http://researchspace.auckland.ac.nz

ResearchSpace@Auckland

Copyright Statement

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

This thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author’s right to be identified as the author of this thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from their thesis.

To request permissions please use the Feedback form on our webpage. http://researchspace.auckland.ac.nz/feedback

General copyright and disclaimer

In addition to the above conditions, authors give their consent for the digital copy of their work to be used subject to the conditions specified on the Library Thesis Consent Form.
HYPNOSIS, HYPERSENSITIVITY AND MOOD: SOME INTERACTIONS BETWEEN MIND AND BODY

Tannis Marilyn Laidlaw

A thesis submitted for the degree of Doctor of Philosophy in Psychiatry

University of Auckland School of Medicine 1993
ABSTRACT
Hypnosis has been used as a treatment modality to change physiological functioning almost since it was discovered. Particularly, it has been used in the treatment of psychosomatic illnesses. A series of studies was planned to explore the use of hypnosis within the context of recent advances in the field of psychoneuroimmunology. Type I hypersensitivity reactions were chosen as indicators of immunological functioning in allergy.

Study One: This study using modern methodology and statistical analyses set out to test the hypothesis that it was possible to decrease reactions to histamine by hypnotic suggestion. Five subjects, all asthmatic and untrained in hypnosis, were given three hypnotic sessions where they were asked to control their reactions to histamine. These sessions were to be compared to three baseline sessions. A decrease in reactions was noted on the second administration of histamine calling into question studies that relied on a two session comparison. On subsequent sessions much unexplained variance was encountered, with the day upon which the sessions took place contributing significant amounts of the variance, giving rise to questions about what could cause these day to day changes.

Study Two: Given the results of Study One, a method was subsequently devised in which serial, five-fold dilutions of allergen or histamine were administered to the subject’s forearm with a standard Osterballe-type prick lancetter and reactions were recorded photographically on slide film. Areas were determined by computer-assisted image analysis. Seven healthy volunteers were tested for 8 sessions (testing included Profile of Moods Scale and Brief Mood Rating questionnaires, blood pressure, pulse and skin temperature). Mean wheal size and titration gradient data from allergen reactions correlated strongly with the psychological factor of liveliness but not irritability, although no manipulation of mood was involved. A stepwise regression analysis accounted for 61% of the variance of the allergen data, and 31% was from the liveliness factor alone. Thus, the more lively the subject felt, the smaller was the allergic response.

The third study looked at a sample of 117 adult New Zealand
subjects who volunteered to be tested with the *Harvard Group Scale of Hypnotic Susceptibility (Form A)*. 38 of these people also were tested on a second test used to assess hypnotisability, the *Creative Imagination Scale*. Results indicated that the CIS can be administered with a minimum of preamble negating the value of special "think-with" instructions. It appears from the evidence in this study that both the CIS and the HGS:SHS:A measure characteristics that are stable over the years since the tests were first published. Reassuringly, they both can be used throughout the adult age group, with neither age nor sex testing differentially. The means and standard deviations were found to be similar to those of university aged students from various countries and cultures around the world over the years. The two hypnotisability tests were found to be correlated with each other but on a factor analysis each loaded separately giving evidence that the two tests are assessing different but related abilities.

Study Four was an intervention study using 38 subjects who participated in a control session and cognitive-hypnotic intervention session that used the skin test methodology developed in Study Two. When the results of the two sessions were compared, significant decreases were found in the size of the wheals after skin testing with allergen or histamine. The hypnotic method employed in this study used three specific procedures that appear to have contributed to the high success rate: challenge to the assumption that the subject has 'no imagination', self-generated scenes and the entire process had the seriousness removed so there was little or no fear of failure. Again, the significance of mood variables was considerable in ameliorating the skin test responses, and hypnotisability was a significant factor in predicting success at being able to use the intervention.

Overall, these four studies have revealed that hypnosis can be used to change at least one aspect of physiological functioning, reactivity to skin tests. Mood variables have emerged as important mediators, with implications that mood should be assessed whenever physiological variables are being measured.
ACKNOWLEDGEMENTS

First and foremost is my appreciation for all the work put in by my supervisor extraordinaire, Dr. Robert Large, who has been a constant source of encouragement and support. Bob allowed me to go with the flow of my ideas. His faith in my decisions surprised me at times, but worked as a continuous testimonial to his belief in me. He is the very model of the perfect supervisor.

