generally males indicated less preference for clear skin on the semantic differential.

This study found correlations between both of the explicit measures and external motivation. This is the same as Study 2, indicating that external motivation impacts upon explicitly reported attitudes. Future research may wish to explore how much this is an effect of social desirability and to what extent it reflects the participants attitude.

Correlations between the implicit and explicit measures were not significant, this is in line with the previous studies and published literature (e.g., Greenwald and Nosek, 2001).

8.4.3 Implications for Visible Difference

The focus of this study was restricted to examining gender effects on the IAT in more detail. This has limited immediate implications for the literature looking at visible differences. However, developing an understanding of implicit attitudes and their relationship to explicit attitudes, can help to inform interventions.

Preference for skin conditions is in line with predictions that could be made from the literature (Bull and David, 1986; Clarke, 1999; Heason and Kent, 2001; Kleck et al., 1968; Porter et al., 1990; Rumsey et al., 1982; Snyder and Endelman, 1979; Thompson et al., 2002). Within the studies there is also an ongoing theme in that motivation correlated with the explicit attitude. Future research could explore which of these factors influences the other. In addition, generally males showed less explicit preference for clear skin, exploration into further gender differences may yield relevant findings.

8.4.4 Limitations

Similarly to the previous studies within this thesis, using an undergraduate sample is likely to be a limitation, as generalisability is likely to be restricted. In this study there was particular difficulty in recruiting adequate males, this may differentiate them from females. There is also the limitation of environmental effects, viewing images is different to being in the company of other people.

This study failed to look at the gender of the person that the participant knew – this may have had an impact on the IAT results.

Whilst this study elected not to inform participants what the topic of interest was,

this also means that participants may develop an understanding at different times in the study; it is hard to ascertain when.

8.4.5 Conclusions and Future Research

To conclude, this study although controlled, did not replicate the gender effects found in earlier studies, nor did it replicate the effect of knowledge found in earlier studies. One suggestion was that this could be due to the stimuli in the study by Grandfield et al. (2005) being closer in age to the participants. Furthermore, this study found an effect of having personally experienced a skin condition which had similar qualities to that of knowing someone in Grandfield et al. (2005). Future studies could explore personal experience of skin conditions in more detail, comparing a group recruited from dermatologists with a control group.

Chapter 9: Study 4; Comparisons Between People With A Current Skin Condition and Those Without

9.1 Introduction

Research examining attitudes towards visible difference has focussed largely on observational studies and self report (Bull and David, 1986; Clarke, 1999; Heason and Kent, 2001; Kent, 2000; Rumsey et al., 1982; Thompson et al., 2002). Even within the field of disability, participants have been asked to rate disability groups, or talk about how they feel but there is little research examining behavioural and emotional responses to stimuli of the 'minority' group. Understanding the factors that underlie or account for attitudinal responses is centrally important to informing the development of both community and individual interventions. In Chapter 2 (2.4.5), existing interventions were described. These have largely been with the person who has the visible difference, and focussed on social skills training and cognitive behavioural interventions. There are a few examples of community interventions that have been undertaken to change attitudes within schools, but with limited effect (Cline et al., 1998). Much of the work of the UK charity Changing Faces involves informing and 'exposing' the general public to images of visible differences and giving talks in schools to increase awareness. The efficacy of these interventions relies to some extent on the ability of knowledge and exposure to alter underlying attitudes and automatic responses. So for example, one of the themes that has emerged from this thesis and the research by Grandfield et al. (2005) is that knowledge has an effect on the attitude. This would support Changing Faces interventions because it would seem that increased knowledge could change attitudes towards people with a visible difference.

However attitudes are present at many levels, there is the automatic (implicit or physiological) response, there is the explicit response and there is the behaviour. Within the community intervention they found that increased awareness improved children's knowledge and awareness of visible differences but there was no difference in their commitment to help others with a visible difference (Cline et al., 1998).

Knowledge effects and effects of personally experiencing a skin condition have differed throughout the studies, in the study by Grandfield et al. (2005) they found a direct knowledge effect on the implicit attitude but this was not present within the explicit attitude. Study 1 (Chapter 6) within this thesis found an

interaction between knowledge and personally experiencing a skin condition on the IAT, and an interaction between self-esteem and knowledge, but there were no effects on the explicit measures. Study 2 (Chapter 7) looked at the effects of the personalised IAT and found no effects of knowledge or personally experiencing a skin condition on the IAT. Within the male study (Study 3; Chapter 8) there was a direct effect on the IAT of having had a skin condition. There has not been any consistency between the studies and a number of suggestions have been made. One of which is that the discrepancies may be due to the large overlap between people who have personally experienced a skin condition and those that know someone with a skin condition, it can also be hard to determine the severity of the skin condition.

Relatively few studies have looked at the responses of people with a visible difference towards others, and at present there is no published literature comparing these responses to those who are not visibly different. Within the disability literature, one study (Mastro et al., 1996) looked at the attitudes of people with a disability towards other disability groups. They found a preference for own disability but did not compare these responses to someone who did not have a disability. Ascertaining the differences in attitudes may enable a distinction to be made between people with exposure to skin conditions and those without.

This study may also allow a greater understanding to be gained regarding the attitudes of clinical populations. For example, if the response is an evolutionary disgust response, this could have considerable impact on people a visible difference, as they may have the same response to themselves. This could account for some of the psychological distress they experience. It could be that participants with high disgust and shame proneness are the ones who cope worst with their visible difference. This was indicated in Study 1 by the high correlations between disgust, appearance and shame on the questionnaire measures.

In addition to exploring reactions and attitudes, this study also has an additional important role. A number of reviews have described how adjustment in visible difference is not a product of severity or other biomedical factors, but highly likely to be moderated by psychosocial factors (Thompson and Kent, 2001; Rumsey and Harcourt, 2004). Earlier in Study 1, the role played by disgust, appearance concern and shame was explored and found to be highly co-dependant and to relate to explicit preference for clear skin. Consequently, it seems imperative to explore the role played by these factors in relationship to

attitudes and those affected. Whilst knowledge or experience of the condition may reduce the innate negative attitude, such psychological factors are more likely to be implicated. If this is the case, then these factors would need to be targeted in interventions.

This study recruited participants from within two NHS dermatology departments, in order to examine the responses of a clinical population to skin conditions and to look at the differences between them and a control group.

9.1.1 Aims

The main aims of this study were; to explore implicit, explicit and psychophysiological responses and see how these varied according to whether participants were from the clinical or control groups; and to investigate how these varied according to pre-identified psychological factors thought likely to be implemented in adjustment to living with a visible difference.

9.1.2 Hypotheses

9.1.2.1 Explicit Attitudes

In Study 1, 2 and 3, participants who knew someone showed least explicit preference for clear skin on the explicit. Study 2 also found that participants who had personally experienced a skin condition had less explicit preference for clear skin. As the groups within this study are more defined; a control group compared to a clinical sample, differences within explicit attitudes may be more pronounced. Deal (2003) found that people with a disability rated their own group more favourably, thus within the current study it is anticipated that participants with skin conditions will have more positive reactions (or no difference) towards those with skin conditions than participants in the control group.

In Study 1 there was an impact on the thermometer scale of shame, such that those with higher ratings were more likely to state a preference for clear skin on the explicit measures. It is thought that this effect will also be apparent within this study. In addition, as there are two distinct groups it is anticipated that there will be effects of disgust and appearance schema. Therefore, the hypotheses are:

- ✧ The control group will show greater negativity on the explicit measures towards skin conditions, than those affected by skin conditions.
- ✧ Individuals scoring highly on disgust, appearance schema and shame will

show greater preference for clear skin on the measures of explicit attitude in both groups.

9.1.2.2 Implicit Association Test

Based on the previous studies it is hypothesised that generally participants within this study will show a preference for people with clear skin on the implicit association test. As Grandfield et al. (2005) found a knowledge effect, Studies 1 and 2 found an interaction with knowledge and Study 3 found an effect of personal experience of a skin condition. It is hypothesised that within this study where there are two distinct samples of participants that there will be an overall effect of personal experience of a skin condition. Participants with a skin condition will have a significant difference in their reaction times on the IAT to control participants.

- ✧ Participants will show a preference for clear skin on the IAT.
- ✧ The clinical group will have less implicit preference than the control group.
- ✧ High disgust, shame, and appearance ratings will produce greater preference for clear skin in both groups.

9.1.2.3 Psychophysiology

Within this study it is expected that heart rate will show a similar pattern to Study 1, such that heart rate differentiates between the stimuli groups and also that skin conditions and clear skin produce less physiological activation than the IAPS. However, as skin conditions are more salient to the participants that experience them, it was thought that they would either show greater arousal and attention; indicating greater emotional involvement; or less arousal and attention because they are familiar with the stimuli and have habituated.

The psychophysiological equipment was improved (see 9.2, below) after Study 1. It was anticipated that this would produce clearer responses within the EMG measures. It is hypothesised therefore that this study will produce effects when viewing skin conditions and clear skin, such that there will be increased corrugator supercilii activation when viewing the images of skin conditions (as hypothesised but not found in Study 1). It was also predicted that there may be increased levator labii activation when viewing the skin conditions. Within the EMG measures it was thought that the clinical participants would show less negativity than the control group, because they had had exposure to skin conditions.

- ✧ There will be a difference between those currently experiencing a skin condition and the control group in the degree of arousal and attention paid to images of skin conditions.
- ✧ The EMG will show greater activation of the corrugator supercilii when viewing skin conditions
- ✧ The levator labii muscle will be activated when viewing skin conditions indicating a disgust response.
- ✧ It is expected that there will be an interaction with disgust, shame and appearance and the psychophysiological measures. Such that higher scores on the scales indicate higher attention and arousal, and lower valence when viewing skin conditions.

9.1.2.4 Clinical and Control Groups

Between the clinical and control group it was hypothesised that the clinical population would have; higher levels of anxiety, depression, shame and appearance concern, based on the literature discussed in Chapter 2 (i.e., Gupta et al., 1993, Marks et al., 1999; Kellett and Gawkrodger, 1999; Kent and Thompson, 2003; Lannigan and Cotterill, 1989; Neil, 2001; Papadopoulos et al., 1999; Thompson and Kent, 2001).

9.2 Method

9.2.1 Design

The design of this study is a between group (clinical and control) convenience sample. Clinical participants were recruited from two NHS dermatology departments in South Yorkshire and control participants were recruited via a volunteer list held by Sheffield University (more details on samples below; 9.2.3.1).

9.2.2 Measures

9.2.2.1 Counterbalancing

The counterbalancing within this study was simplified following Study 1. The IAT and Psychophysiology will not be counterbalanced. In Study 1 there were no order effects found, so reducing the counterbalancing also reduced the total amount of participants needed within the experiment. Also, the IAT appears to

be sensitive to small manipulations, so reducing the amount of differences between IAT conditions may yield a more robust picture. The disadvantage of this methodology is that order effects cannot be accounted for, and difficulty replicating individual task results within the study could be attributable to the order they were completed in.

Counterbalancing within individual tasks remains the same unless detailed within the relevant section below, and can be reviewed in Chapter 5 (5.4.4, 5.5.2.1, 5.6).

9.2.2.2 Individual Difference and Explicit Measures

The scales used in this study were the internal and external motivation scale (IMS/EMS), Davey disgust scale, appearance schema inventory (ASI-r), other as shamer scale (OAS), skin shame scale (SSS), hospital anxiety and depression scale (HADS) and the dermatology life quality index (DLQI) (full details of these scales are in Chapter 5; 5.2). The explicit measures were the thermometer and semantic differential. Demographic questions were also included. The scales were similar to Study 1 so that comparisons could be made between the studies.

In Study 1 the disgust scales were combined to make analysis simpler. In order to reduce the burden on participants, only the Davey disgust scale was included in the present study. It was decided that this scale would be selected over the Haidt because the scale looks at disgust sensitivity and trait rather than describing situations that the participant may find disgusting. It was felt that the Haidt scale was too global, and that measuring disgust to blood, or animals may not have the same focus as general disgust. This study is interested in how disgust in general (rather than domain specific) may impact attitudes to skin conditions. Another advantage of the Davey scale is that there are two subscales, so if reliability of the scale as a whole is not high then one or both of the subscales can be used within the analysis. An additional problem with the Haidt scale was that participants asked how to answer certain questions within it rather than completing it autonomously, this raises the question of how much impact the experimenter had on the results.

An additional scale was added, the DLQI, in order to look at the impact of a participant's skin condition on their life. This was included because much of the literature has found that severity of the visible difference, and impact on everyday life, affects coping and self-esteem (Thompson and Kent, 2001). It was felt that life quality could be looked at in relation to the other individual

differences and in relation to the attitudinal and emotional measures. The HADS was also included so that anxiety and depression levels within the clinical sample could be measured and compared to the control group, and to previous literature.

Since Study 1, a scale specific to skin shame has been developed (Scott, 2004), the scale appeared to have high reliability and validity. Use of the scale in this study had two advantages, one was that it was specifically designed for the clinical sample investigated and the second was that additional validity could be established for the scale. As this resulted in a total of three shame scales, the internal shame scale was eliminated from this study. This was because the OAS had been used to help establish reliability of the SSS.

9.2.2.3 Implicit Association Test

This remained the same as described in Chapter 5 (5.4).

9.2.2.4 Psychophysiology Measures

The measures for the psychophysiology remain the same (Chapter 5; 5.5) but an alteration to the set-up was employed. In the original set-up the electrodes from the participant were plugged into a box, which then passed the signal through cables to the data collection room, where the signal was amplified before passing to the computer. In the new set-up the amplifier was moved to the testing room and the electrodes were plugged directly into it, then a cable ran through to the computer in the data collection room. As the amplification occurred close to the participant it ensured minimal noise was amplified.

9.2.2.5 Self Assessment Mannequin Measures

These remained the same (Chapter 5; 5.6) except the counterbalancing was simplified such that arousing and pleasant always remained on the left, this was because the previous system took a long time for participants to complete, as they could not automate the procedure (in Appendix 23, the first and third SAMs were used).

9.2.3 Procedure

9.2.3.1 Recruitment

9.2.3.1.1 Clinical Sample

The participants in the clinical sample were recruited from two NHS dermatology departments, Sheffield and Barnsley. The inclusion criteria for the

participants was that they were over 18 years old, had a chronic (ongoing) skin condition affecting their face, spoke fluent English and were mobile enough to access the psychology department. There was one exclusion criterion; participants with a known sensitivity to propylparaben, methylparaben, and sodium polyacrylate (ingredients in the electrolytes and abrasive gel) were not put forward, to ensure that the study did not exacerbate participants skin conditions. After seven months of recruitment, only nine participants had been recruited so the inclusion criteria were amended such that conditions affecting any area of the body (except the genital region, exclusively) could be included, It was decided that a sample size that met power requirements (see Chapter 5; 5.7 to review) but with various areas of the body affected was better than a very small sample with just the face affected. All participants were given £10 toward their travel expenses (nine participants declined the payment).

Recruitment in Barnsley commenced about eight months prior to Sheffield (due to administrative delays) and was typically as follows. Doctors (or nurses) would identify patients that met the inclusion criteria; then the nurse would ask them if they were interested in taking part in the study. Patients who expressed an interest were spoken to about the study by the experimenter, who explained the purpose of the study and what would be involved. Potential participants were given an information sheet (Appendix 2) and a map to find the psychology department. If possible an appointment was made with them immediately, alternatively they were called at a convenient time. As recruitment continued the nurses took names of people who may be interested and passed them to the experimenter to call during the week.

Recruitment in Sheffield was slightly different, the experimenter remained with the doctor whilst he saw clients and he asked them (with the experimenter present) to take part. Participants who agreed then spoke to the experimenter after they had finished talking to the doctor. The purpose of the study was then explained, information sheets and a map given and an appointment was made immediately if possible.

9.2.3.1.2 Control Sample

Participants in the control group were recruited via a volunteer list run by the university. An e-mail went to every member of staff within the university detailing the study, many of the recipients' volunteered partners, children, relatives, parents and friends, ensuring a mixed sample of people. Initially an e-mail (Appendix 33) was sent asking participants to contact me for further details if they were interested. Approximately 130 people responded to the email, so a

second e-mail (Appendix 34) with a copy of the information sheet was sent. Replies to the second e-mail were entered into a spreadsheet and matched to the age and gender of existing participants.

9.2.3.2 Typical Procedure

Participants were asked if they had read the information sheet and asked if they had any questions (those that had not read the sheet or could not remember what it said were given a copy to read). Participants were then asked to sign a consent form (Appendix 3). Next the participant filled in the HADS and ASI-R scales, and then completed the IAT. Next the disgust, IMS/EMS, ISS, SSS and DLQI scales were completed. Following this was the psychophysiology task followed by the SAM. Finally participants completed the explicit measures and were questioned about demographic variables. All participants were given the opportunity to ask questions and given a debrief sheet.

9.3 Results

9.3.1 Participants

In total there were 78 participants, 39 of which were recruited from dermatology departments and 39 matched controls. Ages ranges from 18–82 ($\bar{x}$=43.12, σ=15.65). A breakdown of the participants according to group and gender can be seen in Table 9-I.

Table 9-I: Age and Gender of Recruited Groups

	Male	Female	Age $\bar{x}(\sigma)$
Clinical	15	24	43 (18.2)
Control	15	24	43.2 (13)

9.3.2 Demographic Variables

In the clinical group, the skin conditions participants stated they experienced were; acne (21%; *n*=8), psoriasis (26%; *n*=10), eczema (41%; *n*=16) and other (13%; *n*=5, included conditions; vitiligo, rosacea, morphea, undiagnosed). The areas affected were whole body (33%; *n*=13), visible areas (54%; *n*=21), torso (10%; *n*=4) and limbs (3%; *n*=1). The duration of the condition ranged from several months to 66 years, 43% (*n*=17) had had their skin condition for less than ten years, 18% (*n*=7) for 10 to 20 years and the remaining 39% (*n*=15) were between 20 and 66 years. In the clinical group 69% (*n*=27) knew someone with a skin condition; these were partner (11%; *n*=3), close family (63%; *n*=17), extended family (15%; *n*=4) and friend (11%; *n*=3).

There were few differences between the Barnsley and Sheffield samples, they both had a similar distribution of gender. Sheffield had more people experiencing eczema than any other condition, whereas Barnsley had a greater variety of conditions.

In the control group 49% (*n*=19) had personally experienced a skin condition in the past, of these 31% (*n*=6) had had acne, 36% (*n*=7) eczema and 31% (*n*=6) other (included red face, spots, warts and fungal). Areas affected were all over (5%; *n*=1), visible areas (68%; *n*=13), torso (16%; *n*=3) and limbs (5%; *n*=1) and one not reported. No one in the control group currently had a skin condition. Some participants had had a skin condition in the past (*n*=18), of these the most recent was 4 years ago ($\bar{x}$=19.61, σ 12.46). In the control group 62% (*n*=24) knew someone with a skin condition; these were partner (12.5%; *n*=3), close family (50%; *n*=12), extended family (12.5%; *n*=3) and friend (25%; *n*=6).

9.3.3 Data Quantification

Data was quantified as described in Chapter 5 (5.2, 5.3, 5.4.5, 5.5.3, 5.6.2.1).

9.3.4 Questionnaire Measures

The reliability of the scales was ascertained using Cronbach alphas, all of the scales were reliable, the lowest alpha was depression (r=.69). Skewness, kurtosis and Shapiro Wilk scores were looked at with respect to the scales, similar to Study 1. The thermometer and semantic differential did not meet normality assumptions, as such they were split into three categories for the remaining analysis, prefer clear skin, no preference, prefer skin condition. Disgust sensitivity did not meet normality within this study, so both subcomponents (trait and sensitivity) of the scale were combined. The combined scale met normality assumptions; the Cronbach alpha for the combined scale was .89, an increase on both scales individually. Further analysis within this chapter looks at the scale as a whole.

Table 9-II: Means and Alphas for the Scales

Scale	Clinical $\bar{x}$	(σ)	Control $\bar{x}$	(σ)	Alpha's
Anxiety	7.84	(4.51)	6.41	(2.83)	.83
Depression	4.68	(2.86)	2.9	(1.9)	.69
ASI-r Self-Evaluation	32.36	(9.19)	36.31	(9.63)	.9
ASI-r Motivation	21.74	(3.65)	22.49	(2.98)	.85
IMS	12.84	(3.12)	13.84	(3.19)	.77
EMS	13.26	(5.28)	14.33	(4.18)	.79
Thermometer Scale	-.03	(1.78)	.46	(1.67)	-
Semantic Differential	.33	(5.1)	2.18	(3.24)	-
Trait	33.11	(7.34)	33.84	(5.79)	.84

Sensitivity	37.42	(9.48)	37.13	(7.96)	.78
OAS	19.82	(12.41)	21.2	(9.48)	.94
IAT	.11	(.08)	.11	(.1)	-
Skin Shame	68.47	(17)	-	-	.93
DLQI	34.72	(5.46)	-	-	.85

9.3.4.1 Gender and Group Effects

Two way between group ANOVAs were conducted to look at effects of gender and clinical or control group on the scales. There was a large significant effect of depression between the clinical and control groups [$F(1,76)=7.97$, $p<.01$]; $\eta^2=.09$). Appearance self-evaluation had an effect of gender [$F(1,77)=10.93$, $p<.01$) such that males had higher scores ($\bar{x}=38.67$, $\sigma=7.62$) than females ($\bar{x}=31.96$, $\sigma=9.29$; $\eta^2=.12$), the interaction between gender and group was almost significant [$F(1,77)=3.93$, $p=.051$; $\eta^2=.05$), such that females in the clinical group reported much lower levels of appearance self-evaluation ($\bar{x}=28.42$, $\sigma=7.93$) than those within the control group ($\bar{x}=35.5$, $\sigma=9.34$). Males remained very similar across groups (clinical; $\bar{x}=38.67$, $\sigma=7.53$, control; $\bar{x}=38.07$, $\sigma=7.96$). Males had significantly lower external shame than females [$F(1,77)=9.23$, $p<.01$; males; $\bar{x}=15.93$, $\sigma=10.58$; females; $\bar{x}=23.4$, $\sigma=10.44$), $\eta^2=.11$].

9.3.4.2 Dermatology Life Quality Index

In order to assess effects of life quality, the clinical group were median split according to their responses on the DLQI. This was such that one group had high scores on the DLQI and the second group had low scores, indicating more impact of their skin condition on their everyday life. These two groups and the control group were then compared using a one way ANOVA. There were significant differences in anxiety [$F(2,76)=4.64$, $p<.05$], depression [$F(2,76)=8.01$, $p<.01$], appearance motivation [$F(2,76)=6.55$, $p<.01$], appearance self-evaluation [$F(2,76)=7.18$, $p<.01$], and disgust [$F(2,75)=8.56$, $p<.01$]. Post hoc tests were completed to see where the differences lay. Within the clinical group there was a significant difference in their scores on the skin shame scale [$F(1,38)=35.18$, $p<.001$]. Full details of these results are in Table 9-III. There is a significant difference between participants within the clinical group with high and low levels of DLQI, in depression, anxiety, appearance and disgust. Depression, anxiety and disgust were higher, whereas appearance concern was lower in the clinical group with low quality of life. Participants with low DLQI had higher levels of skin shame, showing the potential value of this short scale, which has yet to be published.

