Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.
Infant Crying: Mothers' Perceptions and Affective Reactions.

A thesis presented in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Education at Massey University.

Michael Charles Brennan
1985
ABSTRACT

Two studies were conducted in order to examine three major issues arising from recent studies of mothers' reactions to their crying infants. These issues, which arise in connection with the Aversive Stimulus Model of crying, relate to (a) the relationships between cry characteristics and mothers' affective reactions to crying, (b) the variability of cry characteristics of individual infants, and (c) the influence of context on mothers' reactions to their infants' crying.

Resting on the premise that the semantic differential is an appropriate technique for addressing these issues, Study A examined the relationships between three sets of semantic differential scales. These were the scales reported by Brennan and Kirkland (1983), which represent three dimensions labelled Affect, Potency, and Evaluation; the scales reported by Zeskind and Lester (1978); and the scales reported by Mehrabian and Russell (1974a), which represent three dimensions of emotion labelled Pleasantness/Unpleasantness, Degree of Arousal, and Dominance/Submissiveness.

A combined factor analysis of cry ratings on these scales uncovered the factor structure of the Brennan and Kirkland scales and of the Mehrabian and Russell scales. The factor representing the Brennan and Kirkland Affect scales also represented both the Zeskind and Lester scales and the Mehrabian and Russell Pleasantness/Unpleasantness scales. The Brennan and Kirkland scales were found to effectively discriminate between perceptually different cry sounds. The Mehrabian and Russell scales, however, were found to be lacking in face validity and therefore unsuitable for use with cry sounds.
Study B examined the perceptions and affective reactions of mothers listening to their own infants' cries, in two situations - in the home as the crying occurred, and in an experimental situation involving tape-recorded cry samples. The results indicate that: (a) mothers affective reactions to cries did not simply depend upon the aversiveness of the cry sounds, (b) mothers' affective reactions to cries were strongly associated with their attributions regarding the causes and consequences of the cries, (c) cries from the same infant and cries from different infants varied considerably with respect to their perceived characteristics and the types of affective reactions they evoked, and (d) ratings of the tape-recorded cry samples tended to over-emphasise the relationships between cry characteristics and mothers' affective reactions, and to under-represent the extent to which negative affective reactions were experienced by the mothers in the home situation.

Several suggestions were made for future studies. These included the adoption of an individualised approach to study: (a) the cry repertoires of individual infants, (b) the types and patterns of affective reactions experienced by individual mothers, (c) mothers' attributions regarding to their own feelings and their infants' behaviors, and (d) the relationships between mothers perceptions, attributions, affective reactions, and actual caregiving behaviors.
ACKNOWLEDGEMENTS

First, I would like to express my thanks to Professor Ray Adams for his continued support in many ways during my time with the department.

My sincere thanks and appreciation are also extended to the following people whose support made this project possible:

To Dr. John Kirkland, for the opportunities to engage in a wide range of interesting and rewarding research and teaching activities, and for his encouragement, guidance and supervision.

To the parents who participated in the present studies, particularly the mothers in Study B, for their dedication and enthusiasm throughout the very demanding tasks.

To the Palmerston North Hospital Board, Dr. R. England, and Mrs A. Blanchard, for allowing me to contact mothers in the maternity annex.

To Charge Nurse Sue Bramley and Staff Nurse Pam Mackley, for their cooperation and valued assistance with the hospital fieldwork.

To David Bimler, who was responsible for the invaluable CLUSTER program.

To Dr. Peter Kay, who developed and built the audio clock, without which the home recordings would have been meaningless.

To the consultants, key operators and computer operators at the Computer Centre, for their valued assistance.

To Professor B. Springett, Department of Botany and Zoology, Mr Terry Povey, Centre for Extramural Studies, and Mr Tony True, Department of Psychology, for generously allowing me the use of recording equipment and facilities, and to Tony True and Mike Hughes, for putting their technical expertise at my disposal.

To my chief supervisor, Dr. John Kirkland, and my supervisors Drs. Alison St. George and James Chapman, for their unflagging encouragement.

To Fay Deane, friend and colleague.

