PHYSIOLOGICAL, EXPERIENTIAL, & COGNITIVE CONSEQUENCES OF SUPPRESSION, REAPPRAISAL, & ACCEPTANCE DURING EMOTIONAL AROUSAL: A COMPARATIVE ANALYSIS

A thesis presented in partial fulfilment of the requirements for the degree of Master of Arts in Psychology at Massey University

Sarah Malthus

2006
Abstract

This study investigated the experiential, physiological, and memory effects of three emotion regulation strategies: acceptance, suppression, and reappraisal. Eighty female university students were exposed to a two minute standardised film designed to evoke feelings of sadness, while under instructions to either (a) push away emotions that arose (suppression), (b) view the film in an objective detached way (reappraisal), (c) accept emotions that arose without judgement (acceptance), or (d) simply watch the film (control group). Participants rated the intensity of emotions experienced both prior to and during the film. Heart rate and skin conductance were measured prior to, during, and following the film, and participants' incidental recognition memory (visual and verbal) and subjective confidence in memory were assessed post film. No significant differences were found between the mean scores of the four instructional conditions for any of the main dependent variables (possibilities regarding why this was so are discussed in this thesis). However, analysis of mean and effect size revealed trends that were supportive of several hypotheses. None of the emotion regulation strategies were found to be effective for alleviating either physiological or subjective responses to the film. However, reappraisal and acceptance participants did rate the emotive stimulus as more positive/pleasant than control participants. Clear differences also emerged with respect to incidental verbal recognition memory. Acceptance participants were the only group to achieve higher scores than control participants on this measure. These findings suggest different emotion regulation strategies may have different adaptive consequences depending on their emphasis on emotional control.
# Table of Contents

Abstract ............................................................................................... ii
Table of Contents ................................................................................ iii
List of Tables ...................................................................................... vii
Acknowledgements ............................................................................. viii
Preface ............................................................................................... ix

Introduction .......................................................................................... 1
*The Nature of Emotion and Emotion Regulation* ........................................ 1
*Adaptive versus Maladaptive Emotion Regulation* .................................... 4
  Experiential avoidance ......................................................................... 5
*Suppression: Adaptive or Maladaptive?* .................................................. 8
  Suppression: Physiological effects ...................................................... 9
  Suppression: Experiential effects ....................................................... 15
  Suppression: Cognitive effects ......................................................... 17
  Summary of suppression findings ....................................................... 20
*Are all Emotion Regulation Strategies Created Equal?* .............................. 20
*Reappraisal: Adaptive or Maladaptive?* .................................................. 22
  Summary of reappraisal findings ....................................................... 24
*The Alternative to Avoidance and Control: Acceptance-based Strategies* .... 26
  Acceptance versus avoidance based strategies: Empirical findings ............. 28
  Summary of acceptance findings ....................................................... 31
*The Present Study* ............................................................................. 33
  Conceptualisation of key constructs and rationale for use .......................... 34
*Hypotheses* .......................................................................................... 36
  Suppression ....................................................................................... 36
  Reappraisal ...................................................................................... 37
  Acceptance ...................................................................................... 37
Subjective Memory Data .................................................................68
Manipulation Checks ........................................................................69
Effect Sizes & Power ........................................................................69

Results ..........................................................................................72
Sample Characteristics .....................................................................72
Subjective Emotion ..........................................................................73
Physiological Responses .................................................................77
  Instructional period ........................................................................77
  Film & post-film periods ................................................................78
Objective Memory .............................................................................80
Subjective Memory ..........................................................................82
Manipulation Checks ........................................................................84
  Usefulness of pre-film instructions ................................................84
  Ability to follow pre-film instructions ..........................................84
  Compliance with pre-film instructions .......................................85
  Engagement with the film ..........................................................86
Health status ....................................................................................86
Power to Detect Effects .....................................................................87