Table 9-III: Group Comparisons Using DLQI

Individual Difference	Group	$\bar{x}$ (σ)	Significantly Different to:
Anxiety	Control	6.41(2.9)	Low DLQI**
	Low DLQI	10.18(3.79)	Control**
			High DLQI**
	High DLQI	6.89(4.49)	Low DLQI*
Depression	Control	2.9(2.01)	Low DLQI**
	Low DLQI	6.09(2.63)	Control**
	High DLQI	4.11(2.79)	ns
Appearance Self-Evaluation	Control	36.49(8.82)	Low DLQI**
	Low DLQI	25.55(8.73)	Control**
			High DLQI**
	High DLQI	34.05(8.02)	Low DLQI**
Appearance Motivation	Control	22.44(2.92)	Low DLQI**
	Low DLQI	19(4.22)	Control**
			High DLQI**
	High DLQI	22.82(2.8)	Low DLQI**
Disgust	Control	70.8(12.23)	Low DLQI**
	Low DLQI	83.9(16.25)	Control**
			High DLQI**
	High DLQI	65.07(11.85)	Low DLQI**
Skin Shame	Low DLQI	86.91(11.13)	High DLQI**
	High DLQI	60.96(12.63)	Low DLQI**

* $p<.05$ ** $p<.01$

9.3.4.3 Correlations Between Scales

Figure 9-I shows the correlations between the various scales for all participants. Similarly to Study 1 there were significant correlations between appearance and disgust. However within this study external shame did not correlate with any of the other measures, also the direction of some of the correlations is different. Within this matrix participants with high appearance motivation and self-evaluation had low skin shame and disgust scores; this is the reverse of those in study 1. Disgust had a positive correlation with skin shame suggesting the relationship between 'self disgust' and shame.

Figure 9-I: Correlation Matrix of Scales and All Participants

Appearance Motivation	.61**			
External shame	-.2	-.02		
Skin shame	-.59**	-.45**	.22	
Disgust	-.49**	-.34**	.13	.53**
	Appearance Self-Evaluation	**Appearance Motivation**	**External Shame**	**Skin Shame**

* $p<.05$ ** $p<.01$

9.3.5 EXPLICIT MEASURES AND INDIVIDUAL DIFFERENCES

The means for the thermometer ($\bar{x}$=.19, σ=1.72) and semantic differential ($\bar{x}$=1.21, σ=4.34) indicated a preference for clear skin. Overall, the ratings given on the thermometer scale were no preference (55%; *n*=43), a preference for clear skin (24%; *n*=19) or a preference for skin conditions (21%; *n*=17). The semantic differential had a similar pattern; 52% (*n*=41) preferred clear skin, 40% (*n*=31) displayed no preference and 18% (*n*=14) preferred skin conditions. There are more people indicating a preference for skin conditions in this study than in Study 1. Splitting the results by group indicates that this effect is most prominent within the clinical group, 28% (*n*=11) preferred skin conditions, whereas only 8% (*n*=3) of the control group did on the semantic differential. On the thermometer scale 26% (*n*=10) of the clinical opposed to 15% (*n*=6) of the control participants displayed a preference for skin conditions.

9.3.5.1 EFFECTS OF GROUP, KNOWLEDGE AND GENDER

Initially one-way ANOVAs were used to ascertain whether there was a difference in scores on the thermometer and semantic differential scales according to whether participants were in the clinical or control group or whether they knew somebody with a skin condition. There were no statistically significant differences in the scores on the thermometer scale [$F(1,76)=1.26$, $p=.27$] according to group. The semantic differential was approaching statistical significance [$F(1,76)=3.24$, $p=.08$] with the control group showing most preference for clear skin (control; $\bar{x}$=2.08, σ=3.26; clinical; $\bar{x}$=.33, σ=5.1). Knowing someone with a skin condition did not have a statistically significant impact on either the thermometer scale [$F(1,76)=.13$, $p=.72$] nor the semantic differential [$F(1,76)=.09$, $p=.76$]. With respect to gender there were no statistical differences between males and females for the semantic differential [$F(1,76)=1.13$, $p=.29$]. However, males indicated greater preference for clear skin than females on the thermometer ([$F(1,76)=5.76$, $p<.05$], male; $\bar{x}$=.77, σ=1.63; female; $\bar{x}$=-.17, σ=1.69).

9.3.5.2 CORRELATIONS BETWEEN EXPLICIT MEASURES AND INDIVIDUAL DIFFERENCES

Figure 8-III shows Pearson's correlations between the explicit measures and the individual differences. The thermometer had a positive correlation with internal motivation ($r(75)=.24$, $p<.05$) and with the semantic differential ($r(78)=.54$, $p<.01$).

Figure 9-II: Correlations; Explicit Measures & Individual Differences

	Anxiety	Depression	Appearance Self-Esteem	Appearance Motivation	Internal Motivation	External Motivation	External Shame	Disgust	Semantic Differential
Semantic Differential	.12	-.02	-.02	-.04	.14	-.09	-.12	-.01	
Thermometer	.04	-.11	-.08	.01	.24*	.01	-.06	.12	.54**

* $p<.05$ ** $p<.01$

Figure 9-III shows correlations between the explicit measures and those relevant only to the clinical group. These were not statistically significant.

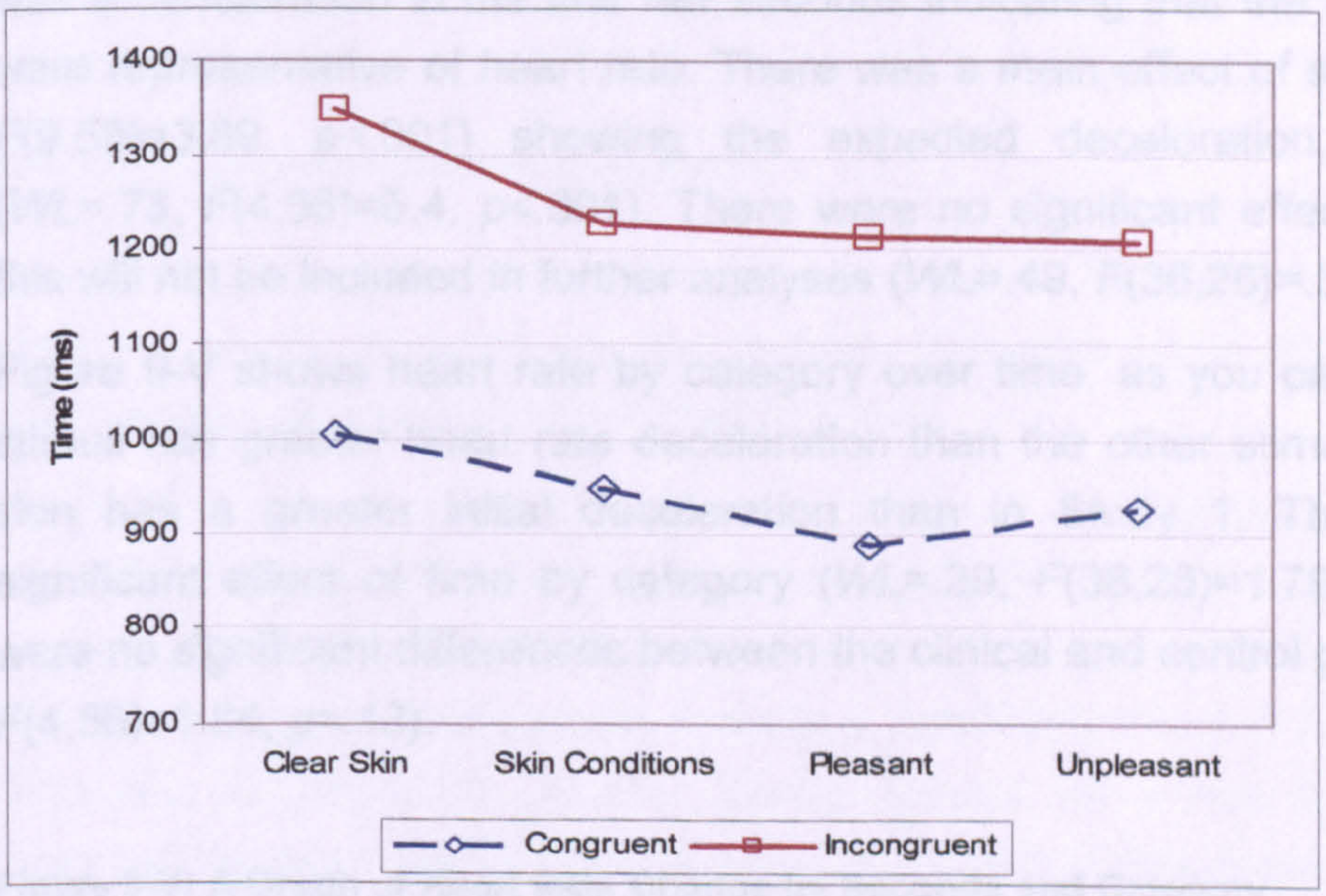
Figure 9-III: Correlations; DLQI, Shame & Explicit Measures

	Skin Shame	DLQI
Thermometer	.1	-.01
Semantic Differential	.07	.31

9.4 Implicit Association Test

Data was missing for two participants from the clinical group for this task, as they did not have time to do all of the tasks. Initially basic differences in congruent and incongruent conditions were assessed. Inline with previous research, a one-tailed t-test indicated that these results were significant ($t(73)=10.55$, $p<.001$) and indicates that people responded more positively to participants with clear skin than they did to people with skin conditions. From Figure 9-IV it is evident that the congruent condition had faster reaction times across all four components of the construct (pleasant, unpleasant, clear skin, skin condition).

Figure 9-IV: Mean IAT Scores for Congruent and Incongruent Conditions



9.4.1.1 Further Tests

Two way between group ANOVAs were conducted to see if there were effects of group (clinical or control) and gender, then knowledge on the IAT. There were no main effects of group [$F(1,72)=.4$, $p=.53$] nor an interaction between them (group and gender [$F(1,72)=.05$, $p=.83$], group and knowledge [$F(1,72)=.001$, $p=.97$] . Analyses were conducted with just the clinical group to ascertain whether there was an effect of recruitment department, there was not [$F(1,35)=.92$, $p=.34$).

9.4.1.2 Correlations between the Implicit Association Test and Explicit Measures

The correlations between the IAT, the thermometer scale and the semantic differential were not statistically significant (both; $r(76)=-.03$, $p>.05$).

9.4.2 Psychophysiology

Due to equipment failure ($n=14$; unsuccessful recording, computer acquisition problems and high noise) there is only data for 64 participants (33 of them were from the control group and 31 from the clinical group).

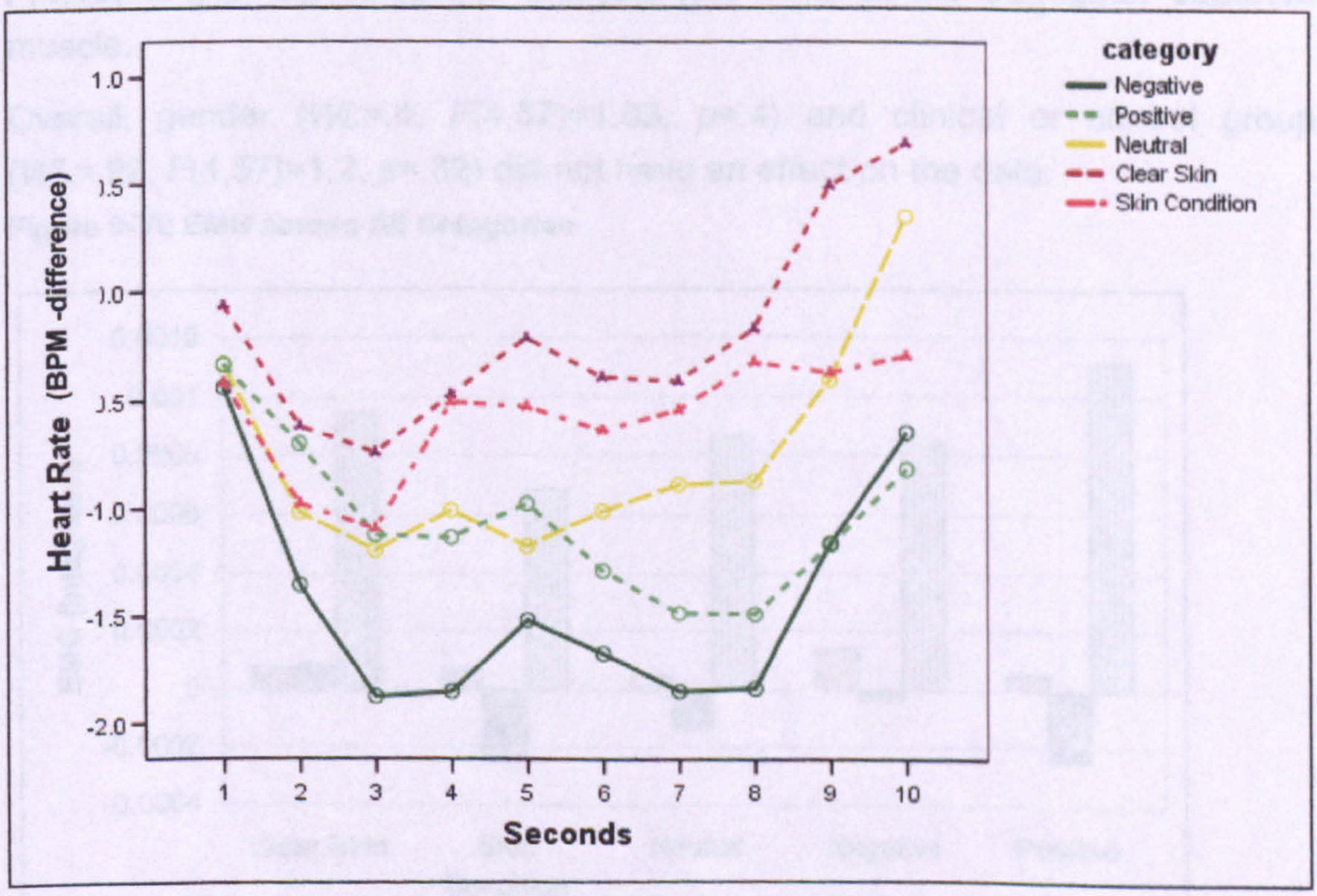
9.4.2.1 Heart Rate

The data were analysed by two within (seconds x category), two between (order x independent variable) ANOVAs. Initially the data were examined to ensure it

was representative of heart rate and to see whether there were differences between the stimuli groups. Heart rate changed over the time period and there was a deceleration in the first few seconds indicating that the measures taken were representative of heart rate. There was a main effect of seconds (*WL*=.6, *F*(9,53)=3.89, *p*<.001) showing the expected deceleration, and category (*WL*=.73, *F*(4,58)=5.4, *p*<.001). There were no significant effects of order and this will not be included in further analyses (*WL*=.49, *F*(36,26)=.58, *p*=.56).

Figure 9-V shows heart rate by category over time, as you can see the IAPS stimuli has greater heart rate deceleration than the other stimuli, though clear skin has a greater initial deceleration than in Study 1. There was not a significant effect of time by category (*WL*=.29, *F*(36,26)=1.79, =*p*.06). There were no significant differences between the clinical and control groups (*WL*=.88, *F*(4,56)=1.84, *p*=.13).

Figure 9-V: A Graph of Heart Rate Change by Seconds and Category



9.4.2.1.1 Effects of the Individual Difference Variables

There were no significant effects of any of the individual differences (external shame (*WL*=.35, *F*(36,25)=1.28, *p*=.26), anxiety (*WL*=.4, *F*(36,23)=.96, *p*=.55), depression (*WL*=.42, *F*(36,23)=.88, *p*=.65), appearance motivation (*WL*=.27, *F*(36,24)=1.8, *p*=.07), appearance self evaluation (*WL*=.41, *F*(36,24)=.94,

p=.57), internal motivation (*WL*=.4, *F*(36,21)=.87, *p*=.65), external motivation (*WL*=.44, *F*(36,24)=.85, *p*=.68), disgust (*WL*=.37, *F*(36,22)=1.04, *p*=.47). RPA analysis was also conducted, there were no significant effects of category by either time point (time 1; [*F*(1,59)=.96, *p*=.44], time 2 [*F*(1,57)=1.24, *p*=.29]).

9.4.2.2 Electromyography Activity

The EMG data were quantified as described in Chapter 5 (5.5.3.2.1). The following results reported are the findings from two within (EMG x category), one between (independent variable) ANOVAs.

Figure 9-IV shows all five categories; there is a significant effect of EMG (*WL*=.79, *F*(2,46)=6.25, *p*<.01) but not category (*WL*=.92, *F*(4,44)=.93, *p*=.46) or category by EMG (*WL*=.79, *F*(8,40)=1.36, *p*=.25). However when looking at just the corrugator supercilii muscle there is a significant effect of EMG by category (*WL*=.83, *F*(4,58)=3.08, *p*<.05). These effects were not apparent for the zygomaticus major (*WL*=.98, *F*(4,53)=.29, *p*=.89) or the levator labii (*WL*=.94, *F*(4,49)=.94, *p*=.5), so further analysis just looks at the corrugator supercilii muscle.

Overall, gender (*WL*=.4, *F*(4,57)=1.03, *p*=.4) and clinical or control group (*WL*=.92, *F*(4,57)=1.2, *p*=.32) did not have an effect on the data.

Figure 9-VI: EMG across All Categories

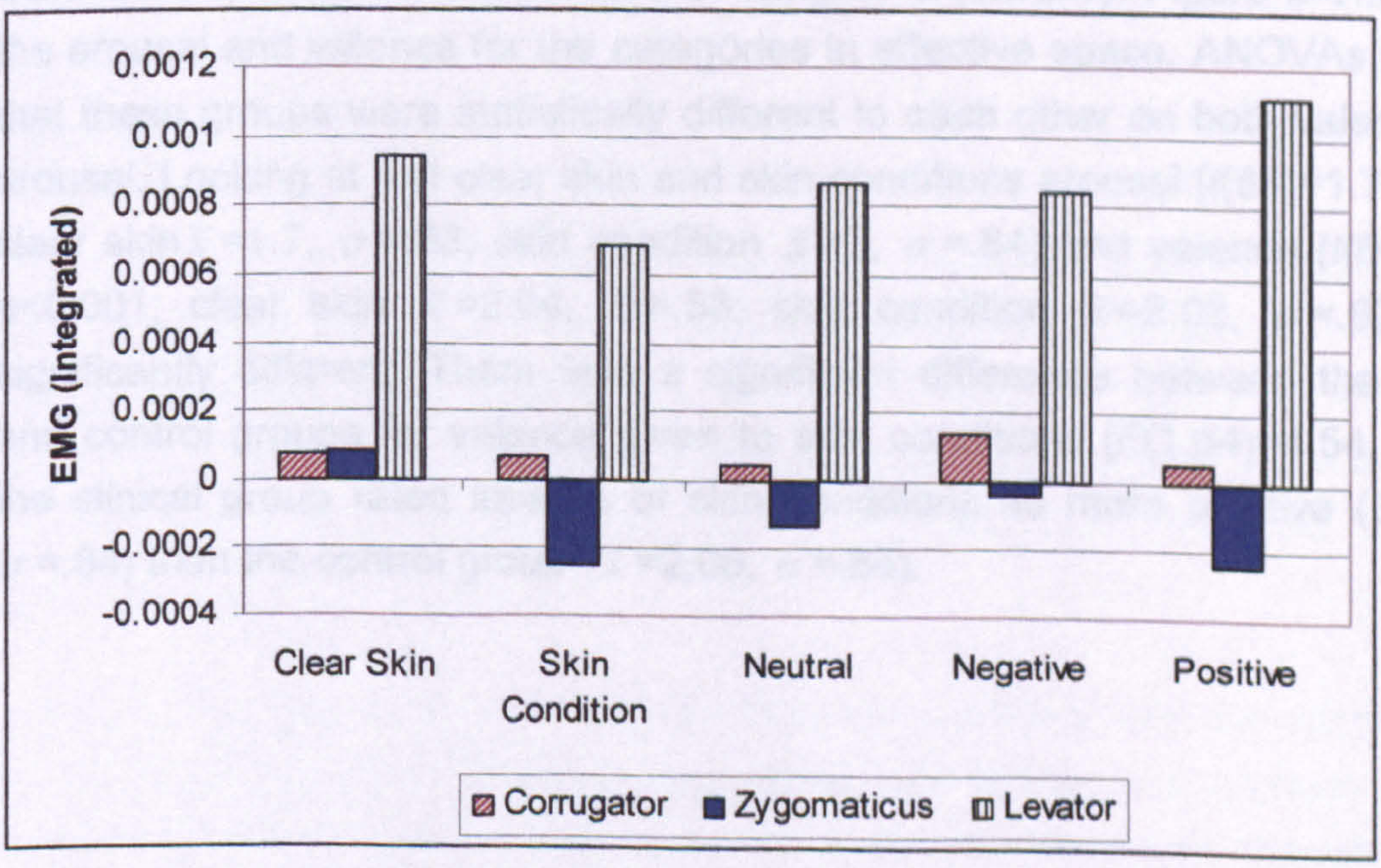
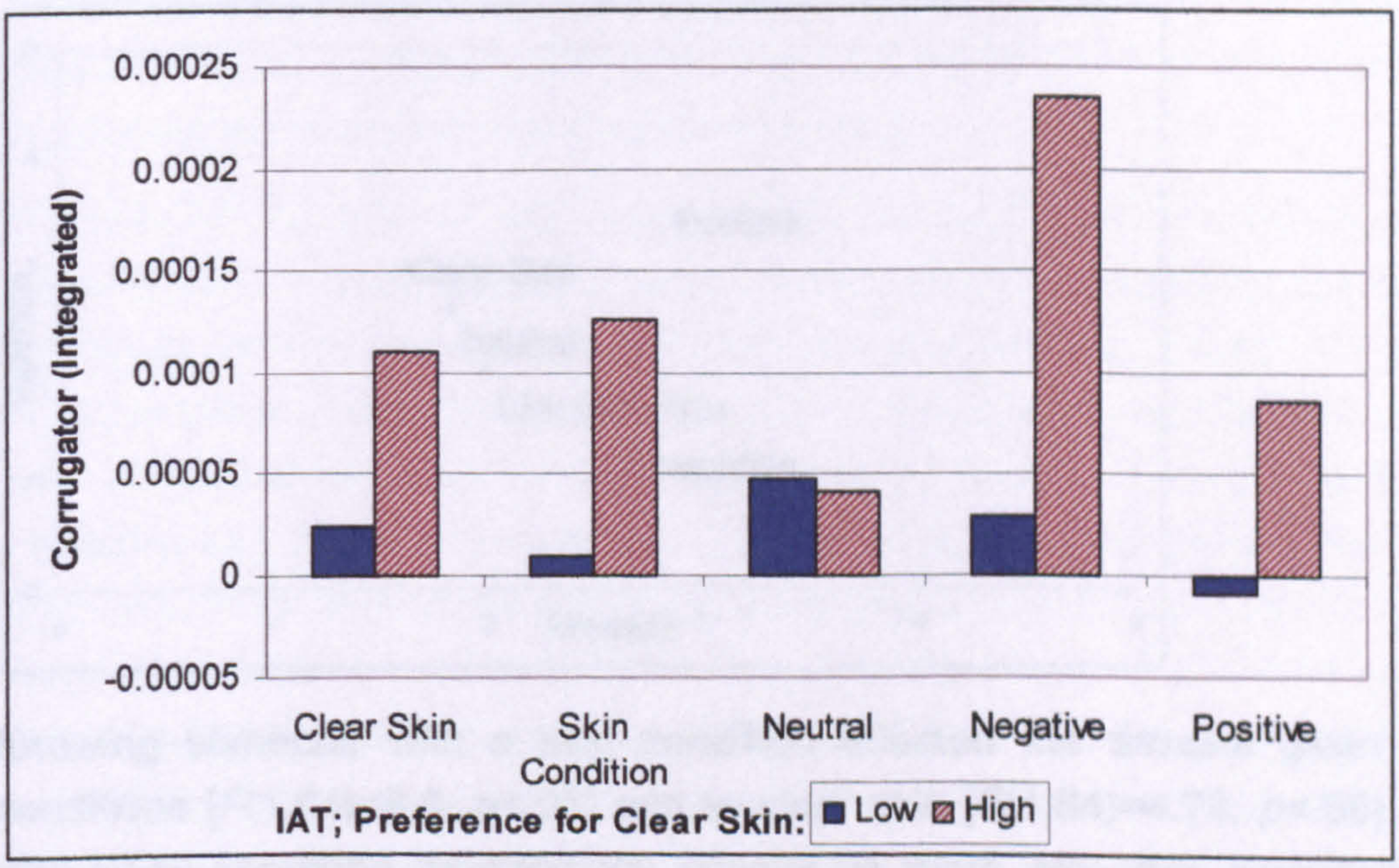


Figure 9-VII shows that people who had high preference for clear skin on the IAT had higher corrugator supercilii activation during all of the stimuli except when viewing neutral images. The difference in high and low IAT preference

across all of the stimuli groups was significant ($F(4,56)=2.82$, $p<.05$).