Dr. Roger Booth, scientist, philosopher and friend has been involved in the experimental side of this work from the beginning as an informal supervisor. His contributions have been considerable, ranging from teaching me the immunological techniques necessary to carry out the experiments to the much appreciated constructive criticisms for my presentations and writing. His standards are high, and mine have been nudged upward because of them.

I would also like to express my appreciation to all my other colleagues at the Department of Psychiatry and Behavioural Science who have provided me with laughter, intellectual stimulation and friendship. I would also like to single out thanks for Dr. Gail Elkind, who taught me the importance of good experimental design at the beginning so that we could then analyze the results easily.

The Health Research Council of New Zealand awarded me a three year scholarship, 1990-1993, and a Young Investigators Travel Award, 1993, to enable me to present this work in Europe. I will always be proud to have been an HRC Scholar. The New Zealand Federation of University Women (Auckland Branch) made me a Post-Graduate Fellow for 1990 as well as contributed towards thesis production costs. The support from these two organisations made my living possible so that I could concentrate on this work full-time. The Walleth Trust gave a research equipment grant to enable me to collect the data for Studies One, Two and Four. I am most appreciative.

A special thank you goes to my partner, Mike Forth, and my son, Eamon Zink for all they have done and continue to do to make my life a contented one.

Lastly, I wish to thank all those marvellous subjects who allowed me to prick their skin many times over to produce some quite considerable itchiness.

My sincere appreciation to you all.
TABLE of CONTENTS

TITLE PAGE

ABSTRACT .......................................................... ii
ACKNOWLEDGEMENTS ............................................ iv
TABLE of CONTENTS ............................................... v
List of Figures .................................................. x
List of Tables ................................................... xi
List of Appendices ............................................... xiv
List of Papers .................................................... xv
List of Presentations ............................................ xv

INTRODUCTION .................................................. 4

CHAPTER ONE
WHAT IS HYPNOSIS? ............................................. 6
  HISTORY: ......................................................... 6
  STATE VS NON-STATE THEORIES OF HYPNOSIS ........ 8
  PRACTITIONERS ............................................... 13
  TOWARDS UNDERSTANDING HYPNOSIS ..................... 14
    Mediating variables ........................................ 15
    Imagination ............................................... 15
    Absorption ............................................... 16
    Alert Hypnosis ............................................ 17
    Circadian rhythms ........................................ 19
NEUROPHYSIOLOGY ................................................ 19
CONCLUSIONS .................................................... 22
# CHAPTER TWO

## THE IMMUNE SYSTEM

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>24</td>
</tr>
<tr>
<td>CELLS OF THE IMMUNE SYSTEM</td>
<td>29</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>29</td>
</tr>
<tr>
<td>Phagocytic cells</td>
<td>31</td>
</tr>
<tr>
<td>Basophils</td>
<td>33</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>33</td>
</tr>
<tr>
<td>Assays of cellular components</td>
<td>33</td>
</tr>
</tbody>
</table>

## HUMORAL COMPONENTS OF THE IMMUNE SYSTEM

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibodies</td>
<td>34</td>
</tr>
<tr>
<td>Assays of humoral components</td>
<td>36</td>
</tr>
</tbody>
</table>

### Humoral Components of Hypersensitivity Reactions

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>38</td>
</tr>
<tr>
<td>Type IV</td>
<td>40</td>
</tr>
</tbody>
</table>

## THE ALLERGIC INDIVIDUAL

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin prick tests (SPT) for allergic sensitivity:</td>
<td>41</td>
</tr>
</tbody>
</table>

## RESEARCH USING IMMUNE VARIABLES

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# CHAPTER THREE

## PSYCHONEUROIMMUNOLOGY

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>46</td>
</tr>
<tr>
<td>STRESS</td>
<td>49</td>
</tr>
<tr>
<td>Life event research</td>
<td>50</td>
</tr>
<tr>
<td>Minor stressors</td>
<td>53</td>
</tr>
<tr>
<td>Chronic stress</td>
<td>56</td>
</tr>
<tr>
<td>Attitudes towards life</td>
<td>59</td>
</tr>
<tr>
<td>In Conclusion</td>
<td>60</td>
</tr>
</tbody>
</table>