Discussion .......................................................................................89
Suppression .......................................................................................90
  Physiological effects ...................................................................90
  Experiential effects .....................................................................91
  Memory effects ..........................................................................92
Reappraisal .......................................................................................94
  Experiential and physiological effects .......................................95
  Memory effects ..........................................................................96
Acceptance .......................................................................................97
  Physiological effects ...................................................................98
  Experiential effects ....................................................................99
  Memory effects ..........................................................................99
Summary of Findings .......................................................................99
Theoretical and Practical Implications ...................................................... 100
Suppression ................................................................................................. 100
Reappraisal ................................................................................................ 103
Acceptance ................................................................................................. 104
Limitations and Suggestions for Future Research ............................................ 106
Power ........................................................................................................ 106
Measurement issues ..................................................................................... 108
Experimental manipulations ........................................................................ 110
External validity .......................................................................................... 112
Additional Areas of Future Inquiry .............................................................. 116
Summary and Conclusions ........................................................................... 118

References ................................................................................................. 120

Appendix A Health Screening Questionnaire (HSQ) ...................................... 139
Appendix B Discrete Emotions Questionnaire (Pre film version) .................... 141
Discrete Emotions Questionnaire (Post film version) .................................... 142
Appendix C Memory Test ............................................................................ 144
Appendix D Standardised Instructions for Participants in the Pilot Study ... 153
Appendix E Information Sheet (Pilot Study) ................................................ 154
Appendix F Frequency and Percentage of Correct Responses for ......... 157
Individual Memory Items in the Pilot Study
Appendix G Exit Questionnaire .................................................................... 158
Appendix H Information Sheet (Main Study) .............................................. 160
Appendix I Participant Consent Form ........................................................ 164
Appendix J Standardised Instructions (Main Study) ...................................... 165
List of Tables

Table 1. Participant Characteristics ................................................................. 72

Table 2. Participant Characteristics ............................................................... 73

Table 3. Mean Change in Negative Emotions during the Film as a Function of Instructional Condition ................................................................. 74

Table 4. Mean Change in Positive Emotions during the Film as a Function of Instructional Condition ................................................................. 75

Table 5. Analyses of Variance for Negative Emotion Variables ................................................................. 76

Table 6. Analyses of Variance for Positive Emotion Variables ................................................................. 77

Table 7. Mean Change in Physiological Responses during Instructional, Film, and Post-film Periods ................................................................. 80

Table 8. Mean Memory Performance Scores as a Function of Instructional Condition ................................................................. 81

Table 9. Mean Memory Confidence Ratings as a Function of Instructional Condition ................................................................. 83

Table 10. Power of Selected Analyses of Variance ................................................................. 88
I would like to express my deepest thanks to my supervisors, Dr Patrick Dulin and Dr Shane Harvey. The guidance, knowledge, and encouragement you both provided throughout this process was invaluable.

I am also very thankful to Dr John Podd for providing statistical advice, Malcolm Loudon for providing training in the use of physiological instruments, and Hung Ton for editing the film clips. I appreciate the time you all devoted to this project and your patience with my never ending questions and requests.

Thanks to Di and Amber for taking time out of your busy schedules to read parts of this thesis. Your ideas, feedback, and humour were greatly appreciated.

Thank you to my family for your ongoing support throughout the course of my studies. Special thanks go to my Mum for proofreading parts of my project, and to Pete, Indiya, Samara, and Cassius for providing me with the love, tolerance, support, and motivation to get it done.

Finally, my appreciation goes out to the psychology staff who assisted in the recruitment of participants, and most importantly, to the students who volunteered their time to participate in this study. Without you all, I couldn’t have done it.
Preface

Emotion regulation, defined as the strategies individuals use to “influence which emotions they have, when they have them, and how these emotions are experienced and expressed” (Gross, 1998b, p. 275), is a regular human activity that can result in a variety of consequences, some positive, others negative. Over the last decade increasing attention has been focused on emotion regulation as a common factor in a variety of physical and psychological disorders. Indeed, problems of emotion regulation and dysregulation have been implicated in more than half the DSM-IV-TR clinical disorders and all the personality disorders (American Psychiatric Association, 2000; Gross & Levenson, 1997). For instance, Major Depressive Disorder involves an excess of negative emotion, often accompanied by a decrease in positive emotion (Gross & Levenson, 1997; Sadock & Sadock, 2003), and Borderline Personality Disorder is characterised by a heightened sensitivity to emotional stimuli and a protracted emotional recovery period (Bateman, 2004; Jennings, 2004; Putnam & Silk, 2005). A growing body of literature also illustrates a relationship between disorders characterised by deficits in emotion regulation and medical conditions like chronic pain disorder (Von Korff et al., 2005) and coronary artery disease (Barrick, 1999). These findings highlight a need for research examining the advantages and disadvantages of different forms of emotion regulation (Gross, 1998b; Jackson, Malmstadt, Larsen, & Davidson, 2000; Wong, 2005). Conducting such research may help elucidate the mechanisms operating within the relationship between emotion regulation and mental and/or physical health conditions.