Figure 9-VII: Effects of Low and High IAT Preference across 5 Categories.

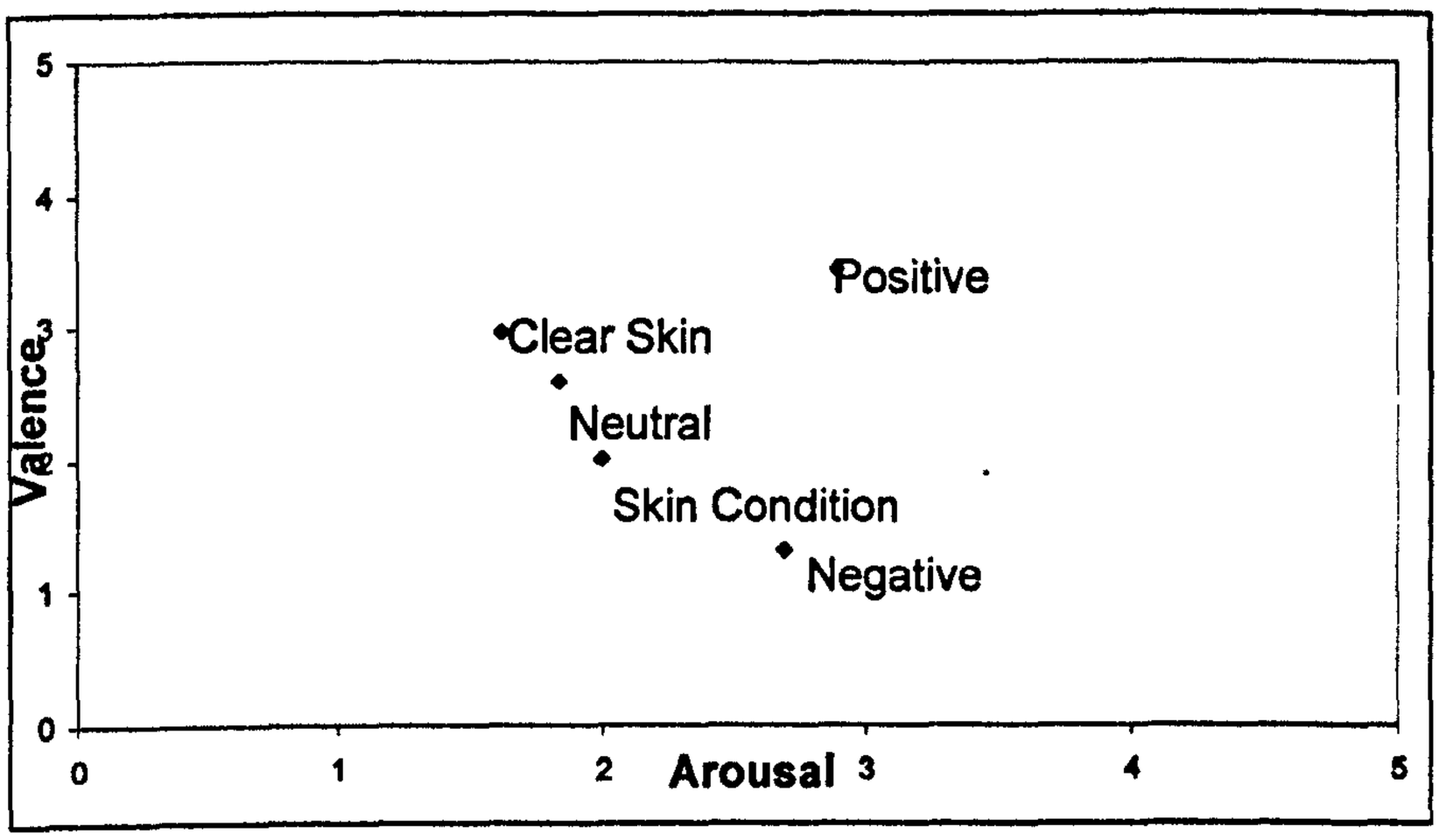


The corrugator supercilii did not show an effect of EMG by category when looking at just clear skin and skin conditions ($WL=1$, $F(1,61)=.00$, $p=1$).

9.4.3 Self Assessment Mannequin and Ratings

Data were quantified as described in Chapter 5 (5.6.2.1). Figure 9-VIII shows the arousal and valence for the categories in affective space. ANOVAs showed that these groups were statistically different to each other on both valence and arousal. Looking at just clear skin and skin conditions arousal [$t(64)=1.7$, $p<.01$; clear skin $\bar{x}=1.7$, $\sigma=.83$; skin condition $\bar{x}=2$, $\sigma=.84$] and valence [$t(64)=-8.8$, $p<0.001$; clear skin $\bar{x}=2.04$, $\sigma=.53$; skin condition $\bar{x}=2.02$, $\sigma=.62$] were significantly different. There was a significant difference between the clinical and control groups for valence given to skin conditions [$F(1,64)=4.54$, $p<.05$], the clinical group rated images of skin conditions as more positive ($\bar{x}=1.92$, $\sigma=.84$) than the control group ($\bar{x}=2.06$, $\sigma=.84$).

Figure 9-VIII: Arousal and Valence plotted in Affective Space



Knowing someone with a skin condition affected the arousal given to skin conditions [$F(1,64)=9.6$, $p<.01$] and to clear skin [$F(1,64)=4.78$, $p<.05$), people who knew someone reported the images as more arousing. Knowledge also affected the severity rating for clear skin [$F(1,64)=4.05$, $p<.05$] and skin condition [$F(1,64)=4.01$, $p<.05$] those that knew someone reported the severity as lower than those that did not. Gender affected the attractiveness ratings for clear skin [$F(1,64)=3.98$, $p<.05$]; males rated the images as more attractive than females. Males also found images of skin conditions more arousing [$F(1,64)=5.45$, $p<.01$].

9.5 Discussion

The main aims of this study were; to explore implicit, explicit and psychophysiological responses to stimuli of clear skin and skin conditions; to assess how these measures varied according to whether participants currently had a skin condition or whether they were age/gender matched controls; and to look at the role played by psychological factors within these reactions.

9.5.1 Explicit Attitudes

The first hypothesis relating to the explicit measures was that the control group would display greatest negativity towards people with skin conditions. Overall, there was a preference for clear skin on the explicit measures, though a larger proportion of participants indicated preference for those with skin conditions in this study than in Study 1. There were no differences on the thermometer scale according to clinical or control group. The semantic differential was approaching statistical significance ($p=.08$), with the clinical group displaying least

preference. This supports the hypothesis and Mastro et al. (1996) that indicates preference for own group, and also indicates that increased experience has an impact on explicit attitudes. However, the reliability of this result has not been ascertained, as significance was minimal and results were not the same for the second explicit measure; the thermometer scale.

The second hypothesis was that participants with high disgust, appearance schema and shame ratings would display greater negativity towards skin conditions on the semantic differential and thermometer scales. Correlations between these measures and the explicit measures were not significant. There was a correlation between internal motivation and the thermometer scale, indicating that participants with high internal motivation were less likely to prefer clear skin. This result is similar to the result reported in Study 1. Studies 2 and 3 found a correlation with external motivation. As Study 1 and 4 involved the same tasks, it is possible that the tasks within the study affected which form of motivation had an effect. There was also a correlation between the semantic differential and the thermometer scale suggesting they are measuring similar components.

The thermometer scales and semantic differential allow participants to respond quickly with limited thought. However, the limited response options result in data that is not normally distributed, therefore it is possible that the results may not be generalisable. Ideally, future studies would employ a specific scale measuring different components of attitudes toward people with skin conditions, rather than asking for preference between clear skin and skin conditions.

9.5.2 Implicit Association Test

The first hypothesis for the IAT was that participants would prefer clear skin on the IAT. This study found a preference for clear skin, supporting the hypothesis and in line with the previous three studies and the study by Grandfield et al. (2005). The second hypothesis was that the clinical group would have less implicit preference than the control group. However, there were no direct differences between the clinical and control group in terms of their responding on the IAT, this fails to support the second hypothesis and is contrary to expectations based on previous research, Grandfield et al. (2005) and Study 3. The third hypothesis was that high disgust, shame, and appearance ratings would produce greater preference for clear skin. This study did not find effects of the individual difference variables, nor was there an interaction between them.

These results support the previous findings showing an implicit preference for clear skin but were contrary to our hypothesis that there would be a difference between the clinical and control groups and that there would be an effect of shame, disgust or appearance. In the first study there was an interaction between positive self-esteem and the IAT, unfortunately this scale was not included in this study, so it was not possible to explore this interaction further.

Similarly to the previous studies, the methodology and analysis employed closely adhered to guidelines (Greenwald et al., 1998; Nosek et al., 2005). Participant numbers also exceeded guidelines (Hofmann et al., 2005) and were inline with power analyses (see Chapter 5; 5.7). In addition, the current study addresses issues with participant selection identified in previous studies, by selecting participants with a chronic skin condition from dermatology departments and matching them with control participants. This ensured that participants were representative and that people currently experiencing a skin condition were those that had been referred to a dermatologist.

The current study failed to replicate effects within previous studies suggesting that personally experiencing a skin condition may not make a difference in the participants' attitudes to people with a skin condition. However, this study failed to explore how much participants felt the images they saw were representative of their own condition. Research suggests a preference (in-group bias) for people with conditions similar to or the same as their own (Mastro et al., 1996). However, it could be that in covering a range of skin conditions within the study (and having to be flexible on recruitment) that participants did not identify with the images. This aspect could be explored further, future studies could ask participants to select images they felt reflected their own condition and compare this to either clear skin or images they felt were not similar to their own condition. In addition, although the DLQI provided a measure of quality of life this may be different to adjustment, which may also have an impact on their attitudes. A recent study (Teachman, 2006) looking at the stigma of mental health also failed to find a difference between people with mental health problems and those without on the IAT, and explicit measures. This indicates that the finding in this study may be representative and perhaps the earlier studies were finding something intrinsic to knowledge rather than to personal experience of skin conditions.

Some of the participants had limited experience using a computer. As a result, they may have focussed on getting the right answer rather than automating the task, which could have influenced their results. Overall the reaction times in this

study were a lot slower than those in previous studies, this may be due to the larger range of participants and the task being more novel for them than for undergraduates (Sanders, 1998); also participants were older and may have had slower reaction times (Der and Deary, 2006; Luchies et al., 2002).

The correlation between the implicit and explicit measures within this study was not significant, this replicates Grandfield et al. (2005), previous studies within this thesis and is in line with other published literature (Karpinski and Hilton, 2001; Pruett, 2006; White, 2006).

9.5.3 PSYCHOPHYSIOLOGY

The hypotheses for the psychophysiology were that there would be a difference between the clinical and control groups in the degree of arousal and attention paid to images of skin conditions. In particular, when viewing skin conditions the EMG measure was expected to show greater activation of the corrugator supercilii and levator labii muscles. It was also anticipated that the clinical group would have less levator labii activation than the control group. An interaction between disgust, shame and appearance and the psychophysiological measures was anticipated; higher scores on the scales indicating higher attention and arousal, and lower valence when viewing skin conditions.

The psychophysiological data collected within this study was disappointing. The heart rate data showed the expected change over time, but there were no effects of category, group or individual differences. It is unclear why this is the case, there were problems with the equipment, and some participants were removed from analysis. Accounting for these factors though, an effect of category by time would still be expected (Bradley and Lang, 2000, Coles 1994, Hare, Wood, Britain and Shadman, 1971, Libby, Lacey and Lacey. 1973). This is not the case. The data were re-analysed and outliers examined to ensure that the problem was not in the analysis. It is possible that the participants within this study were not as responsive to the stimuli but this seems unlikely considering numerous studies finding these effects. Therefore, it would appear that the problem is in the data collection.

With respect to the EMG data, overall effects of category by EMG muscle were only present within the corrugator supercilii. Participants displaying high preference for clear skin on the IAT had generally greater corrugator supercilii activity when viewing the stimuli (except neutral). There were no effects of group, individual differences or gender. It is uncertain whether this is a reliable finding as basic trends in the data were not present.

In addition to data collection problems, there are additional factors that may explain the poor results. Participants were removed due to collection problems, this will have reduced the power within the study. Attaching electrodes to areas where participants had a skin condition may have increased noise within the signal; however, problems were across both the clinical and control group so this seems unlikely. Participants had already viewed similar images within the IAT, so this may have reduced the novelty of the clear skin and skin condition stimuli; however participants were unresponsive to the IAPS data suggesting this is not the case. Participants were generally older than in the first study, however results do not vary across age so it is unlikely that this accounts for the differences.

9.5.3.1 Self Assessment Mannequin

The SAM results showed the classic boomerang shape suggesting that the images are representative of the categories they are in (Bradley, 2000). In concordance with Study 1, images of clear skin and skin conditions were very close to neutral. Participants within the clinical group rated skin conditions more positively than the control group, possibly because experience of them means they do not view them so negatively (Mastro et al., 1996). People who knew someone rated severity lower overall suggesting that exposure makes them better able to assess severity. Future studies could confirm this by also getting dermatologists to rate the images and see if the people who know someone are closer to the dermatologists' ratings than people who do not know someone. People who knew someone also found the images more arousing, this could be because it had an emotional component as they had personal exposure to skin conditions, this would also fit with Grandfield et al. (2005) finding that people who knew someone exhibited stereotype inhibition as it indicates there are more processes at work. Males rated people with clear skin more attractive than females did, this could be because the stimuli were of females and thus females are less likely to describe females as attractive (this could be assessed by also using male images).

9.5.4 Individual Difference Variables and Gender

On the basis of the literature discussed in Chapter 2 (i.e., Gupta et al., 1993, Marks et al, 1999; Kellett and Gawkrodger, 1999; Kent and Thompson, 2003; Lannigan and Cotterill, 1989; Neil, 2001; Papadopoulos et al., 1999; Thompson and Kent, 2001) it was hypothesised that the clinical population would have higher levels of anxiety, depression, shame and appearance concern than the

control group. The clinical group had higher depression but lower appearance self-evaluation scores than the control group. There was an interaction between group and gender with respect to appearance, such that males remained similar across the groups but females in the clinical group had much lower appearance self-evaluation. This indicates that females with skin conditions are less concerned with their appearance in general. This is similar to the finding by Bentovim (1995) who found that women with a health condition worried less about small changes in their weight and shape. Within the current study it is unclear what this finding represents, it could be that generally they have less appearance concern, or that they are concerned mainly with their skin condition and other aspects of their appearance are less salient to them. Future research could look at condition specific concern and compare it to general appearance concern.

When the clinical group was split according to their dermatology life quality; anxiety, disgust and depression were higher, and appearance self-evaluation was lower for those with most impact of skin conditions on their life. The results concerning depression are in line with numerous other studies (Lawrence et al., 2006; Papadopoulos et al., 1999; Van Loey and Van Song, 2003). Participants experiencing a skin condition had higher disgust scores, this suggests that their sensitivity to disgust has increased. This is contrary to expectations, it was hypothesised that disgust would be lower in participants experiencing a skin condition. Appearance scores were lower for those with greatest impact on their lives, this could reflect competing demands such as attending to pain or treatment. The scale was developed via the use of college students, it could be that the validity within a clinical population is not so high, and that some individual items within the scale may be tapping into avoidance. This is contrary to the overall result above whereby the clinical group had a lower score than the control group.

There were high correlations between skin shame, disgust and appearance. Appearance had negative correlations with the other two measures, indicating that participants with low appearance self-evaluation or motivation had high disgust and shame scores. However, this finding is contrary to expectations, as appearance concern and disgust were thought to be related. It seems that the differentiation within the clinical group depending on life quality may be affecting these results.

9.5.5 Relationship to Visible Difference

The explicit measures and the IAT within this study found an overall preference

for clear skin, this is as expected from the literature (Bull and David, 1986; Heason and Kent, 2001; Kent, 2000; Newell and Clarke, 2000; Porter et al., 1990; Rumsey et al., 1982; Thompson and Kent, 2001; Thompson et al., 2002). As expected participants within the clinical group showed less preference than the control group (this was approaching significance) on the thermometer scale. The SAM showed a similar effect with participants in the control group reporting lower valence for people with skin conditions. These results were contrary to the IAT and psychophysiology, which did not indicate a difference between groups. It could be that the IAT was measuring societal reactions or a hardwired evolutionary response, whereas the explicit attitudes are a product of cognitive factors. Mastro et al. (1996) found that participants preferred people from their own disability groups; this has not been fully replicated within this study. It is possible that disability is different to visible difference or that the participants did not identify with the pictures shown.

Individual differences were explored within this chapter to see whether shame, disgust or appearance schema had an impact on attitudes. Appearance self-evaluation, was significantly different across gender, and an interaction with group (clinical or control) was approaching significance (p=.05). Females within the clinical group had lower scores than the control group; this could lend support to previous research that found people with a disability paid less attention to their appearance (Bentovim and Walker, 1995). In addition, the correlations between the measures indicated that high disgust and skin shame was associated with low appearance self-evaluation and motivation. It is possible that this is schema avoidance, further studies could explore this in detail. This is also the reverse to the results found in Study 1, but the study utilised a non-clinical sample so would not see schema avoidance. As mentioned above appearance schema appears to vary with life quality over the past week. Another possibility is that the scale is not sensitive enough to measure appearance schema in a clinical population; in this case, perhaps measures of shame and disgust are more relevant.

Individual differences did not have an impact on IAT scores or explicit measures; this could suggest that there is no difference between participants in their responses. Further studies with other conditions causing visible difference are necessary in order to explore this further.

9.5.6 Limitations

There were a number of limitations to this study. As discussed in previous studies, the explicit measures could benefit from being developed specifically to

look at skin conditions. The measures were adapted from scales used to assess attitudes to a range of topics; identifying factors pertinent to skin conditions through qualitative interviews then developing a scale may produce clearer results. However, numerous studies have employed these measures for use with the IAT and have found them satisfactory. Many participants were unfamiliar with computers, and it is unclear what effect this may have had on the results, data could have been collated looking at prior use of computers and results analysed to ensure this did not affect the IAT scores. Overall reaction times were longer but this could be due to age effects rather than a result of lack of experience.

The psychophysiological data were disappointing and did not replicate expected basic effects or show results within the studies. Some participant data could not be used which will have reduced the reliability of the study. Future research needs to ensure that the equipment used is reliable.

Generally, within the study, there were problems with recruitment, the initial criteria had to be relaxed, such that participants were selected if they had a chronic skin condition affecting any part of the body, rather than restricting it to the face. In this study 54% (n=21) of the participants were affected at the time of the study on a visible area (face or hands). The criteria were in place so that participants would relate to the images shown, so having a skin condition anywhere may have depersonalised it. Another factor that may have depersonalised the images for males, were that all of the stimuli were of females, it would have been better to use male stimuli for the male group, particularly as the third study found no effect of male or female stimuli. Images within the study depicted a range of skin conditions, it could be that participants only identify with own condition. In addition, this study failed to ask participants how much they related to the images.

Dermatologists ratings of the severity of skin conditions was not assessed as studies indicated this had limited impact on coping; however although the DLQI was administered to assess quality of life, a specific measure of self perceived severity may have been useful to have included.

Depiction of skin conditions within this study could raise the salience of either 'people with a skin condition' or skin conditions (on their own), this is likely to have a different impact on attitudes. Generally, participants would view skin conditions as negative, but this may not be the case when skin conditions and the person are coupled, so they see the person and not the condition. This study did not fully explore knowledge effects because it was felt that personally

experiencing a skin condition would override these effects, a future study could ask a family member accompany the participant so that effects of knowledge could be assessed. In addition, some of the participants in the control group knew somebody or had personally experienced a skin condition in the past, it would have been better if these factors had been eliminated or controlled for within the sample.

Study 1 found effects of self-esteem, it was an oversight to omit it from this study, as it would have allowed the effect of self-esteem to be explored further in relation to attitudes and also within a clinical population.

9.5.7 Overview

This study found an implicit and explicit preference for clear skin, similar to earlier studies within this thesis. Explicit reactions varied according to internal motivation but were not affected by individual differences or knowledge. Similarly, at an implicit reaction level this study found limited effects of the individual differences, and relatively few effects of personally experiencing a skin condition. It is possible that these factors do not affect attitudes. Of particular interest in this study was the unexpected relationship between appearance, shame, disgust and life quality. One tentative explanation for this may be that where appearance is very much an issue and shame is high, such individuals may be engaging in schema avoidance thus leading to a paradoxical score on the appearance measure.

Chapter 10: Discussion

10.1 Resume of Aims

The main aim of this thesis was to explore implicit and explicit attitudes and psychophysiological responses to images of people with a skin condition. The relationship between attitudes and psychophysiological responses to measures of shame, appearance schema and disgust was also explored. In addition, this thesis aimed to assess the relationship of familiarity; knowledge and experience of skin conditions, to these responses and measures of individual difference were assessed.

Four studies were employed, the first study (chapter 6) explored a range of responses towards images of people with a skin condition within an undergraduate sample. The second (Chapter 7) and third (Chapter 8) studies focussed on refining the IAT and exploring the role of knowledge and gender. The second study looked at the effects of personalising the IAT, and examined effects of knowledge in detail. The third study looked at effect of gender within the IAT, both by comparing male and female stimuli, and by balancing male and female participants. The final study (Chapter 9) replicated much of the methodology within the Study 1 but compared a clinical group (people who were currently experiencing a skin condition) with an age and gender matched control group. This provided the opportunity to explore individual differences within a clinical group as well as to look at the effects of shame, disgust and appearance schema in people with a skin condition.

10.2 Summary of Studies

10.2.1 Study 1

The first study built upon a previous study (Grandfield et al., 2005) by exploring reactions to skin conditions in greater depth. This original research employed the IAT and one explicit measure; this was expanded by implementing additional measures. Study 1 incorporated the IAT, psychophysiology, an additional explicit measure and individual difference measures (shame, disgust, appearance schema, self-esteem and motivation). There were significant correlations between the thermometer scale and internal shame and internal motivation. Participants who did not know someone were most likely to show a preference for clear skin on the thermometer scale. These results indicate that within this study, knowledge is a pertinent factor in external attitudes and that the individual differences did not have such an impact.