And last, but not least, to Joan, my partner, to whom I owe my sanity.
CONTENTS

Abstract     ii
Acknowledgements     iv
List of Tables     x
List of Figures     xii

INTRODUCTION AND REVIEW

Objectives     1

STUDY A

Introduction     23
Objectives     32

Method
Subjects     32
Cry Signals     32
Apparatus     33
Semantic Differential Scales     33
Procedure     35
Data Analysis     36

Results
Factor Analysis
BK15 Scales     37
ZL8 Scales     38
BK15 and ZL8 combined     39
MR18 Scales     39
All scales     41
Cluster Analysis

  BK15 cry clusters 43
  BK15 scale clusters 45
  Comparison of two sets of BK15 cry clusters 47
  ZL8 cry clusters 48
  MR18 cry clusters 50

Discussion 53

STUDY B

Introduction 58

Objectives 63

Method

  Subjects 64
  Apparatus 64
    Tape-recorders 64
    Audio-clock 65
  Diary Form 65
  Cry Signals 66
    Familiarisation Cries 66
    Test Cries 66
  Semantic Differential Scales 68
    Sheet A 68
    Sheet B 69
    Sheet C 69

Procedure

  Familiarisation Phase 70
  Home Phase 71
  Experimental Phase 73
HOME PHASE

- Relationships between scales
- Dichotomous rating categories
- Cross-tabulations of Set A and Set B responses
- ADC cry categories
- ADC patterns for individual mothers
- Scale Set responses for individual mothers
- DC response patterns for individual mothers
- DC responses to individual cries
- Causes of crying
- Relationships between ratings and causes
- Reasons for responses
- Relationships between ratings and reasons
- Relationships between causes and reasons

EXPERIMENTAL PHASE

- Relationships between scales
- Dichotomous rating categories
- Cross-tabulations of Set A and Set B responses
- ADC cry categories
- ADC patterns for individual mothers
- Mean Scale Set responses for individual mothers
- Changes in mean Scale Set responses
- DC response patterns of individual mothers
Changes in DC responses for individual mothers

Changes in DC responses for individual scales

**Discussion**

**CONCLUSION**

**REFERENCES**

**APPENDIX A**

Instruction Sheet IS1 for Scale Set 1 (Study A) 162
Scale Set 1 (BK15/ZL8) for Study A (order 01) 163
Scale Set 1 (BK15/ZL8) for Study A (order 02) 164
Instruction Sheet IS2A for Scale Set 2 (Study A) 165
Instruction Sheet IS2B for Scale Set 2 (Study A) 166
Scale Set 2 (MR18) for Study A (order 01) 167
Scale Set 2 (MR18) for Study A (order 02) 168

**APPENDIX B**

Minimum Spanning Trees for Figures 1-5 169

**APPENDIX C**

Consent Form for Study B 170

**APPENDIX D**

Preliminary Medical Information Form for Study B 171

**APPENDIX E**

Preliminary Information Sheet for Study B 172

**APPENDIX F**

Diary Form for Study B: Home Phase 173

**APPENDIX G**

Plots of each Infant's Cry Bouts During Study B: Home Phase.
APPENDIX H

Instruction Sheet IA for Study B 179
Scale Sheet A for Study B 180

APPENDIX I

Instruction Sheet IB for Study B 181
Scale Sheet B for Study B 182
Scale Sheet C for Study C 183

APPENDIX J

Cry Ratings on Set A and Set B: Home Phase and Experimental Phase. 184

GLOSSARY

Acronyms used in reference to the various semantic differential scales.
List of Tables

Table 1. Semantic Differential Scales Used to Describe Cry Sounds. ........................................ 24
Table 2. Scale Terms Used to Describe Feelings Evoked by Cry Sounds. .................................. 24
Table 3. Factor Loadings for the BK15 Scales. .............................................................................. 38
Table 4. Factor Loadings for the ZL8 Scales. ................................................................................ 39
Table 5. Factor Loadings for the BK15/ZL8 Scales. ................................................................. 40
Table 6. Factor Loadings for the MR18 Scales. ............................................................................ 40
Table 7. Factor Loadings for the BK15/ZL8/MR18 Scales. ...................................................... 42
Table 8. Mean Cry Ratings and Modal Cluster Ratings on the BK15 Scales. ......................... 45
Table 9. Mean Cry Ratings and Modal Cluster Ratings on the ZL8 Scales. ............................ 50
Table 10. Mean Cry Ratings and Modal Cluster Ratings on the MR18 Scales. ..................... 52
Table 11. Characteristics of Cry Samples used in Previous Cry Studies. .................................. 59
Table 12. Factor Loadings for the Set A and Set B Scales: Home Phase. ................................. 74
Table 13. Frequency Distributions across the Seven-point and Dichotomous (DC) Categories of the Set A and Set B Scales: Home Phase. ....................................................... 77
Table 14. Proportion of Cries with High DC Ratings (DC = 2) on both Set A and Set B Scales: Home Phase. ................................................. 78
Table 15. Frequency of Set B Ratings (DC = 2) in each ADC Category: Home Phase. ............. 80
Table 16. Cries Rated by each Mother in each ADC Category: Home Phase. ........................... 83
Table 17. Frequency of each Mother's Set A and Set B Ratings (DC = 2): Home Phase. .............. 89
Table 18. Mothers' Ratings of their Infants' Cries: Home Phase. ................................................ 92
Table 19. Perceived Cause of Crying of each Infant's Cries. ...................................................... 95
Table 20. Frequency of Response (DC = 2) on the ADC and Set B Scales in each Causal Category.