Clinical practice, psychological theory, and traditional wisdom have at times expressed divergent ideas regarding how humans should regulate their emotions. A central argument concerns the degree to which emotions should be avoided or controlled (Gross, 1998a). Some theorists argue that avoidance and control are potentially harmful and can lead to physical and psychological disturbances and even impair cognitive processes (i.e. Blackledge & Hayes, 2001; Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Others maintain that control-based techniques have been used successfully in the treatment of psychological problems for decades, and that
failure to control emotion can lead to disruptive, dangerous, and socially inappropriate behaviour (i.e., Beck, Rush, Shaw, & Emery, 1979).

In an effort to evaluate the relative validity of these arguments, psychological research has begun to investigate the consequences of emotion regulation strategies that vary in the nature or level of control they impose. Much of this research has explored the consequences of suppression, an avoidance-based strategy that attempts to alter emotional responses as they arise, and reappraisal, a less avoidant (but still control-based) approach that aims to alter the trajectory of emotion.

Research indicates these strategies possess divergent consequences across physiological, experiential, and cognitive domains (Gross, 1998a; Richards, 2004). For instance, reappraisal has been demonstrated to be effective in reducing emotional distress, without impinging on memory or physiology (Gross, 1998a; Richards & Gross, 2000), whereas suppression has detrimental consequences for physiology and memory, but fails to reduce emotional distress (Gross & Levenson, 1997; Richards & Gross, 2000). These findings suggest not all methods of controlling emotion are created equal, with some incurring greater costs than others. However, they fail to answer one fundamental question – what would the consequences be if individuals were encouraged to accept and experience their emotions, rather than avoid or control them?

This question is currently of particular relevance due to the increasing number of therapies emerging that incorporate acceptance-based strategies for dealing with emotions. Acceptance and Commitment Therapy (Hayes, Strosahl, & Wilson, 1999) and Dialectical Behaviour Therapy (Linehan, 1993) are two examples. These therapies are based on the rationale that it is not the experience of emotion per se or an inability to control it which causes harm, instead, harm results as a consequence of unhealthy attempts to control thoughts, feelings, and physical sensations. Rather than avoiding internal expressions of emotion, these therapies teach clients to simply notice and accept their emotions without judging them (Hayes, Follette, & Linehan, 2004).
Despite the growing number of acceptance-based therapies, relatively few controlled studies have compared acceptance techniques with other forms of emotion regulation. Furthermore, the implications of current findings are difficult to decipher due to (a) the narrow range of emotional states explored; (b) inconsistent findings pertaining to physiological effects; (c) a tendency to solely focus on physiological and self reported markers of functioning at the expense of other important domains (such as cognition); and (d) the absence of research comparing acceptance to multiple strategies that vary in the level of control they impose. The present study was designed to address these issues by experimentally comparing the impact of acceptance, suppression, and reappraisal on physiology, memory, and subjective emotional experience.

Studying the consequences of strategies that vary in the degree to which they promote avoidance or control of emotions may provide clues as to the degree to which emotional control is adaptive or maladaptive. It may also help explain the development and maintenance of disorders characterized by emotion dysregulation, and identify the components of current therapeutic modalities that are most effective in treating and/or preventing these disorders. From a physical health perspective, assessing the physiological consequences of emotion regulation may highlight the mediating mechanisms operating within the relationship between emotion regulation and physical health (Gross, 1998b). It may even identify which psychological adjuncts could be added to current medical treatment approaches to assist in the maintenance and prevention of health problems for which emotion regulation plays a role (i.e., the provision psychological services for individuals identified to be at risk for coronary artery disease). Finally, exploring the specific costs and benefits of each strategy across multiple dependent variables may highlight the contexts and individuals for which certain strategies are likely to be most adaptive within both clinical and non-clinical populations (Gross & Levenson, 1997).