In the IAT task there was an overall preference for clear skin, supporting observational studies, however this study did not find direct effects of either knowledge or personally experiencing a skin condition. None of the individual difference variables were associated with IAT scores. There was an interaction between self-esteem, knowledge and the IAT. Participants with high positive self-esteem, who knew somebody with a skin condition, displayed less preference for clear skin on the IAT. In contrast, those who did not know somebody showed greater implicit preference for clear skin.

There were no significant differences in heart rate responses to clear skin and skin conditions, nor was there a direct effect of knowledge, or of disgust, shame or appearance. There was a significant difference in responses to all of the stimuli according to whether the participant had low or high self-esteem. Participants with low self-esteem had a greater initial deceleration, suggesting that the stimuli had greater novelty or demanded greater attention from them. Participants' responses differed according to their implicit preference on the IAT task. High preference for clear skin resulted in greater heart rate deceleration when viewing skin conditions, this trend was reversed for low preference for clear skin; they had lower heart rate when viewing clear skin. Supporting this, the RPA found that participants with high implicit preference for clear skin on the IAT had greatest deceleration at time two when viewing skin conditions. In addition, participants with high external motivation had greater initial deceleration when viewing skin conditions. The EMG measures did not find a significant difference between clear skin and skin conditions. Nor were there any effects of the individual differences or experience on the clear skin or skin conditions.

On the SAM, participants rated skin conditions and clear skin as having low arousal and valence. Males rated skin conditions and clear skin as less attractive than females. Males also had significantly lower scores on the appearance scales, disgust and internal motivation.

10.2.2 Study 2

The second study was designed to explore a modification to the IAT (Olson and Fazio, 2004). Category labels were changed to 'personalise' the IAT, in order to detect the participants own attitude rather than societal stereotypes. The modified IAT was compared to the traditional IAT, it was anticipated that the modified IAT would reduce effects of stereotype inhibition. In addition to this, knowledge effects were examined in greater detail; Grandfield et al. (2005) found clear effects of knowledge, whereas the first study found an interaction

but not a direct effect. A possible reason for this difference may have been the additional tasks in Study 1, and their effect on the IAT. Study 2 limited the tasks to the IAT and explicit measures, and participants were recruited according to whether they knew someone with a skin condition. Therefore, the study employed a two by two design.

Study 2 demonstrated that participants preferred clear skin on both the IAT and explicit measures. There were no significant effects of knowledge or personally experiencing a skin condition. However, type of IAT almost reached statistical significance (p=.07), overall participants responded faster on the personalised IAT indicating that they found the task easier. There was an interaction between knowledge, the IAT and the external motivation scale; meaning that people with high external motivation who knew someone with a skin condition had greater preference for clear skin on the IAT. Those with low external motivation showed less preference for clear skin. As anticipated, correlations between the IATs and the explicit measures were not significant.

Participants who knew someone with a skin condition had lower external motivation. On the thermometer scale, low external motivation was associated with a preference for skin conditions or no preference. Participants who had personally experienced a skin condition had lower internal motivation.

10.2.3 Study 3

The third study was developed to explore gender and the IAT in detail, and to try to replicate the knowledge effects demonstrated by Grandfield et al. (2005). The fact that participants in Studies 1 and 2 knew the research was exploring attitudes to appearance may have influenced the findings. In the original study participants were told they were taking part in a reaction time task. Therefore, Study 3 participants were not informed about the purpose of the research. The results of the first two studies may also have been affected by the discrepancy of female to male participants. By balancing males and females in Study 3 this effect was addressed in more detail. The study also aimed to explore why there were gender differences, the possible influence of the IAT stimuli being all female was addressed, as males and females may respond differently to female images. The study employed a two by two design using two IATs, a male and a female, and recruited participants according to gender.

The results showed an overall implicit and explicit preference for clear skin. There was no effect of knowledge on the IAT results, nor were there any interactions between knowledge, the IAT and other measures. However, there

was a direct effect of personal experience of skin conditions; participants who had had a skin condition had less implicit preference for clear skin. There were no gender effects within the study in relation to the IAT. However, males indicated less preference for clear skin than females on the semantic differential. Correlations between the implicit and explicit measures were not significant. Participants who took part in the study who had had a skin condition had higher external motivation than those who did not have a skin condition.

10.2.4 Study 4

The fourth study was designed to assess the effects of currently experiencing a skin condition and to look at the effect of individual differences; shame, disgust and appearance schema, within a clinical population. This was in relation to their attitudinal and psychophysiological responses and to see how these variables differed to a control group. Previous studies had found effects of either knowledge or personally experiencing a skin condition. This study aimed to assess this effect reliably using two groups of participants. The first group were recruited from dermatology departments and were currently experiencing a chronic skin condition. The second were age and gender matched controls. The methodology employed was similar to that in Study 1, using the IAT, psychophysiology and individual difference measures.

There was an overall preference for clear skin on the IAT. However, there were no differences between the clinical and control group in terms of their responding on the IAT, nor were there effects of the individual difference variables. The correlation between the implicit and explicit measures was not significant. Looking at the heart rate and EMG data there were no effects of category, group or individual differences when viewing the clear skin or skin condition stimuli. The clinical group rated skin conditions more positively than the control group. Participants who knew someone rated severity lower overall, they also found the images more arousing. Males rated people with clear skin as more attractive than females.

Participants displayed an overall preference for clear skin on the explicit measures. Responding on the thermometer scale did not differ according to group (clinical/control), though the semantic differential approached statistical significance (p=.08); the clinical group displayed least preference for clear skin. There was a correlation between internal motivation and the thermometer scale indicating that higher external motivation was associated with explicit preference for clear skin.

Looking at the individual differences, the clinical group rated more highly for depression, but lower for appearance self-evaluation scores than the control group. There was an interaction between group and gender with respect to appearance, although the male control and clinical groups did not differ significantly, females in the clinical group reported much lower appearance self-evaluation. When the clinical group was split according to their dermatology life quality; anxiety, depression and disgust were higher for those with most impact of skin conditions on their life. Appearance scores were lower for those with greatest impact on their lives. There were high positive correlations between skin shame and disgust, and high negative correlations between these measures and appearance.

10.2.5 Overview

As predicted, there is a consistent implicit and explicit preference for clear skin in all the studies. The relationship between implicit and explicit measures was non-significant. The effect of knowledge and personally experiencing a skin condition varied across studies and there was limited consistency between them. There are probably multiple factors involved, such as factual knowledge, personal feeling (e.g., compassion, disgust) and personal experience that should be explored in detail in future research.

This thesis explored factors associated with reactions towards visible difference, specifically skin conditions. Two studies assessed psychological factors hypothesised in the literature (Thompson and Kent, 2001) as being implicated in mediating reactions and adjustment (Studies 1 and 4). There has been limited consistency in these results, either across the measures within and between studies The IAT and psychophysiology results did not differ according to these variables.

There were limitations to some of the results, in terms of the explicit measures it could be that the explicit measure was not suitable to compare these scales with, and a more robust continuous measure would produce consistent results, further exploration of this below (10.6). In terms of the IAT, limited correlations with the explicit measure could also indicate that other explicit measures are unlikely to tap into the same dimension. Further IAT studies could use disgust, appearance or shame related measures to ascertain the link between the two at an implicit level. It is unfortunate that the psychophysiology produced such limited response, as the disgust measure on this may have been a way to differentiate.

10.3 Explicit Measures and Psychological Factors

In all four studies, there was an overall explicit preference for participants with clear skin. This finding replicates that of previous research (Grandfield et al., 2005) and supports the literature indicating that people living with a visible difference often receive negative reaction from members of the public (e.g., Bull and David, 1986; Heason and Kent, 2001; Kent, 2000; Porter et al., 1990; Rumsey et al., 1982; Thompson et al., 2002). However, a proportion of participants within all of the studies reported no preference. Initially it was thought that these participants did have a preference but that they preferred not to state it, however it is possible that these participants genuinely did not prefer either group. This could aid understanding of the lack of reactions demonstrated by the IAT and psychophysiology measures. Future studies could compare participants who report a strong preference for clear skin with those that indicate no preference. It would also be interesting to compare these responses across different conditions causing visible differences to see if this result varies. Studies looking at attitudes towards disabilities did not allow participants to state no preference for one disability over another (Deal, 2003; Esses and Beaufoy, 1994; Harasymiw et al., 1976; Mastro et al., 1996).

The internal and external motivation scale to respond without prejudice was adapted for this study because previous studies had found that it had an impact on the IAT task and explicit measures. The studies within this thesis each had different findings in relation to the scale. In Study 1, participants who indicated a preference for clear skin on the thermometer scale had lower internal motivation. However, in Study 2, low external motivation was associated with reduced preference for clear skin on the thermometer scale, yet on the IAT high external motivation was associated with preference for clear skin. The findings in Study 3 showed a correlation between external motivation and the semantic differential. These results are inconsistent, it is unclear why in some cases there is an effect of internal motivation and in others external motivation. One possibility is that there is an effect of the other tasks completed. There is no other literature looking at motivation with respect to skin conditions or visible difference. Further research is needed to explore this relationship in greater depth.

Effects of knowledge and personally experiencing a skin condition were also examined in relation to the explicit measures. In the first, second and fourth studies, participants who knew someone with a skin condition were less likely to indicate an explicit preference for clear skin. In Study 2 participants who had

experienced a skin condition had a lower preference for clear skin on the thermometer scale. These results suggest that increased exposure to skin conditions may reduce negativity. In the final study, responses on the semantic differential were approaching statistical significance (p=.08); the clinical group displayed least preference for clear skin. Unlike the other three studies the thermometer scale did not show this effect. The variation within the results means that the reliability of this finding is uncertain. This finding supports that of Mastro (1996), who demonstrated a preference for own group, however the current finding shows less preference for people with skin conditions in general.

In terms of the individual differences, the first study found a significant correlation between internal shame and the thermometer scale. This was not replicated in the final study, nor were there effects of disgust or appearance schema. It is possible that the element of disgust being explored was insufficient. Research suggests that people are disgusted by wounds (Rozin and Fallon, 1987), and people who are ill (Curtis and Biran, 2001). It has been suggested that disgust is a biological mechanism for avoiding infectious disease (Curtis and Biran, 2001) and that disgust is a behavioural immune system (Schaller and Duncan, 2003). Park et al. (2003) found that people with high scores on a perceived vulnerability to disease scale were less likely to have friends with a disability. Therefore, it may have been of greater benefit to use a vulnerability to disease questionnaire.

Overall, as anticipated from the literature the clinical group had higher depression but lower appearance self-evaluation scores than the control group. However, when the clinical group was split according to the DLQI scale, those with low quality of life had lowest appearance concern, and those with high quality were on a par with the control group. Further research could explore whether this decline in appearance concern is associated with an increase in pain and management time. The dermatology life quality split also indicated that anxiety, depression and disgust were higher for those with most impact of skin conditions on their life. The anxiety and depression scores are in line with previous research (Berk et al., 2001; Lawrence et al., 2006; Papadopoulos et al., 1999; Van Loey and Van Song, 2003). Previous research has shown that disgust is linked to feelings of stigmatisation (Smith, Lowenstein, Rozin, Sherriff, and Ubel, 2007), therefore disgust may have been higher due to other components such as high shame and depression. Another factor affecting the disgust measures within this thesis was the generic nature of the scales, it may be that a scale specifically designed to measure visible difference (or skin) disgust sensitivity would be more effective (Smith et al., 2007). There was an

interaction between group and gender with respect to appearance, such that males between the clinical and control groups did not differ significantly whereas the females in the clinical group reported much lower appearance self-evaluation. This supports research indicating that females have more problems than males (Kellett and Gilbert, 2001), perhaps salience of appearance could offer some explanation for the disparity over gender findings within studies. There were high positive correlations between skin shame and disgust, and high negative correlations between those and both components of appearance schema.

10.4 Implicit Association Test Studies

All four IATs within this study found an implicit preference for clear skin. This finding replicates that of Grandfield et al. (2005) and supports the literature indicating that people with a visible difference receive a negative reaction from members of the public (e.g., Bull and David, 1986; Heason and Kent, 2001; Kent, 2000; Porter et al., 1990; Rumsey et al., 1982; Thompson et al., 2002).

A second finding that was consistent across all of the IATs was the non-significant correlation between the implicit and explicit measures. This result is consistent with other IAT literature which has found correlations ranging from non-significant to moderate significance (Karpinski and Hilton, 2001; Pruett, 2006; White, 2006). Also, an IAT used to look at disability found the correlation to be non-significant (Park et al., 2003). It is difficult to ascertain reasons why the correlation between the implicit and explicit measures is low whilst there is so much debate about the relationship between the two within the literature. Consideration should also be given to differences between the measures, within the IAT participants are required to respond to images of individuals with skin conditions, whereas in the explicit measure they are asked to rate groups of people with skin conditions and groups of people with clear skin separately, along several dimensions, without viewing images. An increase in correlation may be anticipated if the explicit measure were similar to the implicit measure. For example, the participants could be asked to rate each image according to how pleasant or unpleasant they found them. As the measures stand, the correlation depends on affect being rated similarly by both measures.

Effects of knowledge were also explored. There were no direct effects of knowing someone within any of the studies. However, within Study 3 there was an effect of personally experiencing a skin condition; participants who had had from a skin condition had lower implicit preference. Study 4 examined effects of

experiencing a skin condition by comparing a clinical sample recruited from a dermatology department with a matched control group. No effects were found. Within Study 1 and Study 2, there were interactions between knowledge, the IAT and an additional variable. Study 1 found that knowledge coupled with high self-esteem was associated with reduced preference for clear skin on the IAT, this supports the literature suggesting that low self-esteem is associated with a tendency to stigmatise (Heatherton et al., 2000). Study 2 found that knowledge and high external motivation was associated with increased preference for clear skin on the IAT. These results are difficult to interpret. Studies 1-3 suggest that if knowledge or personal experience of a skin condition were measured accurately that there might be an impact on the IAT. However, Study 4, the most robust in terms of personal experience of skin conditions found no differences between groups. This suggests that there may be an additional factor involved. A variable this work does not address is how much factual knowledge participants had about the conditions. This may be important as skin conditions are often associated with misconceptions (Alderman, 1989; Green and Sinclair, 2001; Murray and Rhodes, 2005; Smithard et al., 2001). Research looking at disability found that attitudes are affected by knowledge about cause and how much control people are perceived to have over their condition (Esses and Beaufoy, 1994). Future studies could explore the effects of factual knowledge on attitudes to skin conditions and see if this accounts for the variability of results.

There are two further possibilities that may account for the differences with study findings. First, in Study 3, less than half of the participants who had personally experienced a skin condition were ongoing, and only one had been referred to a dermatologist, perhaps improving or mild skin conditions have a different effect to currently experiencing a skin condition. This is supported by the finding that participants in the third study who had had a skin condition had higher external motivation than those who did not have a skin condition. The second possibility is that the participants in the final study were older. It is possible that attitudes change with age; this could be explored in greater depth by comparing different age groups responses on the IAT.

Another surprising result was that the gender effects in the study by Grandfield et al. (2005) were not replicated. The first two studies did not include enough male participants to produce a reliable result, but Study 3 was designed specifically to address gender effects and Study 4 included an adequate male to female ratio. It is unclear why this is the case; one possibility is that the stimuli used in the first study were closer to the age of the participants, so there may

have been an element of attraction.

10.5 Psychophysiology Studies

Two studies employed psychophysiology to explore differences in arousal, attention and emotion when viewing images of clear skin and skin conditions. In Study 1, there were no differences in heart rate or EMG responses to clear skin and skin conditions within this study, though heart rate responding to the IAPS as expected (Hare, 1973; 1959; Lacey et al., 1963; Lang and Hnatiow, 1962; Turpin, 1986). Participants with high external motivation and/or participants with high preference for clear skin on the IAT had greater initial deceleration when viewing skin conditions, this suggests that they found the stimuli more novel or interesting. These results are limited and hard to interpret on their own, particularly as there was not a significant difference overall between the two sets of stimuli. Study 4 aimed to enhance these results but unfortunately the results were not successful. The psychophysiology failed to support the literature in terms of responding to the IAPS images.

Also, although the images were rated similarly to the neutral images on the SAM scale, heart rate responses were far less for skin conditions and clear skin than for the neutral imagery. This suggests that participants attended less to these images.

10.6 Limitations

This section will review some of the limitations of the studies within this thesis.

10.6.1 General Limitations

10.6.2 Skin conditions

All of the studies were designed to explore attitudes towards skin conditions, rather than visible difference in general. This had a number of advantages and disadvantages. The advantages of this approach were that skin conditions were relatively accessible; this meant that effects such as knowledge and personal experience of skin conditions could be explored in detail. However, it is unclear how generalisable the results are to other forms of visible difference. Many people have encountered people who have a skin condition; this could have resulted in reactions that are more diluted than reactions to less common visible differences (e.g. cleft palate, birthmarks, burns). Whilst it can be hypothesised that the same factors are in play, this has yet to be proved conclusively.

The area researched was specific, but skin conditions vary considerably; in their

appearance, their commonness and their severity. This produces an element of doubt over whether the results are generalisable. Generalisability within skin conditions is particularly salient when comparing clinical and control groups. It may have been that the results would have varied more between groups if the images shown were more representative of the clinical groups' skin conditions. There was no measure in place to see to what degree the participants identified with the images they were shown. Allowing participants to select images they felt reflected their own condition and comparing these may have produced different results. Mastro et al., (1996) noted that whilst people with a disability identified with their own broad disability group when mixed with the 'general' population, when the groups became more defined (e.g., amputees), so did the identification, and similarities between themselves and others became more specific. It is possible this is the same with skin conditions.

The advantage within earlier studies of being able to look at knowledge effects in the earlier studies may have been a disadvantage for the clinical study. Many participants in the control group reported having previous contact with people who had a skin condition, and many had personally experienced a skin condition in the past. Given the overlap in earlier studies between knowledge and personal experience of skin conditions, this may have been an additional explanation for the lack of differences between the two groups.

Future research looking at attitudinal responses could explore whether there are differences between individual skin conditions. For example, if disgust is a factor in attitudinal responses, skin conditions with disruption to the skin such as acne may result in greater negativity than conditions such as vitiligo (Schienle et al., 2001). This could allow predictions to be made about variations in attitudes when looking at less common, more noticeable visible differences. Given the limited significance in some of the studies, it may be better to compare rarer visible differences, such as facial burns and cleft palate. This thesis suggested that there might be larger effects witnessed within the IAT, psychophysiology and the individual difference measures to visible differences, other than skin conditions. Comparing two forms of visible difference would allow this to be ascertained; and if correct enable a better understanding of the attitudes. In addition, utilising two different visible differences would allow variations in responses to be determined. This would also allow effects of knowledge and personal experience of skin condition to be measured more accurately. This could be done by asking participants in the clinical group to recruit friends, so that the people with a skin condition, people who know someone with a skin condition and a control group (who have neither personally experienced a skin

condition nor know someone with a skin condition) could be compared.

10.6.2.1 Stimuli (Clear Skin/Skin Conditions)

The stimuli used in this research were images of people with various skin conditions, and matched control images; these have a number of limitations. First, in order to maintain confidentiality the images had black squares obscuring the eyes, but this tends to have a depersonalising effect. Ideally it may have been beneficial to use images where the whole face could be clearly seen. It may be that the black squares on the eyes explain the difference between those images and the images used from the IAPS. Participants may have found the images less interesting due to the lack of eyes. Research assessing eye scanning behaviour when looking at faces notes that the eyes are the first component looked at, and then returned to several times (Jack, Blais, Scheepers, Fiset and Caldara, 2007).

Although the images were matched across groups, the pictures were of two different people; it may have been beneficial to use images of the same person for both sets of photographs. This could have been accomplished in a similar manner to Rumsey et al., (1982); using people without a skin condition but applying make up so that they appeared to have a skin condition for one set of photos. An alternative could have been to use participants with a skin condition and to edit the photos using Photoshop (or similar software) to remove any blemishes. This would ensure that any differences in reactions between the groups were due to the skin condition rather than differences between people pictured.

The final point is less easy to address within quantitative research. Viewing images of people may produce different responses to standing face to face with someone. In this situation, implicit and explicit attitudes combine with many other factors to produce the reactions and responses that the person with a visible difference witnesses. In a lab, the reactions are likely to be affected less by emotional responses, and the participants are possibly less in tune with the person. Addressing this problem in quantitative research is difficult whilst maintaining ethical standards. One solution could be to use short videos of the participants, this would have the effect of grounding them in the 'real' world, however ascertaining continuity across video clips may be difficult. Analysis could also be problematic. Another option could be to add an element to the research in which the participant interacts with someone with a visible difference (real or made-up). For example, this could be when entering or leaving the building to take part in the research. This may be difficult because

timing may have an impact. If contact occurred before the research, responses on the tasks may be affected, if contact occurred after the research, the tasks completed may affect their behaviour. Similarly the research could be completed by an experimenter made up to appear visibly different and the results compared with the experimenter without the make-up, in a similar manner to IATs researched using black and white experimenters (McConnell and Leibold, 2001). However, in light of research suggesting that people made up with a visible difference affects how they themselves act (Strenta and Kleck, 1985), this may not be viable or reliable.

10.6.2.2 Location of Skin Condition

This thesis utilised images of people with a skin condition on their face. Evidence from the published literature suggests this area causes the most distress to participants. It was also considered the area participants were most likely to have witnessed on others. Future studies could also consider the areas of the face affected, conditions affecting key areas used in communication or face processing (such as nose and eye areas) may have more effect than areas affected outside this region, such as the hairline. The initial aim for Study 4 was to recruit a clinical group who had a skin condition affecting their face. However due to the time constraints and power demands, this criteria was extended to include other areas of the body. Analysis did not indicate a difference between participants with visible versus non-visible skin conditions but this may have depersonalised the task further for them, such that they did not identify with the images. Alternatively, perhaps personalisation of the images was not necessary.

10.6.2.3 Gender Differences

Consistent gender differences were not demonstrated throughout the thesis. However, gender was not adequately controlled within all of the studies. Study 3 attempted to ascertain whether gender differences were a result of the stimuli within the IAT or of the gender of the participant, but failed to find any differences. Suggestions for the disparity could be different ratios of male to female participants within the experiments; using female stimuli; and closeness of age of the participants to the stimuli. In light of the variation, future studies should carefully control for gender, either by only using one gender within the research or by ensuring sufficient sample sizes for gender to be explored in depth. Additional limitations such as the gender of people featured within any stimuli should also be monitored.

10.6.2.4 COMPUTERISED TASKS

There was a concern that using a computer may have influenced the results of the final study. Some of the participants had limited experience using a computer but it was unclear whether this was the cause of the longer reaction times on the IAT. A possible means of remedying this would be to use a setup synonymous to a television, as it is likely people would be more comfortable with this means of participation. Participants could use a device similar to a remote control in order to respond to the task.

10.6.2.5 DESIGN

This section considers the main design of the experiments; careful consideration is given to each of the methodologies later in the chapter (10.6.3.3, 10.6.3.4, 10.6.3.5, 10.6.3.6).

The studies within this thesis were exploratory designs assessing individual differences documented in the literature as possible contributors to attitudinal differences. Therefore, a range of methodologies and questionnaires that had not previously been used to explore attitudinal responses to visible differences were implemented. Alternative means of looking at attitudinal responses could have been to use qualitative studies in order to gain a deeper insight into underlying thoughts and emotions. The benefits of this form of research are that a lot of detail can be gathered. However, participant numbers would have been limited and exploring a wide range of variables would have been difficult. In addition, this methodology limits the generalisability of the research and undermines the main aim; to quantify the responses.