## INTERVENTION STUDIES

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classical Conditioning</td>
<td>60</td>
</tr>
<tr>
<td>Psychotherapy</td>
<td>62</td>
</tr>
<tr>
<td>Relaxation, imagery, meditation and hypnosis</td>
<td>63</td>
</tr>
</tbody>
</table>

## CONCLUSIONS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70</td>
</tr>
</tbody>
</table>
CHAPTER NINE

DISCUSSION .................................................. 176
OVERVIEW OF EXPERIMENTAL WORK ............... 176
PHYSIOLOGICAL ASPECTS OF MOOD .................... 178
DIRECTIONS FOR FUTURE RESEARCH .................. 180
  Mood ......................................................... 180
  Hypnosis ..................................................... 180
  PNI ............................................................. 183
IN CONCLUSION ............................................. 184

REFERENCES .................................................. 186
List of Figures

Figure 1.1: The Immune System .......................... 26
Figure 1.2: Immune System overview .................. 27
Figure 3.1: Mind/body interconnections ............... 47
Figure 4.1: Wheal and flare sizes for a representative subject. ........................................... 84
Figure 5.1: A typical allergen titration series. ........ 95
Figure 5.2: Calculation of dependent variables from allergic skin test responses. .................... 99
Figure 8.1: The difference in wheal size from baseline 140
Figure 8.2: Mood .......................................... 144
Figure 8.3: A regression line showing the correlation between irritability scores plotted against the wheal size proportional change scores. .......... 147
Figure 8.4: In the successful group (m=31) there was a correlation between HGSHS:A results and ability to decrease wheal sizes ......................... 156
Figure 8.5: Hypnotisability was not correlated with age in the subject group with an even distribution of age and HGSHS:A scores producing a regression line that is flat ................................. 160
Figure 8.6: Baseline session (solid line) and Intervention session (dotted line) for two representative subjects plus a theoretical representation of the diagram expected if the endpoint had shifted as well. ............................................ 164
Figure 9.1: Perry and Laurence (1983) posed a question about how one goes from the Semantic to the Somatic. .................................................. 182
List of Tables