Table 21. Mothers' Reasons for the Set B Responses to each of their Infants' Cries.

Table 22. Frequency of ADC and Set B Ratings (DC = 2) in each Reason Category.

Table 23. Proportion of Cries in each Reason Category with High DC Ratings (DC = 2) on Particular Set B Scales.

Table 24. Relationships between Causes of Crying, Set B Responses, and Reasons.

Table 25. Factor Loadings for the Set A and Set B Scales: Experimental Phase.

Table 26. Frequency Distributions across the Seven-point and Dichotomous (DC) Categories of the Set A and Set B Scales: Experimental Phase.

Table 27. Proportion of Cries with High DC Ratings (DC = 2) on both Set A and Set B Scales: Experimental Phase.

Table 28. Frequency of Set B Ratings (DC = 2) in each ADC Category: Experimental Phase.

Table 29. Proportion of Cries on each Set B Scale with High DC Ratings (DC = 2) in the Home Phase and Experimental Phase.

Table 30. Cries rated by each Mother in each ADC Category: Experimental Phase.

Table 31. Direction and Magnitude of Changes in Mean Scale Set Ratings from Home Phase to Experimental Phase for each Mother.

Table 32. Frequency of each Mother's Set A and Set B Ratings (DC = 2): Experimental Phase.

Table 33. Direction and Frequency of Changes in Ratings (DC = 2) on each Scale Set for each Mother.

Table 34. Direction and Frequency of Changes in Ratings (DC = 2) on each Scale Set from Home Phase to Experimental Phase.
# List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cry clusters produced from the mean BK15 scale ratings.</td>
<td>43</td>
</tr>
<tr>
<td>2</td>
<td>BK15 scale clusters produced from the mean cry ratings.</td>
<td>46</td>
</tr>
<tr>
<td>3</td>
<td>Cry clusters produced from two independent sets of BK15 scale ratings.</td>
<td>48</td>
</tr>
<tr>
<td>4</td>
<td>Cry clusters produced from the mean ZL8 scale ratings.</td>
<td>49</td>
</tr>
<tr>
<td>5</td>
<td>Cry clusters produced from the mean MR18 scale ratings.</td>
<td>51</td>
</tr>
<tr>
<td>6</td>
<td>Mean F1 ratings for the cries rated by each mother: Home Phase.</td>
<td>86</td>
</tr>
<tr>
<td>7</td>
<td>Mean F2 ratings for the cries rated by each mother: Home Phase.</td>
<td>86</td>
</tr>
<tr>
<td>8</td>
<td>Mean F3 ratings for the cries rated by each mother: Home Phase.</td>
<td>87</td>
</tr>
<tr>
<td>9</td>
<td>Mean SetB ratings for the cries rated by each mother: Home Phase.</td>
<td>87</td>
</tr>
<tr>
<td>10</td>
<td>Mean F1 ratings for the cries rated by each mother: Experimental Phase.</td>
<td>119</td>
</tr>
<tr>
<td>11</td>
<td>Mean F2 ratings for the cries rated by each mother: Experimental Phase.</td>
<td>119</td>
</tr>
<tr>
<td>12</td>
<td>Mean F3 ratings for the cries rated by each mother: Experimental Phase.</td>
<td>120</td>
</tr>
<tr>
<td>13</td>
<td>Mean SetB ratings for the cries rated by each mother: Experimental Phase.</td>
<td>120</td>
</tr>
</tbody>
</table>