In terms of adapting the current design, one of the individual difference variables could have been focussed on in detail. Literature indicated that disgust was a likely factor in attitudinal responding. Therefore, this could have been controlled. Participants could have been screened using a disgust measure; the ones scoring highest and lowest could have been recruited to take part in the main research. This would have allowed the measure to be compared on two extremes rather than as a continuum. In addition, a disgust category could have been included with the psychophysiology; this would have allowed the responses for the skin condition stimuli to be compared with the disgust category to ascertain the operation of disgust at an implicit level. A limitation of this form of participant selection is that it limits the variables assessed in detail.

10.6.3 Main Research

10.6.3.1 Knowledge and Personal Experience

Knowledge and personal experience of a skin condition were explored in all of the studies in this thesis. The findings varied between studies and none of the studies replicated the findings of Grandfield et al. (2005). Various suggestions for this have been made throughout the thesis; however, a conclusion has not been reached.

Studies completed with 'unusual' visible differences may allow understanding of this to be reached, as groups can be defined specifically according to knowledge, personal experience and a control group with neither of these. It is unlikely that people will have had exposure to people with a visible difference that they do not remember or report. In addition, exploration of the relationship to the person can be investigated in a controlled manner.

In addition, it is worth considering how participants understood the phrase 'know someone close to you'. There was an implicit assumption on the part of the experimenter that this encapsulated them having a close, loving relationship with the person. However, both 'know' and 'close' could have been interpreted differently. This was supported by the addition of a question in Study 3 asking how participants considered their relationship to be with the person. However, the phrase may not always have measured this component and may have encompassed additional factors for some participants. These may include not only 'knowing' someone but also having an understanding of the implications and the impact of suffering from a skin condition. Participants may also have had factual knowledge about skin conditions, their causes and their treatment.

Factual knowledge is likely to be an important element that this thesis did not explore. Evidence from the literature suggests that the attributions participants give to people with a disability or visible difference have an impact on how they respond to them (Albrecht et al., 1982; Weiner, et al., 1988). Therefore, participants who have a balanced knowledge base are likely to have different reactions to participants with no knowledge or unrealistic beliefs. It is important to explore this dimension in the future.

10.6.3.2 Explicit Attitudes

Measures of explicit attitudes were made via thermometer and semantic differential scales. The results were not normally distributed because participants tended to select 'no preference' on the measures. One possibility to overcome this would be to force participants to make a choice by removing the

'no preference' option. This would be a sensible solution if participants were thought to be conforming to social desirability. However, it is possible that participants genuinely have no preference and removing the option to state no preference may not represent the results. A second more desirable option would be to develop a scale specifically to measure explicit attitudes towards skin conditions along a range of factors, for example appearance or feelings about the person with the skin condition. A development such as this would have important implications for research in the field.

The dimensions used within the semantic differential were utilised as they had been implemented in a previous study alongside the IAT. However, they may not have been the most appropriate dimensions to apply in the present research. Exploration of pertinent factors to visible difference, possibly using a small qualitative study, could be appropriate. In addition, the thermometer scale asked participants how warm they felt towards people with a visible difference. 'Warmth' can be difficult to understand and to measure, but was utilised as it had been used within many IAT studies previously (e.g., Greenwald et al., 1998). Asking participants how they felt towards the group generally may account for some of the difference between the implicit and explicit measures. An alternative may have been to ask participants to individually rate each of the images they had viewed, or a representative subset, in a similar manner to the SAM task.

Evidence from the disability literature (Esses and Beaufoy, 1994) suggests that how 'blame' is attributed to the person with the disability has an impact on attitudes, this component was not explored. Developing an understanding of the factors participants attributed to skin conditions and whether they thought the participant had any control over them may have had an impact on the results.

10.6.3.3 Individual Differences

The main limitation of the individual difference scales was that they were not specifically designed to measure skin conditions. Therefore, it was not possible to compare the results with previous research. In addition, specifically designed scales may have yielded different results. For example, one of the disgust scales measured different domains of disgust but there was not a domain specific to skin conditions or visible difference. There are elements indicated by the literature as likely to be important that were not measured. In terms of disability there is evidence that vulnerability to disease underlies the disgust response (Park et al., 2003), this could be explored in greater depth.

Study 1 demonstrated effects of self-esteem, but this scale was not included in the subsequent studies. This deserves further exploration. Social desirability may also be relevant, it would allow a better understanding of the thermometer and semantic differential scales, and may be a factor that affects responses on the IAT.

10.6.3.4 Implicit Association Test

There were a number of limitations to the IAT. The first involves interpretation of and therefore the implications of the results. Implicit attitudes are thought to be formed through repeated exposure; which could be due to stereotypes, social knowledge, knowledge gained through books and other sources, and experience. It is likely implicit attitudes are an interaction of all of these components (e.g., Ashburn-Nardo et al., 2001; Augoustinos and Reynolds, 2001; Brendl et al., 2001; Devine, 1989; Perugini et al., 2007). In this sense, it is hard to ascertain exactly what information the implicit response reveals. The attitude could be societal or individual.

The personalised IAT was implemented for this reason. Differences between it and the traditional IAT were approaching significance. However, the difference was in overall reaction times rather than preference or effects of knowledge. It is possible that the inclusion of additional participants may have increased the difference to statistical significance but this would not offer any new information. There was uncertainty whether the personalised IAT may serve to make the IAT more explicit, as the new labels made what it was looking for more obvious. In order to investigate this further, a study could be completed also depersonalising the IAT, to see how that affects the results.

A problem specific to the IATs was in understanding how participants perceive skin conditions within the implicit test. The IAT stimuli form a representation of the group (Mitchell et al., 2003; Steffens and Plewe, 2001). Therefore, participants may perceive the group as being 'skin conditions' rather than 'people with skin conditions'. If they were judging skin conditions without the person then they would consider them negative. The explicit measures specifically asked participants how they feel about people with a skin condition; it could be that both tasks measured different elements, and as such, correlations between the implicit and explicit measures would be low. It is possible that different aspects are salient in different circumstances; when the participant has no knowledge of skin conditions, they perceive the person and the skin condition as the same (i.e., a person with a skin condition) but when they do have knowledge, the judgement may be based on the skin condition.

Participants understand how difficult it is to live with a skin condition so feel negative towards skin conditions, but not towards the person with the skin condition. This would account for some of the disparity between the implicit and explicit measures; the explicit measures directly ask how they feel about people with skin conditions as a group.

Study 2 personalised the IAT by altering the phrases 'pleasant' and 'unpleasant' to 'I like it' and 'I dislike it'. Consideration could be given to other ways to personalise the IAT to make it more relevant to skin conditions. An example of this may be to alter the headings and alter the pleasant and unpleasant words to coincide with this.

There is some evidence to suggest that using words rather than pictorial stimuli within the IAT produces more reliable results (Greenwald and Nosek, 2001). Implementing words would remove the 'person' element, as the words would be descriptive of skin conditions rather than people with skin conditions. Similarities between the results would indicate that both IATs were measuring a similar dimension; whereas differences would indicate that pictorial IATs measure the person with the skin condition. The possibility of using images of the same person, with and without a skin condition, was mentioned above (10.6.2.1). This would also enable other implicit tests, such as priming to be used, and a greater understanding of the IATs finding may be possible.

Another option for future research could be to employ the single category implicit association test (Karpinski, 2006), so implicit attitudes towards skin conditions could be explored without the need for a 'clear skin' condition. This would be useful, as matching across groups would not be necessary meaning that concern about similarities would be reduced. The reduced need for balancing would allow photographs of the participant, or pictures representative of their condition to be utilised more readily.

Perhaps, an alternative way of implementing the IAT is as a means to measure change after interventions. As such, how the attitude developed is no longer so important, the focus is shifted to understanding elements that may impact on the attitude or behaviour the person displays (Perugini, 2005). Using a focussed intervention would allow variables to be set, and the effect of them to be accurately measured. In this sense, the studies completed have allowed us to determine that there are many factors involved within the implicit attitude; interventions will allow these factors to be explored in detail. For example, effects of knowledge can be measured by showing participants videos and seeing the impact this has on their responses, or by priming them with pleasant

stimuli before viewing skin conditions.

10.6.3.5 Psychophysiology

The greatest limitation of the psychophysiology was the lack of results for all stimuli in the fourth study. However, there are also several limitations with Study 1. Future research needs to ascertain the reliability of the psychophysiological equipment. Variability in psychophysiology according to the skin condition and clear skin stimuli was not significant in either study. It may be that the stimuli of skin conditions and clear skin were not different enough (this is discussed in more detail in 10.6.1.2). Another possibility is that the high valence of the pleasant and unpleasant IAPS images reduced responses to the other images. Blocks were counterbalanced such that one of each of the five images was included in each set of five. Showing blocks of five images of each type instead, may have produced responses that are more consistent. The IAPS stimuli chosen were on the basis that they had previously been used with a UK sample (Bywaters, 2004). Future studies could select stimuli that were more representative of the clear skin and skin condition stimuli, to try to minimise differences.

Disgust effects via levator labii activation were not found in response to the skin conditions. It is difficult to ascertain whether this is a result of the equipment failing to measure disgust, or whether disgust was not present. The negative stimuli only contained two disgust images and both were associated with blood; future studies could add a disgust category so that the efficacy of the measure can be assessed.

An interaction between IAT responses and heart rate was found. Future studies with functioning EMG may find that positive and negative emotions also interact with the IAT.

10.6.3.6 SAM and Rating Scales

The SAM was administered to ensure that ratings of the IAPS images were representative of the literature and to determine where the skin condition and clear skin stimuli lay in relation to these. There were no apparent limitations of this methodology. Some studies ask participants to rate each picture after they have first seen it, this may have allowed judgements to be made about habituation effects, and that ratings may have been higher immediately after the first viewing, also it would ensure that participants were paying attention to the images. However, this prolongs the psychophysiology task, and may disrupt the electrodes, as the participants need to move to complete the task.

Participants who knew someone rated severity lower overall, suggesting that exposure reduces how severe they perceive the conditions to be. Future studies could also utilise dermatologists' ratings of the severity of the images to see if the people who know someone are closer to the dermatologists' ratings than people who do not know someone. In addition, exploration of severity ratings and attitudinal responses could be beneficial. It may be that as severity perception is reduced so is negativity.

10.7 Future Research Assessing Attitudinal Responses

This section aims to look at the implications of the findings of the thesis for further research within the field.

10.7.1 Skin Conditions Versus the Wider Field of Visible Difference

This research focussed on skin conditions as a group. The rationale was that using skin conditions would make effects of knowledge easier to measure and that it would be possible to recruit a large clinical group. However, this resulted in limitations. The first was that although a small area of visible difference was examined, a wide range of different skin conditions could still have been explored individually. The second was that by using a condition that participants were relatively familiar with, it was uncertain how generalisable the results would be to a less common, more severe visible difference. This may also have accounted for the limited statistically significant effects found.

Recommendations for future studies would be to use a less common visible difference such as images of people who have burns, cleft palate or birthmarks.

10.7.2 Stimuli

Future studies should consider their stimuli carefully. The images used within this study were of people with a skin condition and those without. All images had black rectangles obscuring the eyes to maintain anonymity. It was felt that the rectangles may have depersonalised the images. In addition, using different people within the clear skin and the skin condition stimuli meant that the images within the groups were of different people. Although steps were taken to ensure the groups were not statistically different to each other in terms of attractiveness, they may have differed on many other dimensions. Using the same participants within each group would minimise these. The images used within Studies 1, 2 and 4 were of female participants. This led to problems interpreting gender effects.

Images from the IAPS were selected on the basis that they had been validated with a British population (Bywaters, 2004). However, in terms of their similarity to the clear skin and skin condition stimuli there could have been a better selection.

Therefore future studies should aim to use the same people within each group (albeit one made up or edited to have a visible difference), and all of their face should be clearly visible. Images should try to include both genders. If images are selected from additional sources, i.e., the IAPS, then care should be taken to ensure similarities between the two.

10.7.3 Knowledge Effects

The knowledge effect measured in each of the studies was variable. It is likely that this is due to 'knowledge' being used to encompass a range of meanings and having a lack of clarity. Future research should separate knowledge into different components. For example, participants may be asked if they have any relatives, friends or a partner with a visible difference. They could then be asked to describe their relationship further, to talk about how much they know about the visible difference. This could include the impact upon the person, the amount of discomfort it causes them and how much factual knowledge they have. An additional question could be how much their condition affects the participant.

10.7.4 Implicit and Psychophysiological Measures

The implicit measure (IAT) produced inconsistent results. It is not recommended at this stage that the IAT be used to ascertain attitudes in future studies. This is due both to the inconsistent results and to the difficulty in reliably interpreting the findings. However, the IAT may be useful in measuring the effects of interventions or implicit attitude change. Using the IAT to measure the effect of interventions could involve asking participants to watch a video. In one group the participants could watch a video talking positively about visible difference, there could also be a control group, and possibly, depending on the ethical implications a group watching a program portraying visible difference negatively (e.g., Beauty and the Beast or The Hills Have Eyes). Completing the IAT after viewing these would allow the effects of positive exposure to visible difference to be ascertained.

Implementing the IAT to measure implicit attitude change could be done over a period of time. The IAT has high retest reliability (Greenwald et al., 1998), therefore the IAT could be utilised at the beginning of a study, various

interventions put into place and then repeated at the end of a study. A third use of the IAT may be within a clinical population. Participants' level of negativity towards themselves could be measured by putting personal images and relevant words into the IAT, in a similar manner to self-esteem IATs.

Recommendations for future psychophysiological studies would be to ensure the effectiveness of the equipment and to follow recommendations for stimuli suggested above (10.7.1, 10.7.2).

10.7.5 Explicit Measures

The explicit measures asked participants to rate people with skin conditions and people with clear skin on two dimensions. This assessed how they felt towards the group as a whole. However, the dimensions were used in previous IAT studies and only allowed a rudimentary view of how participants felt about the two groups to be gained. Future studies should either aim to develop a scale based upon qualitative research to assess attitude or to ask more in-depth questions to gain a richer view of attitudes.

10.7.6 Individual Difference Measures

The main individual differences explored were disgust, shame and appearance schema. In terms of their usefulness in predicting differences within implicit responses, there were no statistically significant results. It is also not possible to comment about their usefulness in ascertaining differences in physiological activity due to the lack of reliability with the physiological data. At an explicit level Study 1 found a relationship between the thermometer scale and shame. This was the only study to do so. Relationships between the explicit measures and disgust and appearance schema were not found.

All of the studies found a relationship between motivation and the thermometer scale. Studies 1 and 4 found a relationship with internal motivation and Studies 2 and 3 with external motivation. Future research would be beneficial to ascertain causal elements, i.e., does motivation influence attitude or vice versa.

The first study also measured self-esteem and found a relationship with responses in the IAT. This measure may elicit useful results in future studies. In addition there was no measure of social desirability, this factor may affect explicit results therefore including a measure of this may glean further information. The disability literature has shown a relationship with vulnerability to disease (Park et al., 2003), this is also a measure that may be useful within this field.

Therefore, recommendations for future research would be to investigate motivation in greater depth. Consideration should also be given to including measures of self-esteem, vulnerability to disease and social desirability. Investigating shame, disgust or appearance schema further in relation to the explicit measures, or the IAT or the psychophysiology is not recommended until further support for their usefulness is found.

10.7.7 Attitudes within a Clinical Sample

A clinical sample was recruited in Study 4 to determine how their responses differed from a control group. However, many participants within the control group reported having suffered from a skin condition in the past. Therefore, it is likely that they may have had many similarities to people within the clinical group. Participants within the clinical group also varied such that they had had their skin condition for differing lengths of time, and there were varying reports as to its severity. It is likely that all of the participants in both groups were in fact on a continuum in terms of their responses on the measures, rather than being two distinct groups.

With respect to the IAT, little attention was paid to how much the clinical group identified with the images. Rather, there was an expectation that they would do so. It is imperative that future research consider this issue, possibly asking participants to personally select stimuli that they do identify with.

Future studies may wish to explore attitudinal responses further in the general population before looking at differences between groups. However, if a study is designed to ascertain differences, careful consideration should be given to ensuring the differences between the two groups, perhaps also assessing them on a scale of appearance concern.

10.8 Implications and Summary

This thesis consistently found that the participants held negative attitudes towards people with skin conditions. This finding lends experimental support to the existing literature, which has largely been based on anecdotal accounts and observational studies (e.g., Bull and David, 1986; Heason and Kent, 2001; Kent, 2000; Porter et al., 1990; Rumsey et al., 1982; Thompson et al., 2002). However, the findings here suggest that such reactions are implicit; that is deeply rooted and automatic. As with other IAT research, it is somewhat difficult to clearly state whether this finding reflects an internalisation of well-established societal stereotypes, or whether it reflects a personal or biological reaction.

Importantly, it strongly suggests we should be preparing affected individuals to manage such reactions and to 'normalise' them as inevitable rather than to personalise them.

In addition, the impact of knowledge and personal experience of skin conditions upon attitudes was explored. The findings were inconsistent, with some forming interactions with other measures and some studies finding a direct relationship. Three studies found an effect of knowledge, and one of those also found an effect of personal experience of a skin condition on the explicit measures. The inconsistency within the results indicates that further exploration of the effects of knowledge should be undertaken. These results provide support for community interventions such as those implemented by 'Changing Faces'.

Future research could also look at the attribution participants hold regarding the cause of a visible difference or disability, and investigate the effect of increasing factual knowledge upon their attitude. People with a visible difference could be encouraged to talk about the facts behind their visible difference, such as causes, feelings and treatments.

The results of the clinical study supported previous research in that the clinical population had higher depression, anxiety and shame (e.g., Kellett and Gawkrodger, 1999; Kent and Thompson, 2003; Picardi et al., 2004; Rumsey et al., 2004). Disgust scores were higher in the clinical group than the control group, and highest with lower quality of life. This is the first study to investigate disgust in relation to skin conditions and visible difference. Disgust, shame and feelings of being stigmatised are closely related (Power and Tarsia, 2007; Marzillier and Davey, 2005, Smith, et al. 2007), and as here, have been found in some other populations (colostomy patients), to be associated with lower quality of life (Smith, et al. 2007). Interestingly, Marzillier and Davey (2005) found that anxiety induces disgust but not vice versa. Disgust is associated with a negative interpretational bias but does not allow emotional responses to be made, (Davey, Bickerstaffe, and MacDonald, 2006) therefore disgust may maintain anxiety. Further research is needed into the relationship between disgust and shame and distress in people living with a visible difference.

Clearly, the findings here indicate that clinicians need to begin to assess for disgust and shame in individuals distressed in relation to their visible difference. Further research is needed to develop both assessment tools and specifically targeted interventions to address these effects.

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TABLE OF APPENDICES

Appendix 1:	Ethical Approval (NHS)	230
Appendix 2:	Example Information Sheet (Study 4)	231
Appendix 3:	Example Consent Sheet (Study 4)	233
Appendix 4:	Example Debrief Sheet (Study 3)	234
Appendix 5:	The Disgust Scale (Haidt)	235
Appendix 6:	Davey Disgust Scale	237
Appendix 7:	Appearance Schema Inventory – Revised Scale	238
Appendix 8:	Other as Shamer Scale	239
Appendix 9:	Internal Shame Scale	240
Appendix 10:	Skin Shame Scale (SSS)	241
Appendix 11:	Hospital Anxiety and Depression Scale (HADS)	242
Appendix 12:	Dermatology Life Quality Inventory (DLQI)	243
Appendix 13:	Internal and External Motivation Scale	244
Appendix 14:	Thermometer and Semantic Differential	245
Appendix 15:	Demographic Variables	247
Appendix 16:	Scale to Rate Picture Groups	248
Appendix 17:	Ratings For Picture Groups	249
Appendix 18:	List of Skin Conditions	250
Appendix 19:	Pictures of People with Skin Condition	251
Appendix 20:	Pictures of People with Clear Skin	252
Appendix 21:	IAT Instructions	253
Appendix 22:	IAPs Stimuli	256
Appendix 23:	IAPs Numbers of Stimuli	257
Appendix 24:	Blocks of Pictures Within Psychophysiology	257
Appendix 25:	Psychophysiology Instructions	258
Appendix 26:	Self Assessment Mannequin	259
Appendix 27:	Scales; Attractiveness & Severity & Screenshots	260
Appendix 28:	SAM Instructions	261
Appendix 29:	Example Recruitment Poster (Study 1)	262
Appendix 30:	Counterbalance Sheet	263
Appendix 31:	Post Hoc Power Analyses	264
Appendix 32:	Male Pictures	265
Appendix 33:	Email Sent to Potential Control Participants	266
Appendix 34:	Second E-mail Sent (Example)	266

Appendix 1: ETHICAL APPROVAL (NHS)

Sheffield Teaching Hospitals NHS
NHS Trust

Ref: DP/STH13945

14 February 2005

Dr AR Thompson
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Authorisation of project

STH ref: STH13945
Study title: Psychological predictors of attitudinal and psychophysiological responses to disfigurement. A comparison of sufferers of visible skin conditions and age matched controls

Chief Investigator:	Dr AR Thompson (University of Sheffield)
Principal Investigator:	Tracey Grandfield (University of Sheffield)
Sponsor:	Changing Faces, London
Funder:	Economic and Social Research Council (ESRC)

The Research Department has received the required documentation for the study as listed below:

1.	**STH registration document: completed and signed**	Dr AR Thompson, 20-Nov-2004
2.	**Evidence of favourable scientific review**	ESRC
3.	**Protocol – final version**	V1, 16-Nov-2004
4.	**Participant Information sheet – final version**	V1, 16-Nov-2004
5.	**Consent form – final version**	V1, 16-Nov-2004
6.	**Signed letters of indemnity**	University of Sheffield, 09-Nov-2004
7.	**ARSAC / IRMER certificate**	N/A
8.	**Evidence of hosting approval from STH directorate**	18-Jan2005
9.	**Letter of approval from REC**	Barnsley REC, 06-Dec-2004
10.	**Proof of locality approval**	N/A
11.	**Clinical Trial Authorisation from MHRA**	N/A
12.	**Honorary Contract**	22-Oct-2004
13.	**Associated documents** Questionnaires - Internal & External Motivation scale Stigma scale Appearance Schemas Inventory Revised scale Other as Shamer scale Hospital Anxiety and Depression scale Skin Shame scale Dermatology Life Quality Index SAM Rating scales Demographics	V1, 16-Nov-2004
14.	**Grant award**	ESRC, 01-Aug-2003

The project has been reviewed by the Research Department and authorised by the Director of Research on behalf of STH Trust to begin.

Yours sincerely

pp Richard Eastell

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Appendix 2: EXAMPLE INFORMATION SHEET (STUDY 4)

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Attitudes to Skin Conditions

Thank you for expressing an interest in this research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully Please ask if there is anything that is not clear or if you would like more information. Further details of the study can be gained from contacting the number below.

Who is conducting this study?
The study is being carried out by The University Of Sheffield and the Department of Dermatology, Barnsley District General Hospital. The study is being conducted by Tracey Grandfield as part of her doctoral training and under the supervision of Dr. Thompson, Clinical Psychologist, Professor Turpin, Clinical Psychologist, Dr. Sabroe, Dr. Bothwell, Consultant Dermatologists and Dr. Partridge, founder of the charity Changing Faces.