Table 4.1: Pearson Correlations between temperature and sizes of wheals and flares. ........................................ 80
Table 4.2: Means of difference scores (VAD - hypnosis) for each subject compared using a correlated t-test procedure. ........................................ 81
Table 4.3: Regression analysis for each subject showing contributions of several variables to the sizes of wheals and flares. ........................................ 82
Table 4.4: ANOVA showing the dependent variables Wheal and Flare predicted by day. ........................................ 85
Table 5.1: Pearson Correlation Analysis (Difference Scores) Psychological Variables ........................................ 97
Table 5.2: Pearson Correlation Analysis: Physical and Psychological Variables ........................................ 98
Table 5.3: Pearson Correlation Analysis: Wheal Measures and Psychological Variables (Difference Scores) .... 100
Table 5.4: Analysis of Variance (Stepwise and ProcGLM in SAS) - (Difference Scores) Allergen Mean Wheals ........................................ 102
Table 7.1: CIS Means ........................................ 119
Table 7.2: Comparisons of CIS statistics between three countries ........................................ 120
Table 7.3: Pearson correlations of the items in the CIS ........................................ 121
Table 7.4: Comparison of Polish and New Zealand factor loadings of the CIS items on one factor only. ........................................ 122
Table 7.5: Percentages of the HGSBS:A scores using the Montreal categories. ........................................ 122
Table 7.6: Means of the HGSBS:A samples ........................................ 123
Table 7.7: HGSBS:A age and sex statistics ........................................ 124
Table 7.8: Factor Analysis loadings from the Varimax Rotation ........................................ 126
Table 8.1: Summary table explaining the session schedule for administration of titration series of allergen and histamine for atopic and non-atopic subjects on the indicated arms. ........................................ 137
Table 8.2: Comparison of Mean Wheal Sizes at different sessions in mm$^2$ ........................................ 141
Table 8.3: A Pearson Correlation Analysis showing the Profile of Mood States variables for the Successful group, n=31. ........................................... 142
Table 8.4: A Pearson Correlation Analysis showing the Profile of Mood States variables and their relationships with the Brief Mood Rating variables in the Successful group, n=31. .......... 142
Table 8.5: A factor analysis done on the POMS categories at two different sessions (n=38 each time) illustrating that all categories fell into the one factor both times. ................................. 143
Table 8.6: Means of the Successful and Unsuccessful groups from the POMS and BMR variables. .......... 145
Table 8.7: Pearson Correlations of changes in mood. .......... 146
Table 8.8: T-tests of those people who felt more peaceful by the intervention session compared with those who felt more irritable. ........................................... 146
Table 8.9: Pearson Correlation Analysis showing change in emotional factors correlated with mean wheal size proportions. ........................................... 148
Table 8.10: Pearson Correlation Analysis of the mood and attitude variables. ........................................... 150
Table 8.11: Comparison of the top and bottom quartiles in negativity (t-test procedure, two-tailed) .......................... 151
Table 8.12: Correlational analysis between the AAM and the MHLC attitude tests. ........................................... 152
Table 8.13: Table of hypnotisability scores and attitudes of negativity and success orientation in the Successful group (n=31). ........................................... 153
Table 8.14: T-test procedure used to differentiate the wheal size change at intervention of those who felt unwell (n=4) and those who felt well (n=34). .......................... 155
Table 8.15: Pearson Correlation Analysis of blood pressure changes from baseline to intervention with changes in wheal sizes and emotional variables for the less successful half (n=19). ........................................... 155
Table 8.16: Means of raw scores ........................................... 159
Table 8.17: Multiple Regression Analysis and Stepwise Analysis of Variance of all subjects, n=38. .......................... 161
Table 8.18: Multiple Regression Analysis and Stepwise Analysis of Variance of all subjects for the Successful group, n=31. .......................... 162
Table 8.19  Stepwise Analysis of Variance for the Atopic and Non-atopic groups. .......................... 162
Table 8.20: Correlated t-tests comparing gradient data, baseline to intervention, of atopic subjects (allergen on left arm, histamine on right) and non-atopic subjects (histamine on both arms).  ... 163
Table 8.21: The differences (baseline to intervention) in the topmost wheals correlated with the differences in the gradients. .......................... 165
List of Appendices

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A:</td>
<td>Brief Mood Rating Scale</td>
<td>215</td>
</tr>
<tr>
<td>Appendix B:</td>
<td>All About Me Scale</td>
<td>218</td>
</tr>
<tr>
<td>Appendix C:</td>
<td>Consent Forms</td>
<td>224</td>
</tr>
<tr>
<td>Appendix D:</td>
<td>Raw Scores of Variables</td>
<td>226</td>
</tr>
<tr>
<td>Appendix E:</td>
<td>Hypnotic Intervention</td>
<td>238</td>
</tr>
<tr>
<td>Appendix F:</td>
<td>Individual Graphs for All</td>
<td>241</td>
</tr>
</tbody>
</table>
List of Papers resulting from the work in this thesis.

1. Laidlaw, TM; Booth, RJ; Large, RG; (in press). The variability of type I hypersensitivity reactions: The importance of mood. *Journal of Psychosomatic Research*.

2. Laidlaw, TM; Richardson, DH; Booth, RJ; Large, RG. (under review). Immediate-type hypersensitivity reactions and hypnosis: Problems in methodology. *Journal of Psychosomatic Research*.


List of Presentations:


4. Presentations at the School of Medicine, University of Auckland: to the Department of General Practice, May, 1993 and to the Department of Psychiatry and Behavioural Science, April, 1993.

5. "Psychological variables and allergic skin reactivity" presented by Dr. R. Booth at the International Congress on the Regulation of Leucocyte Production and Immune Function (Joint meeting of the Australian Society of Immunology and the Society for Leucocyte Biology), Sydney, Australia, 1-5 December, 1993.