What is the purpose of the study?
People who suffer from a skin condition may experience unwelcome reactions from other people. Understanding the nature of such reactions may be helpful in developing methods of helping people to manage the emotional and social effects of skin conditions in the future.

Am I suitable to take part?
In order for us to understand how people's reactions differ when they actually suffer from a skin condition we are looking for people who suffer from a visible skin condition, which affects their face. We are also looking for a second, control group who do not suffer from a skin condition The participants in this group will be matched to the first group for their age We would also like participants to be over 18 and speak English as their first language.

Do I have to take part?
You are under no obligation to take part. Deciding not to take part will not effect the treatment you receive in any way.

What will be involved if we agree to take part in the study?
There are three things that we would like you to do. There will be questionnaires to fill in which ask questions about how you are feeling and how you would react in certain situations. There will also be two simple tasks asking you to rate pictures and to categorise some words and pictures. There will also be a task in which you sit in a comfortable chair and look at some pictures whilst your heart rate, skin conductivity and muscle movements are recorded. This task involves taking some measurements with specially designed equipment. Specifically, some small (1cm) circular silver discs are placed on the face and fingers and some larger silver plates placed on the inside of the arms. These measure the body's reactions whilst looking at the pictures. This is safe and you will not experience any pain or discomfort.

Can I withdraw from the study at any time?
Yes. You are free to refuse to join the study and may withdraw at any time or choose not to answer certain questions. Withdrawal from the study will in no way effect any treatment that you receive.

(PTO)

When and where will the study take place?
The study will take place in the Psychology Department, of The University Of Sheffield, which is next to the Mappin Art Gallery and Park and near the Hallamshire Hospital and the Childrens' Hospital. We would be able to refund travelling costs and provide you with a parking space if you come in your own vehicle.

How long will the study take?
We expect the study to take about 2 hours.

Will the information obtained in the study be confidential?
Anything you say will be treated in confidence, no names will be mentioned in any reports of the study and all data from the computer tasks will be stored with a number so that you cannot be personally identified.

What if I wish to complain about the way in which this study has been conducted?
If you have *any* cause to complain about *any* aspect of the way in which you have been approached or treated during the course of this study please initially contact the project co-ordinator: *Dr. Thompson on 0114 2226637. You may also* use the normal National Health Service complaints procedures available to you.

Who do I contact if I have any further questions?
If you have any questions or require any further information please do not hesitate to contact **Tracey Grandfield** on **01142 226553** or at **T.Grandfield@sheffield.ac.uk**

Appendix 3: EXAMPLE CONSENT SHEET (STUDY 4)

THE UNIVERSITY OF SHEFFIELD

Department of Psychology

Department Head: Professor J Richard Eiser

Psychology Building
Western Bank
Sheffield S10 2TP – UK
Tel: +44 114 2229272
Fax: +44 114 276 6515
http://www.shef.ac.uk/psychology/

CONSENT FORM

Attitudes to Dermatitis

Name of Researcher: Tracey Grandfield

Please cross out as necessary

1. Have you read the information sheet? YES / NO

2. Have you had an opportunity to ask questions and discuss the study? YES / NO

3. Do you understand that you are free to withdraw from this study at any time without having to give a reason for withdrawing? YES / NO

4. Do you understand that all information will be kept confidential and you will not be identified by name? YES / NO

5. Do you agree to take part in this study? YES / NO

_____ _____ _____

Name (in block letters) Date Signature

Appendix 4: EXAMPLE DEBRIEF SHEET (STUDY 3)

Hi,

Thank you once again for taking part in my research. My aim is to try and establish peoples' attitudes towards disfigurement. The response times from all of your categorisations will be analysed to see if you responded to images with dermatitis faster or slower overall than you responded to images without dermatitis. This will let us know whether you had a more positive association of one than the other, but it will not tell us whether one view is negative or not. We will also look at gender effects – whether males and females respond differently to the task if the pictures are male or female.

This information could eventually lead to effective interventions for people with disfigurements so that they have knowledge of the best way to cope in social situations.

If you would like to know anything else about the research, e.g. the overall results or more information about the IAT you can E-mail me with any queries at T.Grandfield@sheffield.ac.uk

Appendix 5: THE DISGUST SCALE (HAIDT)

DS

Please indicate how much you agree with the following statements or how true it is about you. Please circle the corresponding number to the right of the statement.

Use the scale below:

1 = Strongly Disagree (very untrue about me) **2 = Mildly Disagree** (somewhat untrue about me) **3 = Mildly Agree** (Somewhat true about me) **4 = Strongly Agree** (very true about me)

1.	I might be willing to try eating monkey meat under some circumstances.	**1 2 3 4**
2.	I try to avoid letting any part of my body touch the toilet seat in a public restroom, even when it appears clean.	**1 2 3 4**
3.	It would bother me to be in a science class, and to see a human hand preserved in a jar.	**1 2 3 4**
4.	It would make me uncomfortable to hear a couple making love in the next room of a hotel.	**1 2 3 4**
5.	If I see someone vomit, it makes me sick to my stomach.	**1 2 3 4**
6.	I have no problem buying and using shirts from used clothing stores.	**1 2 3 4**
7.	It would bother me tremendously to touch a dead body.	**1 2 3 4**
8.	It would bother me to see photos of two people having oral sex.	**1 2 3 4**
9.	Seeing a cockroach in someone else's house does not bother me.	**1 2 3 4**
10.	I probably would not go to my favourite restaurant if I found out that the cook had a cold.	**1 2 3 4**
11.	It would bother me to sleep in a nice hotel room if I knew that a man had died of a heart attack in that room the night before.	**1 2 3 4**
12.	It is OK with me if people want to look at pornography involving animals.	**1 2 3 4**
13.	Even if I was hungry, I would not drink a bowl of my favourite soup if it had been stirred by a used but thoroughly washed fly-swatter.	**1 2 3 4**
14.	I would not hold a dollar bill between my lips (like if I needed a free hand), because so many strangers have touched it with their dirty hands.	**1 2 3 4**
15.	If I were properly trained I would be willing to help draw blood for blood donations.	**1 2 3 4**
16.	I think that people who masturbate everyday are degrading themselves.	**1 2 3 4**

How disgusting would you find each of the following experiences? Please circle the number to the right of the statement which corresponds closest to how you feel.
Use the scale below:

1 = Not Disgusting At All **2 = Slightly Disgusting** **3 = Moderately Disgusting** **4 = Very Disgusting**

17. You see maggots on a piece of meat in an outdoor garbage pail.	**1 2 3 4**
18. You take a sip of soda then realise you picked up the wrong can, which a stranger had been drinking out of.	**1 2 3 4**
19. You see someone accidentally stick a fishing hook through his finger.	**1 2 3 4**
20. You hear about a 30 year old man who seeks sexual relations with an 80 year old female.	**1 2 3 4**
21. While you are walking through a tunnel under a railroad track you smell urine.	**1 2 3 4**
22. You sit down on a public bus, and feel that the seat is still warm from the last person who sat there.	**1 2 3 4**
23. You see a man with his intestines exposed after an accident.	**1 2 3 4**
24. As part of a sex education class, you are required to inflate a new unlubricated condom, using your mouth.	**1 2 3 4**
25. A friend offers you a piece of chocolate shaped like dog-doo.	**1 2 3 4**
26. You find out that someone you despise used to live in your house and sleep in your bedroom.	**1 2 3 4**
27. Your friend's pet cat dies, and you have to pick up the dead body with your bare hands.	**1 2 3 4**
28. You hear about an adult brother and sister who like to have sex with each other.	**1 2 3 4**
29. You see a bowel movement left unflushed in a public toilet.	**1 2 3 4**
30. While travelling for 2 weeks with a friend, you discover that your underwear got mixed up in the wash and you are wearing your friend's underwear.	**1 2 3 4**
31. You accidentally touch the ashes of someone who has been cremated.	**1 2 3 4**
32. Whilst walking through a park, you see two dogs mating (having sex).	**1 2 3 4**

Appendix 6: DAVEY DISGUST SCALE

QUESTION 6.	Please indicate how much each statement applies to you by ticking the box to the right of them which indicates the frequency with which you find yourself experiencing what is described in the statement.					
		Never	Rarely	Sometimes	Often	Always
1.	I become disgusted more easily than other people.	☐1	☐2	☐3	☐4	☐5
2.	I avoid disgusting things.	☐1	☐2	☐3	☐4	☐5
3.	When I feel disgusted my bodily sensations frighten me.	☐1	☐2	☐3	☐4	☐5
4.	When I am disgusted I feel faint.	☐1	☐2	☐3	☐4	☐5
5.	I think disgusting things could cause me illness/infection.	☐1	☐2	☐3	☐4	☐5
6.	Disgust can really take me over.	☐1	☐2	☐3	☐4	☐5
7.	I am comfortable handling things that others find disgusting.	☐1	☐2	☐3	☐4	☐5
8.	When I notice I feel nauseous, I worry about vomiting.	☐1	☐2	☐3	☐4	☐5
9.	It scares me when I salivate excessively.	☐1	☐2	☐3	☐4	☐5
10.	When I am disgusted I feel like I might be contaminated.	☐1	☐2	☐3	☐4	☐5
11.	When I feel disgusted I worry that I might pass out.	☐1	☐2	☐3	☐4	☐5
12.	I feel repulsed.	☐1	☐2	☐3	☐4	☐5
13.	When I am disgusted I feel nauseous.	☐1	☐2	☐3	☐4	☐5
14.	I experience disgust.	☐1	☐2	☐3	☐4	☐5
15.	I think feeling disgusted is bad for me.	☐1	☐2	☐3	☐4	☐5
16.	It scares me when I vomit.	☐1	☐2	☐3	☐4	☐5
17.	I worry that I might swallow a disgusting thing.	☐1	☐2	☐3	☐4	☐5
18.	Disgusting things make my skin crawl.	☐1	☐2	☐3	☐4	☐5
19.	It scares me when I feel nauseous.	☐1	☐2	☐3	☐4	☐5
20.	Disgusting things make my stomach turn.	☐1	☐2	☐3	☐4	☐5
21.	When I am disgusted I feel sweaty.	☐1	☐2	☐3	☐4	☐5
22.	When I am disgusted my stomach turns.	☐1	☐2	☐3	☐4	☐5
23.	When I feel disgusted it passes quickly.	☐1	☐2	☐3	☐4	☐5
24.	Rancid smells distress me.	☐1	☐2	☐3	☐4	☐5
25.	I find it easy to ignore my feelings of disgust.	☐1	☐2	☐3	☐4	☐5
26.	I screw up my face with disgust.	☐1	☐2	☐3	☐4	☐5
27.	I cannot think clearly when I am disgusted.	☐1	☐2	☐3	☐4	☐5
28.	I find something disgusting.	☐1	☐2	☐3	☐4	☐5
29.	I worry that I might harm myself trying to avoid something disgusting.	☐1	☐2	☐3	☐4	☐5
30.	It scares me when I feel faint.	☐1	☐2	☐3	☐4	☐5
31.	When I experience disgust it is an intense feeling.	☐1	☐2	☐3	☐4	☐5
32.	It embarrasses me when I feel disgusted	☐1	☐2	☐3	☐4	☐5

Appendix 7: APPEARANCE SCHEMA INVENTORY – REVISED SCALE

QUESTION 2.	The following statements are beliefs that people may or may not have about their physical appearance and its influence on life. Decide on the extent to which you agree or disagree with each statement and circle the corresponding number to the right of the item.					
		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1.	I spend little time on my physical appearance.	1	2	3	4	5
2.	When I see good-looking people, I wonder how my own looks measure up.	1	2	3	4	5
3.	I try to be as physically attractive as I can be.	1	2	3	4	5
4.	I have never paid much attention to what I look like.	1	2	3	4	5
5.	I seldom compare my appearance to that of other people I see.	1	2	3	4	5
6.	I often check my appearance in a mirror just to check I look okay	1	2	3	4	5
7.	When something makes me feel good or bad about my looks I tend to dwell on it.	1	2	3	4	5
8.	If I like how I look on a given day, it's easy to feel happy about other things.	1	2	3	4	5
9.	If somebody had a negative reaction to what I look like it wouldn't bother me.	1	2	3	4	5
10.	When it comes to physical appearance, I have high standards.	1	2	3	4	5
11.	My physical appearance has had little influence on my life.	1	2	3	4	5
12.	Dressing well is not a priority for me.	1	2	3	4	5
13.	When I meet people for the first time, I wonder what they think about how I look.	1	2	3	4	5
14.	In my everyday life, lots of things happen that make me think about what I look like.	1	2	3	4	5
15.	If I dislike how I look on a given day, it's hard to be happy about other things.	1	2	3	4	5
16.	I fantasise about what it would be like to look better than I am	1	2	3	4	5
17.	Before going out, I make sure that I look as good as I possibly can.	1	2	3	4	5
18.	What I look like is an important part of who I am.	1	2	3	4	5
19.	By controlling my appearance, I can control many of the social and emotional events in my life.	1	2	3	4	5
20.	My appearance is responsible for much of what has happened to me in my life.	1	2	3	4	5

Appendix 8: OTHER AS SHAMER SCALE

QUESTION 5.	Please read each statement carefully and circle the number to the right of the item that indicates the frequency with which you find yourself feeling or experiencing what is described in the statement.					
		Never	Seldom	Sometimes	Frequently	Almost Always
1	I feel other people see me as not good enough.	☐0	☐1	☐2	☐3	☐4
2	I think that other people look down on me.	☐0	☐1	☐2	☐3	☐4
3	Other people put me down a lot.	☐0	☐1	☐2	☐3	☐4
4	I feel insecure about others opinions of me.	☐0	☐1	☐2	☐3	☐4
5	Other people see me as not measuring up to them.	☐0	☐1	☐2	☐3	☐4
6	Other people see me as small and insignificant.	☐0	☐1	☐2	☐3	☐4
7	Other people see me as somehow defective as a person.	☐0	☐1	☐2	☐3	☐4
8	People see me as unimportant compared to others.	☐0	☐1	☐2	☐3	☐4
9	Other people look for my faults.	☐0	☐1	☐2	☐3	☐4
10	People see me as striving for perfection but being unable to reach my own standards.	☐0	☐1	☐2	☐3	☐4
11	I think others are able to see my defects.	☐0	☐1	☐2	☐3	☐4
12	Others are critical or punishing when I make a mistake.	☐0	☐1	☐2	☐3	☐4
13	People distance themselves from me when I make mistakes.	☐0	☐1	☐2	☐3	☐4
14	Other people always remember my mistakes.	☐0	☐1	☐2	☐3	☐4
15	Others see me as fragile.	☐0	☐1	☐2	☐3	☐4
16	Others see me as empty and unfulfilled.	☐0	☐1	☐2	☐3	☐4
17	Others think there is something missing in me.	☐0	☐1	☐2	☐3	☐4
18	Other people think I have lost control over my body and feelings.	☐0	☐1	☐2	☐3	☐4

Appendix 9: INTERNAL SHAME SCALE

ISS

Read each of the following statements carefully and circle the number to the right of them tha indicates the frequency with which you find yourself experiencing what is described in th statement.

Use the scale below:

0 = Never 1 = Seldom 2 = Sometimes 3 = Often 4 = Almost Always

16. I think others are able to see my defects.	**0 1 2 3 4**
17. I could beat myself over the head with a club when I make a mistake.	**0 1 2 3 4**
18. On the whole I am satisfied with myself.	**0 1 2 3 4**
19. I would like to shrink away when I make a mistake.	**0 1 2 3 4**
20. I replay painful events over and over in my mind until I am overwhelmed.	**0 1 2 3 4**
21. I feel I am a person of equal worth, at least on an equal plane with others.	**0 1 2 3 4**
22. At times I feel I will break into a thousand pieces.	**0 1 2 3 4**
23. I feel as if I have lost control over my body functions and feelings.	**0 1 2 3 4**
24. Sometimes I feel no bigger than a pea.	**0 1 2 3 4**
25. At times I feel so exposed that I wish the earth would open up and swallow me.	**0 1 2 3 4**
26. I have this painful gap within me that I have not been able to fill.	**0 1 2 3 4**
27. I feel empty and unfulfilled.	**0 1 2 3 4**
28. I take a positive attitude toward myself.	**0 1 2 3 4**
29. My loneliness is more like emptiness.	**0 1 2 3 4**
30. I feel like there is something missing.	**0 1 2 3 4**

Appendix 10: SKIN SHAME SCALE (SSS)

QUESTION 4.	Here is a list of statements describing feelings and experiences about your skin that you may or may not have. Many people have had these feelings at some time while others will rarely or never have had these feelings. Please try to be as honest as you can in responding to each statement.					
		Never	Rarely	Sometimes	Often	Always
1.	I've learnt to live with my skin condition	☐1	☐2	☐3	☐4	☐5
2.	I avoid looking at my skin the mirror	☐1	☐2	☐3	☐4	☐5
3.	My skin looks unattractive	☐1	☐2	☐3	☐4	☐5
4.	I avoid undressing in front of people	☐1	☐2	☐3	☐4	☐5
5.	My skin condition rules my life	☐1	☐2	☐3	☐4	☐5
6.	Others stare at my skin	☐1	☐2	☐3	☐4	☐5
7.	My skin makes me different	☐1	☐2	☐3	☐4	☐5
8.	My skin is beautiful	☐1	☐2	☐3	☐4	☐5
9.	I avoid getting treatment for my skin	☐1	☐2	☐3	☐4	☐5
10.	I am ashamed of my skin	☐1	☐2	☐3	☐4	☐5
11.	I avoid socialising because of my skin	☐1	☐2	☐3	☐4	☐5
12.	Hiding my skin makes me feel better	☐1	☐2	☐3	☐4	☐5
13.	I worry how my skin looks to others	☐1	☐2	☐3	☐4	☐5
14.	I find myself thinking about my skin	☐1	☐2	☐3	☐4	☐5
15.	I am proud of my skin	☐1	☐2	☐3	☐4	☐5
16.	I avoid discussing my skin	☐1	☐2	☐3	☐4	☐5
17.	I believe that people accept my skin	☐1	☐2	☐3	☐4	☐5
18.	I avoid intimate contact because of my skin	☐1	☐2	☐3	☐4	☐5
19.	My skin is as attractive as other people	☐1	☐2	☐3	☐4	☐5
20.	I avoid touching my skin	☐1	☐2	☐3	☐4	☐5
21.	I can control my skin condition	☐1	☐2	☐3	☐4	☐5
22.	I feel despondent about my skin	☐1	☐2	☐3	☐4	☐5
23.	I feel good when people touch my skin	☐1	☐2	☐3	☐4	☐5
24.	My skin condition is only one aspect of me	☐1	☐2	☐3	☐4	☐5

Appendix 11: HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS)

Question 3.	Read each of the following items carefully and tick the reply, which is closest to how you've been feeling in the *past week*			
1. I feel tense or 'wound up':				
Most of the time ☐ 1	A lot of the time ☐ 2	From time to time, occasionally ☐ 3	Not at all ☐ 4	
2. I still enjoy the things I used to enjoy:				
Definitely as much ☐ 1	Not quite as much ☐ 2	Only a little ☐ 3	Hardly at all ☐ 4	
3. I get a sort of frightened feeling as if something awful is about to happen:				
Very definitely and quite badly ☐ 1	Yes, but not too badly ☐ 2	A little, but it doesn't worry me ☐ 3	Not at all ☐ 4	
4. I can laugh and see the funny side of things:				
As much as I always could ☐ 1	Not quite so much now ☐ 2	Definitely not so much now ☐ 3	Not at all ☐ 4	
5. Worrying thoughts go through my mind:				
A great deal of the time ☐ 1	A lot of the time ☐ 2	From time to time but not too often ☐ 3	Only occasionally ☐ 4	
6. I feel cheerful:				
Not at all ☐ 1	Not often ☐ 2	Sometimes ☐ 3	Most of the time ☐ 4	
7. I can sit at ease and feel relaxed				
Definitely ☐ 1	Usually ☐ 2	Not often ☐ 3	Not at all ☐ 4	
8. I feel as if I am slowed down:				
Nearly all the time ☐ 1	Very often ☐ 2	Sometimes ☐ 3	Not at all ☐ 4	
9. I get a sort of frightened feeling like 'butterflies' in the stomach:				
Not at all ☐ 1	Occasionally ☐ 2	Quite often ☐ 3	Very often ☐ 4	
10. I have lost interest in my appearance:				
Definitely ☐ 1	I don't take as much care as I should ☐ 2	I may not take quite as much care ☐ 3	I take just as much care as ever ☐ 4	
11. I feel restless as if I have to be on the move:				
Very much indeed ☐ 1	Quite a lot ☐ 2	Not very much ☐ 3	Not at all ☐ 4	
12. I look forward with enjoyment to things:				
As much as I ever did ☐ 1	Rather less than I used to ☐ 2	Definitely less that I used to ☐ 3	Hardly at all ☐ 4	
13. I get sudden feelings of panic:				
Very often indeed ☐ 1	Quite often ☐ 2	Not very often ☐ 3	Not at all ☐ 4	
14. I can enjoy a good book or radio or TV program:				
Often ☐ 1	Sometimes ☐ 2	Not often ☐ 3	Very seldom ☐ 4	

Appendix 12: DERMATOLOGY LIFE QUALITY INVENTORY (DLQI)

1.	The aim of this questionnaire is to measure how much your skin problem has affected your life **OVER THE LAST WEEK.**

1. Over the last week, how **itchy**, **sore**, **painful** or **stinging** has your skin been?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4

2. Over the last week, how **embarrassed** or **self conscious** have you been because of your skin?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4

3. Over the last week, how much has your skin interfered with you going **shopping** or looking after your **home** or **garden**?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4

4. Over the last week, how much has your skin influenced the **clothes** you wear?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4

5. Over the last week, how much has your skin affected any **social** or **leisure** activities?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4

6. Over the last week, how much has your skin made it difficult for you to do any **sport**?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4	N/A	☐ 5

7. Over the last week, has your skin prevented you from **working** or **studying**?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4	N/A	☐ 5

8. Over the last week, how much has your skin created problems with your **partner** or any of your **close friends** or **relatives**?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4	N/A	☐ 5

9. Over the last week, how much has your skin caused any **sexual difficulties**?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4	N/A	☐ 5

10. Over the last week, how much of a problem has the **treatment** for your skin been, for example by making your home messy, or by taking up time?

Very much	☐ 1	A lot	☐ 2	A little	☐ 3	Not at all	☐ 4

Appendix 13: INTERNAL AND EXTERNAL MOTIVATION SCALE

QUESTION 7.	The following questions concern various reasons or motivations people might have for trying to respond in non-prejudiced ways toward people with a disfigurement. We are simply trying to get an idea of the types of motivations that people in general have for responding in non-prejudiced ways. If we are to learn anything useful, it is important that you respond to each of the questions openly and honestly.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Because of today's PC (politically correct) standards I try to appear non-prejudiced toward people with a skin condition.	☐1	☐2	☐3	☐4	☐5
2. I attempt to act in non-prejudiced ways towards people with a skin condition because it is personally important to me.	☐1	☐2	☐3	☐4	☐5
3. I try to hide any negative thoughts about people with skin conditions in order to avoid negative reactions from others.	☐1	☐2	☐3	☐4	☐5
4. If I acted prejudiced towards people with skin conditions, I would be concerned that others would be angry with me.	☐1	☐2	☐3	☐4	☐5
5. According to my personal values, using stereotypes about people with skin conditions is OK.	☐1	☐2	☐3	☐4	☐5
6. I am personally motivated by my beliefs to be non-prejudiced toward people with skin conditions.	☐1	☐2	☐3	☐4	☐5
7. I attempt to appear non-prejudiced toward people with skin conditions in order to avoid disapproval from others.	☐1	☐2	☐3	☐4	☐5
8. Because of my personal values, I believe that using stereotypes about people with skin conditions is wrong.	☐1	☐2	☐3	☐4	☐5
9. I try to act non-prejudiced toward people with skin conditions because of pressure from others.	☐1	☐2	☐3	☐4	☐5
10. Being non-prejudiced toward people with skin conditions is important to my self-concept.	☐1	☐2	☐3	☐4	☐5

Appendix 14: THERMOMETER AND SEMANTIC DIFFERENTIAL

On a scale of 1 to 9 (see below) how warm do you feel towards people with a skin condition e.g. acne, eczema, psoriasis? (Please circle the number that is closest to how you feel).

1	2	3	4	5	6	7	8	9
Very Cold				Neutral				Very Warm

Please indicate on the scales below where you feel people with **skin conditions** (as a group) fall. There are no right or wrong answers.

1. Bad/Good

Please circle the number on the scale below, which corresponds to where you think people with skin conditions fall:

1	2	3	4	5	6	7
Bad			Neutral			Good

2. Unpleasant/Pleasant

Please circle the number on the scale below, which corresponds to where you think people with skin conditions fall:

1	2	3	4	5	6	7
Unpleasant			Neutral			Pleasant

3. Ugly/Beautiful

Please circle the number on the scale below, which corresponds to where you think people with skin conditions fall:

1	2	3	4	5	6	7
Ugly			Neutral			Beautiful

4. Foolish/Wise

Please circle the number on the scale below, which corresponds to where you think people with skin conditions fall:

1	2	3	4	5	6	7
Foolish			Neutral			Wise

5.Awful/Nice

Please circle the number on the scale below, which corresponds to where you think people with skin conditions fall:

1	2	3	4	5	6	7
Awful			Neutral			Nice

On a scale of 1 to 9 (see below) how warm do you feel towards people without a skin condition? (Please circle the number that is closest to how you feel).

1	2	3	4	5	6	7	8	9
Very Cold				Neutral				Very Warm

Please indicate on the scales below where you feel people with **clear skin** (as a group) fall. There are no right or wrong answers.

1. Bad/Good
Please circle the number on the scale below, which corresponds to where you think people with clear skin fall:

1	2	3	4	5	6	7
Bad			Neutral			Good

2. Unpleasant/Pleasant
Please circle the number on the scale below, which corresponds to where you think people with clear skin fall:

1	2	3	4	5	6	7
Unpleasant			Neutral			Pleasant

3. Ugly/Beautiful
Please circle the number on the scale below, which corresponds to where you think people with clear skin fall:

1	2	3	4	5	6	7
Ugly			Neutral			Beautiful

4. Foolish/Wise
Please circle the number on the scale below, which corresponds to where you think people with clear skin fall:

1	2	3	4	5	6	7
Foolish			Neutral			Wise

5.Awful/Nice
Please circle the number on the scale below, which corresponds to where you think people with clear skin fall:

1	2	3	4	5	6	7
Awful			Neutral			Nice

Appendix 15: DEMOGRAPHIC VARIABLES

Demographic Questions.

Age: Sex: Nationality: Ethnicity

Have you ever suffered from a skin condition?

Which?

How long did/does it last?

Do/did you receive treatment for it?

What symptoms did you experience?

Does anyone close to you suffer from a skin condition?

Has anyone close to you ever suffered from a skin condition?

Which?

How long did/does it last?

Do/did they receive treatment for it?

What symptoms did they experience?

What about people you come into regular contact with?

Is there anything else you would like to add?

Appendix 16: SCALE TO RATE PICTURE GROUPS

This is an example of the questionnaires that the participants filled in, they were given both headings with a full list of the pictures beneath. This is for example purposes only.

Using the scale below please circle the response, which most accurately assesses how you would describe the condition of the skin of the person in the picture.

Very Severe	Severe	Moderate	Mild	Clear skin

Using the scale below please circle the response which most accurately assesses how attractive you feel the person in the picture is.

	Very Unattractive	Unattractive	Neither Attractive nor Unattractive	Attractive	Very Attractive
Picture 1	1	2	3	4	5
Picture 2	1	2	3	4	5
Picture 3	1	2	3	4	5
Picture 4	1	2	3	4	5
Picture 5	1	2	3	4	5
Picture 6	1	2	3	4	5
Picture 7	1	2	3	4	5
Picture 8	1	2	3	4	5
Picture 9	1	2	3	4	5
Picture 10	1	2	3	4	5
Picture 11	1	2	3	4	5
Picture 12	1	2	3	4	5

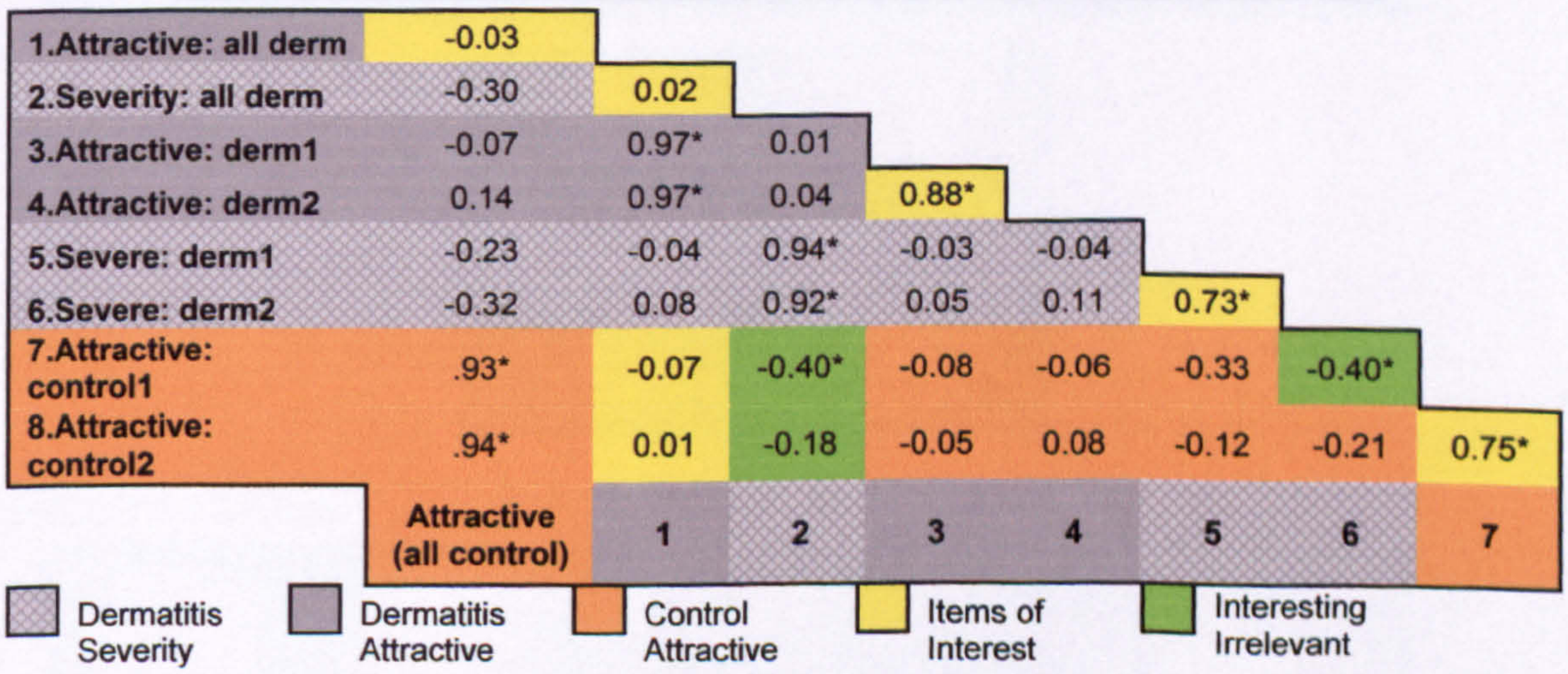
Etc...

Appendix 17: RATINGS FOR PICTURE GROUPS

Severity and Attractiveness; Differences Between Picture Pairs.

	Skin Conditions				Clear Skin	
	Severity	sd	Attractiveness	sd	Attractiveness	sd
Group 1	3.42	0.89	2.03	0.91	2.20	0.70
Group 2	3.45	0.92	2.53	0.83	2.26	0.70
Difference	0.03	0.03	0.50	-0.09	0.06	0.00
Group 1	3.37	0.75	2.74	0.89	2.30	0.80
Group 2	3.34	1.05	2.32	0.81	2.30	0.90
Difference	0.03	-0.30	0.42	0.08	0.00	0.10
Group 1	3.26	0.92	2.39	0.82	2.37	0.80
Group 2	3.29	0.77	2.45	0.76	2.40	0.70
Difference	0.03	-0.15	0.05	-0.06	0.03	-0.10
Group 1	3.05	0.80	2.05	0.66	2.40	0.80
Group 2	3.05	0.73	2.34	0.71	2.43	0.90
Difference	0.00	-0.07	0.29	0.05	0.03	0.10
Group 1	2.92	0.82	2.34	0.91	2.73	0.70
Group 2	2.95	0.80	2.42	0.76	2.83	0.90
Difference	0.03	-0.01	0.08	-0.15	0.10	0.20
Group 1	2.58	0.92	1.79	0.66	3.13	0.80
Group 2	2.61	0.97	1.87	0.81	3.13	0.90
Difference	0.03	0.05	0.08	0.15	0.00	0.10
Group 1	2.45	0.76	2.11	0.80	3.63	0.70
Group 2	2.53	0.76	2.05	0.77	3.63	0.70
Difference	0.08	0.00	-0.05	-0.03	0.00	0.00

Correlations Between Measures



T-tests were also not significant (p>0.62 for all measures)

Appendix 18: LIST OF SKIN CONDITIONS

Group	Skin Condition
1	Lupus Pernio Besnier
1	Dermatomyositis
1	Facial Granuloma With Eosinophilia
1	Pemphigus Seborrhoicus
1	Sweets Syndrome
1	Rosacea
1	Discoid Lupus Erythematosus (DLE)
2	Progressive Systemic Scleroderma
2	Stevens-Johnson Syndrome
2	Corticoid Damage
2	Subacute Cutaneous Lupus
2	Dermatomyositis
2	Dyskeratosis Follicularis
2	Photoallergic Contact Dermatitis
3	Corticoid Damage
3	Discoid Lupus Erythematosus (DLE)
3	Allergic Contact Dermatitis, Acute & Chronic
3	Demodicidiosis And Rosacea
3	Chloasma Medicamentosum

Appendix 19: PICTURES OF PEOPLE WITH SKIN CONDITION

Group 1 – IAT/Psychophysiology:

Group 2 - IAT/Psychophysiology:

Group 3 - Recall:

Appendix 20: PICTURES OF PEOPLE WITH CLEAR SKIN

Group 1 – IAT/Psychophysiology:

Group 2 - IAT/Psychophysiology:

Group 3 - Recall:

Appendix 21: IAT INSTRUCTIONS

Initial Instructions:

In this task, you will be pairing words and pictures with a category. You will be categorizing target words as either being "pleasant" or "unpleasant" and target pictures as being "clear skin" or "skin condition".

Within this experiment you will see pictures of peoples' faces with skin conditions, (these are referred to as "skin condition") and pictures of people without a skin condition (these are referred to as "clear skin"). Skin conditions can refer to a range of skin conditions including eczema, acne, etc.

Also you will be asked to classify words, for example, you will see the word "vomit" and have to classify it as either pleasant or unpleasant.

If you make a mistake a red 'X' will appear, when you press the correct key it will go! In each task, you will see each word and picture more than once. Do not worry. Just continue with the task.

Press the 'Space Bar' to continue

Before Task Begins

For this part of the experiment, you will be classifying target pictures as either clear skin or skin condition. By this we mean that you will be seeing pictures that have a skin condition (e.g. eczema, acne) these pictures should be classified as 'skin condition' and the pictures where the person doesn't have a skin condition should be classified as 'clear skin'.

For each trial, a target picture will appear in the centre of the screen.

If the target picture has clear skin press 'E'.

If the target picture has a skin condition press 'I'.

Again, this classification task should be very simple - you should not make any mistakes. In addition, you should respond as fast as you can. However, keep in mind that you should respond quickly, but also be error-free in your responses.

The words "clear skin" and "skin condition" are on the screen as a reminder to press the key on the left ('e') for a person with clear skin, and the key on the right ('i') for a person with a skin condition.

If you have any questions, please ask the experimenter.

If not, you may press the 'Space Bar' to begin.

After 1st Phase

You may now take a few seconds to rest your eyes. When you are ready, please read the instructions on this screen.

For this part of the experiment, you will be classifying concepts as either pleasant or unpleasant. For each trial, a target word will appear in the centre of the screen.

If the target word is a pleasant word press 'E'.

If the target word is an unpleasant word press 'I'.

This classification task should be very simple - you should not make any mistakes.

In addition, you should respond as fast as you can. However, keep in mind that you should respond quickly, but also be error-free in your responses.

The words "pleasant" and "unpleasant" are on the screen as a reminder to press the key on the left ('e') for a pleasant word, and the key on the right ('i') for an unpleasant word.

If you have any questions, please call the experimenter.

If not, you may press the 'Space Bar' to begin.

After 2nd Phase

You may now take a few seconds to rest your eyes. When you are ready, please read the instructions on this screen.

For the next part of the experiment, you will be combining the classifying of concepts that you did on the first two tasks. For each trial, a target word will appear in the centre of the screen.

If the target is a picture of someone with clear skin OR a pleasant word press 'E'.

If the target is a picture of someone who has a skin condition OR an unpleasant word press 'I'.

This classification task may be more complicated than the first two tasks, but you still should not make any mistakes. You should respond as fast as you can, keeping in mind that you should also be error-free in your responses.

The words "pleasant" "clear skin" and "unpleasant" "skin condition" are on the screen as a reminder to press the key on the left ('e') for a pleasant word OR a picture of someone with clear skin and the key on the right ('i') for a picture of someone with a skin condition OR an unpleasant word.

If you have any questions, please ask the experimenter.

If not, you may press the 'Space Bar' to begin.

After 3rd Phase

You may now take a few seconds to rest your eyes. When you are ready, please read the instructions on this screen.

For this part of the experiment, you will be reclassifying pictures as either a "skin condition" or "clear skin". This time, the classification will be reversed from the original task.

If the target picture has a skin condition press 'E'.

If the target picture has clear skin press 'I'.

Again, this classification task should be very simple - you should not make any mistakes. In addition, you should respond as fast as you can. Keep in mind that you should respond quickly, but also be error-free in your responses.

The words "skin condition" and "clear skin" are on the screen as a reminder to press the key on the left ('e') for a person with a skin condition, and the key on the right ('i') for a person without a skin condition.

If you have any questions, please ask the experimenter. If not, you may press the 'Space Bar' to begin.

After 4th Phase

You may now take a few seconds to rest your eyes. When you are ready, please read the instructions on this screen.

The next part of the experiment will be another combined classification task, using the new categorization of skin condition or clear skin you just practiced.

If the target word is a picture of someone with a skin condition OR a pleasant word press 'E'.

If the target word is a picture of someone with clear skin OR an unpleasant word press 'I'.

This classification task may be more complicated than the simpler tasks, but you still should not make any mistakes. You should respond as fast as you can, keeping in mind that you should also be error-free in your responses.

The words "pleasant" "skin condition" "unpleasant" and "clear skin" are on the screen as a reminder to press the key on the left ('e') for a picture of someone with a skin condition OR a pleasant word, and the button on the right ('i') for a picture of someone with clear skin OR an unpleasant word.

If you have any questions, please ask the experimenter.

If not, you may press the 'Space Bar' to begin.

Final Instructions

You have now finished this part of the experiment.

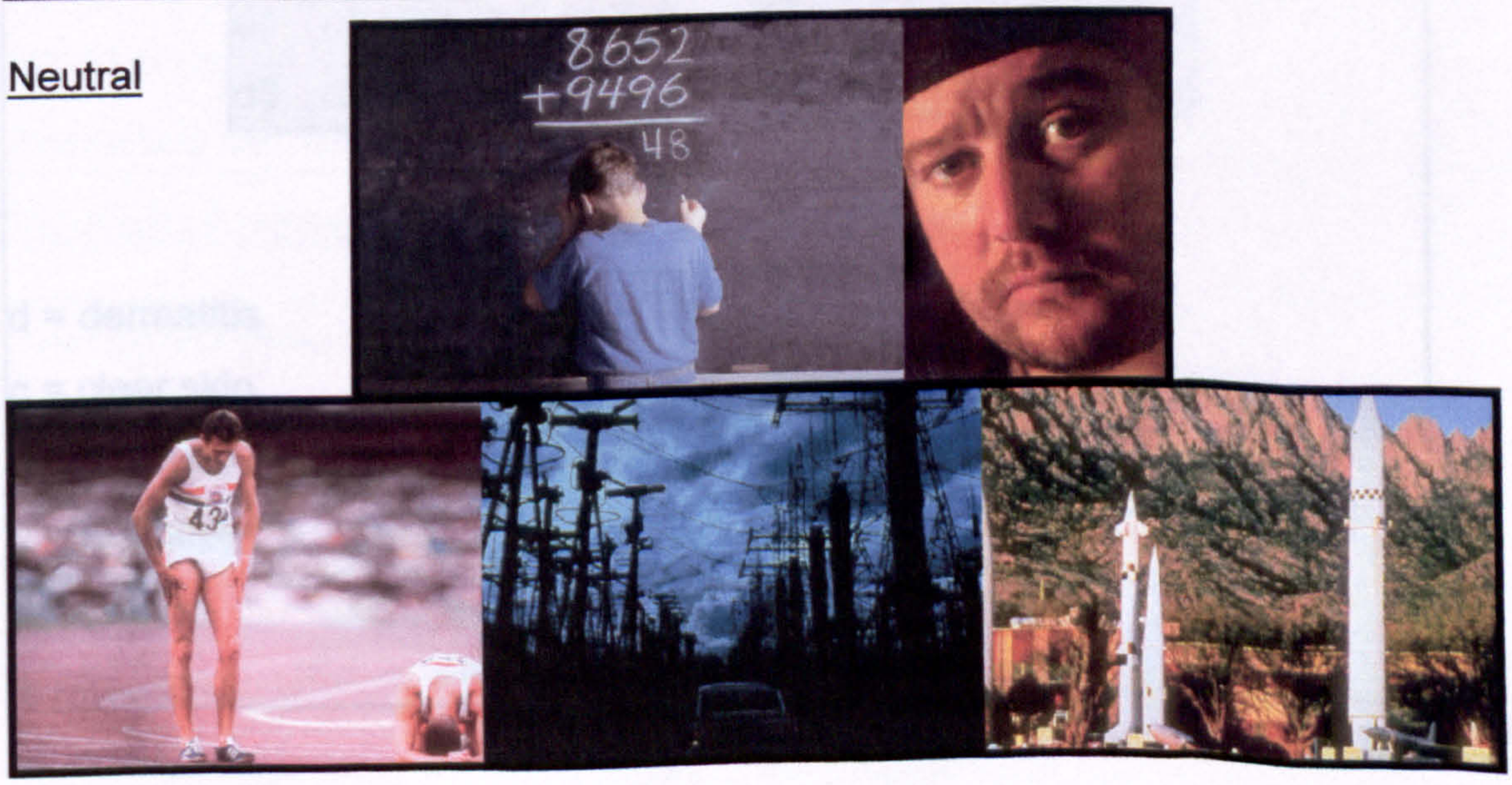
Please call the experimenter.

Appendix 22: IAPS STIMULI

Pleasant

Unpleasant

Neutral



Appendix 23: IAPS NUMBERS OF STIMULI

Neutral	Positive	Negative
2230	3130	4607
2410	3150	4660
6930	6312	5621
8010	9410	8080
9080	9800	8370

Appendix 24: BLOCKS OF PICTURES WITHIN PSYCHOPHYSIOLOGY

Block 1

d1	c1	p1	n1	o1
d2	c2	p2	n2	o2
d3	c3	p3	n3	o3
d4	c4	p4	n4	o4
d5	c5	p5	n5	o5

Block 2

d1	c2	p3	n4	o5
d2	c3	p4	n5	o1
d3	c4	p5	n1	o2
d4	c5	p1	n2	o3
d5	c1	p2	n3	o4

Block 3

d1	c3	p5	n2	o4
d2	c4	p1	n3	o5
d3	c5	p2	n4	o1
d4	c1	p3	n5	o2
d5	c2	p4	n1	o3

Block 4

d1	c5	p4	n3	o2
d2	c1	p5	n4	o3
d3	c2	p1	n5	o4
d4	c3	p2	n1	o5
d5	c4	p3	n2	o1

Block 5

d1	c4	p2	n5	o3
d2	c5	p3	n1	o4
d3	c1	p4	n2	o5
d4	c2	p5	n3	o1
d5	c3	p1	n4	o2

d = dermatitis
c = clear skin
p = positive
n = negative
o = neutral

Appendix 25: PSYCHOPHYSIOLOGY INSTRUCTIONS

Initial instructions

Thank you for agreeing to take part in this study!

This experiment begins with an asterisk in the centre of the screen together with the sound of a bleep, to act as a fixation point.

It is important that you focus on this fixation point EVERY time it is presented on the screen.

The fixation point will be replaced by a picture and your task is to silently look at each picture until it disappears from the screen.

After a period of time, you will see the fixation point again, followed by a new picture and once again you must silently look at the picture that appears. This sequence will continue for a number of trials.

At the end of the experiment you will be shown the pictures again intermixed with new pictures, you will be asked to say which pictures you have already seen. Therefore it is important that you look at each picture carefully.

PLEASE NOTE - THROUGHOUT THE COMPUTER TASK PLEASE TRY NOT TO MOVE AROUND!

Second Set of Instructions

Before we begin the trials, the screen will remain blank for a few minutes and you must simply sit as still as possible and relax until the trials begin.

Please remember not to move around during the relaxation period and the main computer task.

Thank you and relax!

Third set of instructions (just before pictures appear)

The task is about to begin.

Remember to remain as still as possible throughout the task and to silently look at each picture on the screen. Please wait.

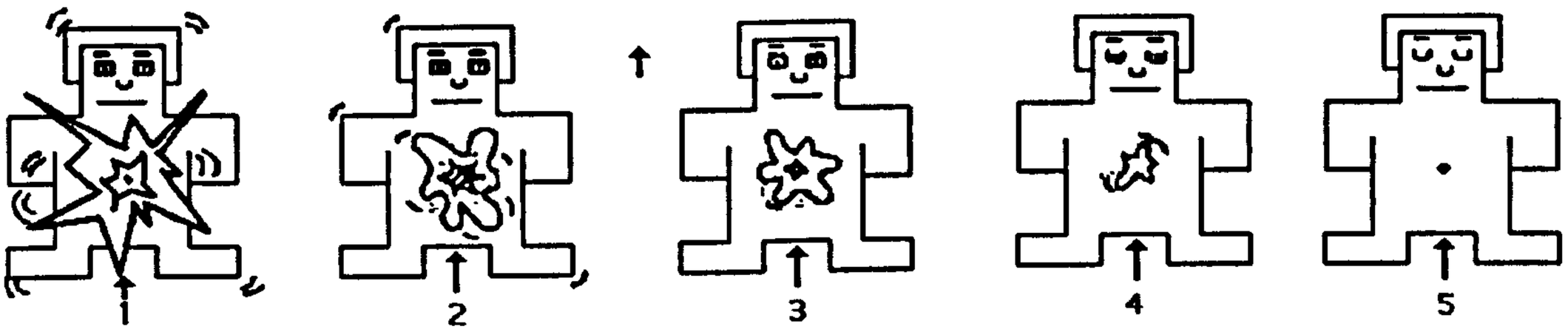
Final Instructions

Thank you - the computer task has now finished. Please wait for the experimenter.

Appendix 26: SELF ASSESSMENT MANNEQUIN

Aroused Mannequin (Arrangement 1)

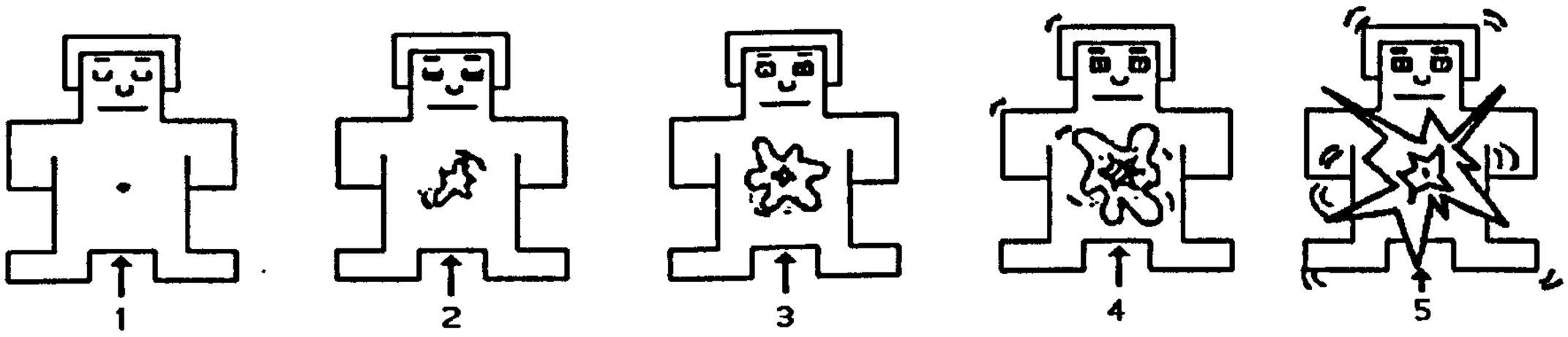
Arousing



Calm

Aroused Mannequin (Arrangement 2)

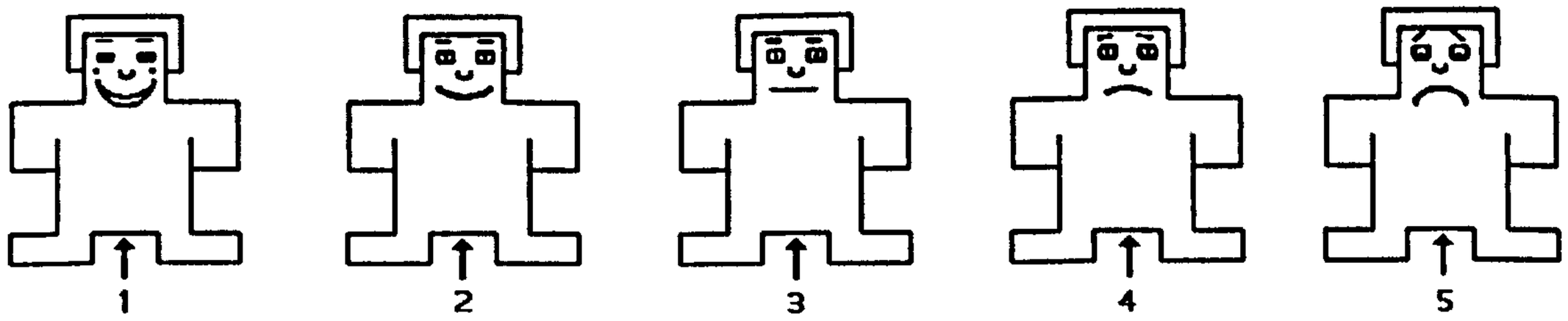
Calm



Arousing

Happy Mannequin (Arrangement 1)

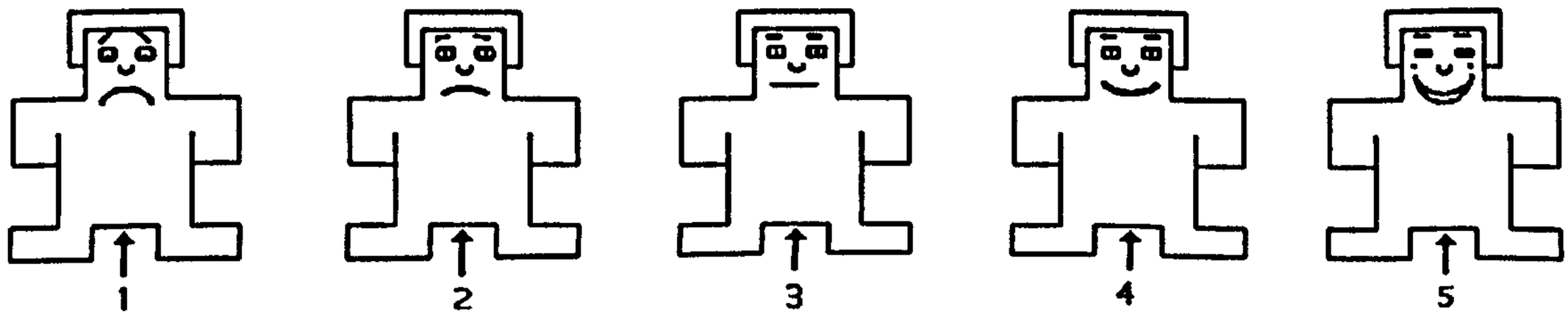
Pleasant



Unpleasant

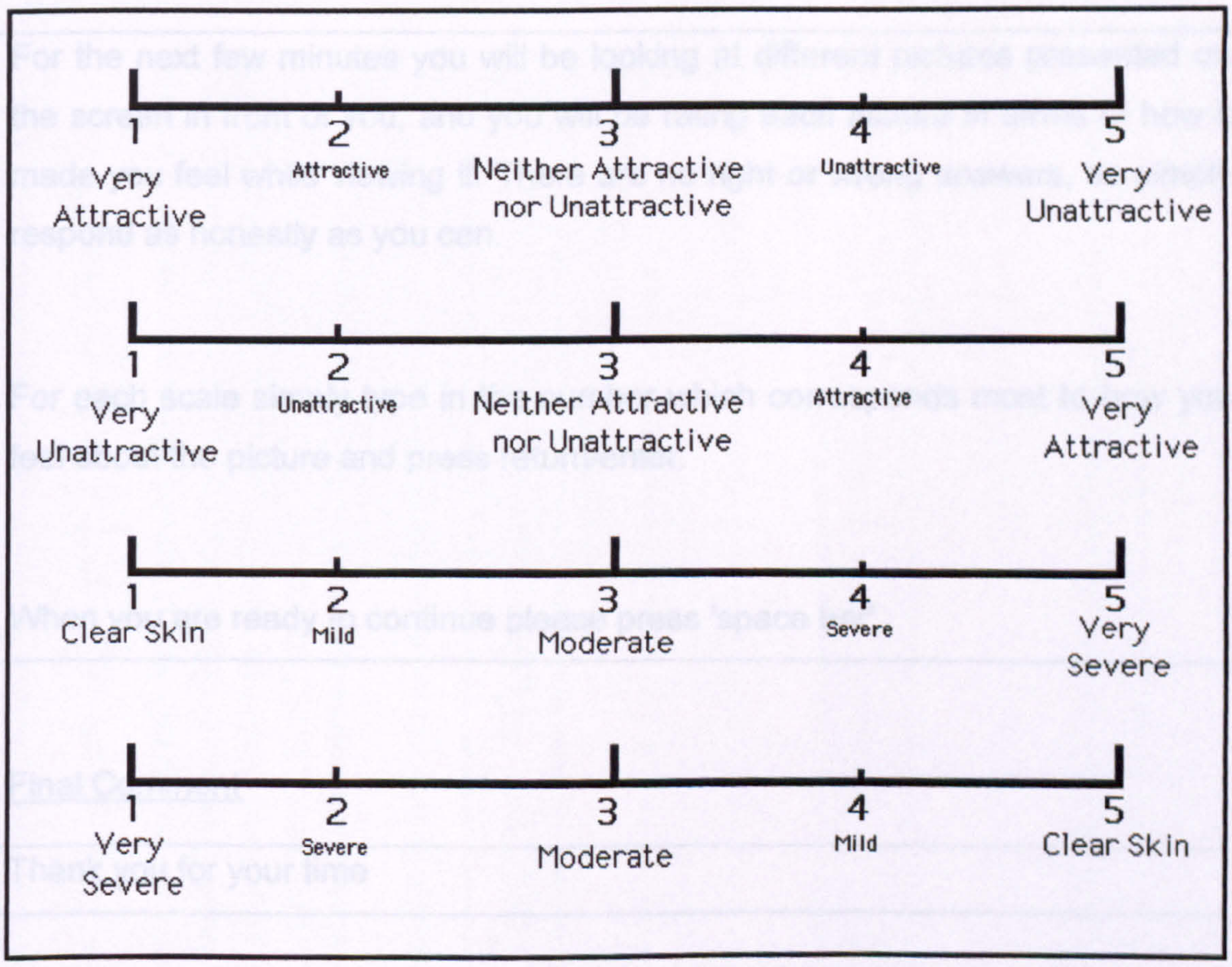
Happy Mannequin (Arrangement 2)

Unpleasant

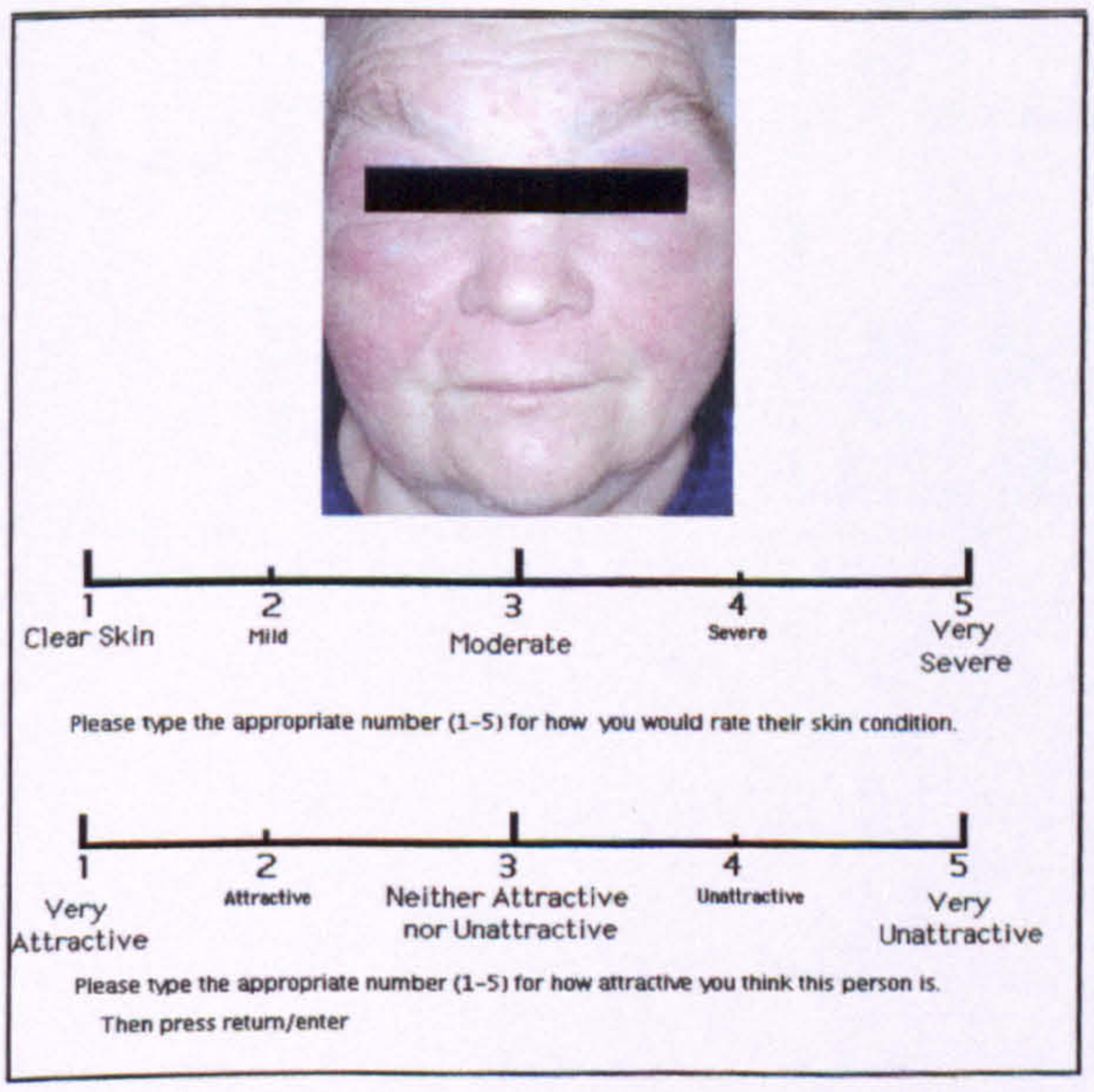


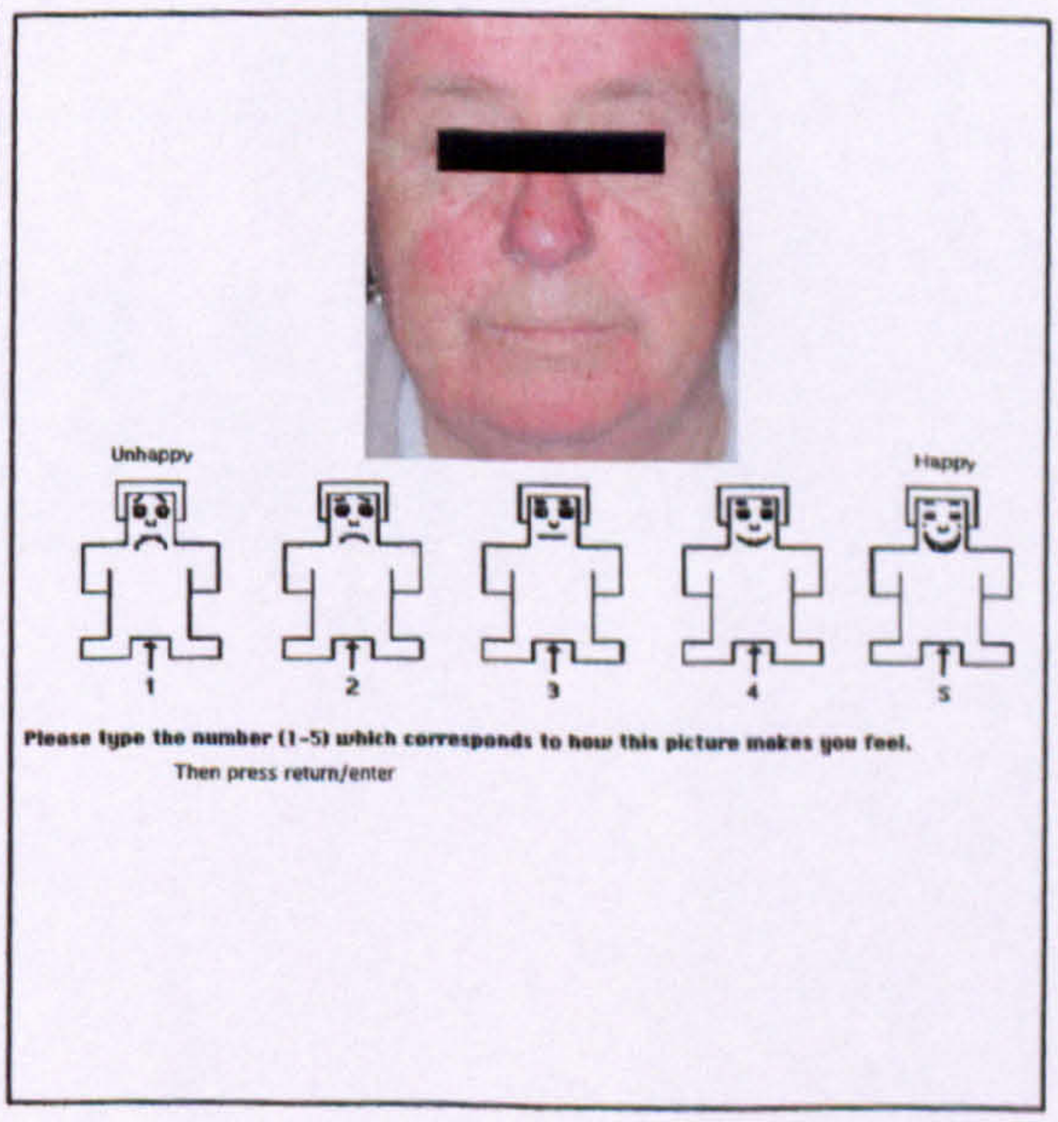
Pleasant

Appendix 27: SCALES; ATTRACTIVENESS & SEVERITY & SCREENSHOTS



Screenshots





Appendix 28: SAM INSTRUCTIONS

Initial Instructions

For the next few minutes you will be looking at different pictures presented on the screen in front of you, and you will be rating each picture in terms of how it made you feel while viewing it. There are no right or wrong answers, so simply respond as honestly as you can.

For each scale simply type in the number which corresponds most to how you feel about the picture and press return/enter.

When you are ready to continue please press 'space bar'

Final Comment

Thank you for your time

Earn £5 or 4 stickers

What happens when you look at pictures? What information are you processing, how is your body responding? This research is looking for those answers. This study will take about one hour and requires you to complete 2 computer tasks and some questionnaires.

Also some psychophysiological measures such as heart rate will be taken.

Please put E-mail address in the relevant time

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9.30					
11.00					
12.30					
14.00					
15.30					
17.00					

My E-mail address is T.Grandfield@sheffield.ac.uk and phone number is 26641

Appendix 30: COUNTERBALANCE SHEET

Condition	**Psychophysiology**			**Implicit Association Test**		
Participant	Task Order	Set (photos)	Order	Task Order	Set	Order
1	First	Set 1	1	Second	Set 2	Congruent
2	First	Set 1	1	Second	Set 2	Incongruent
3	First	Set 1	2	Second	Set 2	Congruent
4	First	Set 1	2	Second	Set 2	Incongruent
5	First	Set 1	3	Second	Set 2	Congruent
6	First	Set 1	3	Second	Set 2	Incongruent
7	First	Set 1	4	Second	Set 2	Congruent
8	First	Set 1	4	Second	Set 2	Incongruent
9	First	Set 1	5	Second	Set 2	Congruent
10	First	Set 1	5	Second	Set 2	Incongruent
11	First	Set 2	1	Second	Set1	Congruent
12	First	Set 2	1	Second	Set1	Incongruent
13	First	Set 2	2	Second	Set1	Congruent
14	First	Set 2	2	Second	Set1	Incongruent
15	First	Set 2	3	Second	Set1	Congruent
16	First	Set 2	3	Second	Set1	Incongruent
17	First	Set 2	4	Second	Set1	Congruent
18	First	Set 2	4	Second	Set1	Incongruent
19	First	Set 2	5	Second	Set1	Congruent
20	First	Set 2	5	Second	Set1	Incongruent
21	Second	Set 1	1	First	Set 2	Congruent
22	Second	Set 1	1	First	Set 2	Incongruent
23	Second	Set 1	2	First	Set 2	Congruent
24	Second	Set 1	2	First	Set 2	Incongruent
25	Second	Set 1	3	First	Set 2	Congruent
26	Second	Set 1	3	First	Set 2	Incongruent
27	Second	Set 1	4	First	Set 2	Congruent
28	Second	Set 1	4	First	Set 2	Incongruent
29	Second	Set 1	5	First	Set 2	Congruent
30	Second	Set 1	5	First	Set 2	Incongruent
31	Second	Set 2	1	First	Set1	Congruent
32	Second	Set 2	1	First	Set1	Incongruent
33	Second	Set 2	2	First	Set1	Congruent
34	Second	Set 2	2	First	Set1	Incongruent
35	Second	Set 2	3	First	Set1	Congruent
36	Second	Set 2	3	First	Set1	Incongruent
37	Second	Set 2	4	First	Set1	Congruent
38	Second	Set 2	4	First	Set1	Incongruent
39	Second	Set 2	5	First	Set1	Congruent
40	Second	Set 2	5	First	Set1	Incongruent

Appendix 31: POST HOC POWER ANALYSES

Study 1

This is calculated within Gpower putting in the means for each of the groups (n=4) (know and suffer) for the IAT. The effect size is .46. This is a medium effect.

Study 2

The interaction between knowledge and type of IAT had a low effect size, (f=.01). Therefore the power for t-tests was ascertained within Gpower looking at type of IAT and the knowledge. Type of IAT had a medium effect size (d=.47), knowledge, the effect size for this was very small (d=.016)

Study 3

The interaction between type of IAT and gender was medium (=.56), this was calculated using Gpower.

Study 4

Gpower was used to ascertain the effect size of an independent t-test for the IAT and group. This was large (d=1.42).

Appendix 32: MALE PICTURES

Group 1 – Skin Conditions:

Skin conditions suffered:

Seborrheic Dermatitis, Rosacea, Discoid Lupus Erythematosus (DLE), Sturge-Weber Syndrome, Pseudoporphyria Uraemica, Rhinophyma, Acne Papulopustulosa

Group 2 - Controls:

T-test indicated groups were not significantly different (t(12)=-1.76, p=.84)

Appendix 33: Email Sent to Potential Control Participants

Request to help in a psychological study

Are you interested in assisting in a study exploring reactions to appearance.

We need to recruit people aged between 18 & 90 to take part in a study lasting approximately 90 minutes. If you agreed to participate you would be asked to complete questionnaires, a set of simple computer tasks, and a task in which you view pictures whilst your heart rate, skin conductivity and muscle movements are recorded.

In order to reimburse you for your assistance £10.00 is available. Hot drinks and chocolate biscuits will also be available during the study.

The research is taking part over the next 4 months and appointments can be arranged at a time that will be convenient for you.

This study is part of a clinical investigation which has received ethical approval from NHS LREC and is supported by a grant from the ESRC in collaboration with the charity Changing Faces.

If you're interested in taking part or finding out more, please send an E-mail to:

Tracey Grandfield at T.Grandfield@shef.ac.uk

Appendix 34: Second E-mail Sent (Example)

Hi xxx,

Thanks for replying. Just a few more details about the study, the study is taking place in the psychology department on Western bank (this is next to the museum on Western Bank or no.34 on the campus map: http://www.shef.ac.uk/maps/university.html. I think this is just up the road from you.
This study is a control group for a clinical sample I am also collecting and I am hoping to match ages and gender. I have attached the information sheet that the patients get so that you have a better idea of the study.
I am fairly flexible regarding times (am prepared to do evening and weekend slots) - though these will be over a period of time until February, so if you have a preference to come sooner rather than later please let me know.

If you're still interested in taking part could you send a rough idea of your availability and your age?

Thanks

Tracey