

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.

# **Emotional Determinants of Test Anxiety and Academic Performance**

A thesis presented in partial fulfillment of the requirements for the degree of

Doctor of Clinical Psychology

At Massey University  
Palmerston North, New Zealand

Edwin Chun-Hong CHIN

2014



~ To our final promise ~

~ Will miss you always ~

- 匡 -



# Abstract

---

The effect of test anxiety on academic performance has been studied extensively throughout the past few decades. Recent developments in test anxiety research have largely been based within the cognitive psychology framework, where different components of *working memory* were identified to mediate the relationship between test anxiety and test performance. Similarly, the field of educational psychology has expanded this area of research to identify the different pathways in which emotional states can serve both activating and deactivating roles towards learning and achievement. From the clinical psychology perspective, the connection between emotional experiences and thought processes is an integral part of assessment which then informs ways of intervention. However, there is limited research that explicitly examines the relationship between general emotional distress and more specific forms of test-related distress, such as the cognitive and physiological components of test anxiety.

The Tripartite Model of Emotions (TME) is used to explore the connection between general emotional distress and test anxiety. The model proposed that the experiences of depression and anxiety are predisposed by a combination of three high-order dimensions of emotional distress: positive affect (or lack thereof), negative affect, and physiological hyperarousal. While researchers have identified these tripartite factors to be significant predictors of various health and performance outcomes, the degree to which the tripartite model may account for the experience of test anxiety, as well as the level of academic performance, remains unclear.

In the present study, 642 secondary school students (aged 16-19) completed a questionnaire comprised of measures of test anxiety, depression, anxiety, and the tripartite dimensions. This enabled a cross-sectional investigation into the validity of the tripartite model of emotions, as well as how test anxiety may be predicted by the higher-order factors of emotional distress. The grade point averages of a sub-sample of 188 students were gathered, which enabled a prospective investigation

into how these emotional variables influenced academic performance. Structural equation modeling was employed to simultaneously test the relationships among the aforementioned variables, and to identify an explanatory model for academic performance.

There was support for the tripartite factors' hypothesized influence on depression and test anxiety. Specifically, low levels of positive affect (PA) and high levels of negative affect (NA) influenced the experience of depressive symptoms, while high levels of negative affect and physiological hyperarousal (PH) influenced test anxiety symptoms. Negative affect was not revealed to have a direct influence on test performance. Rather, its influence may be mediated by more specific factors, including the cognitive and affective features of test anxiety. In the presence of test-related worries, negative affect may indirectly impair test performance. However, in the absence of such worries, there is potential for negative affect or the sense of emotional apprehension to facilitate better performance.

# Acknowledgements

---

The completion of this thesis would not have been possible without the guidance and support of many people. I would first like to acknowledge my supervisors, Mei-Wah Williams, Joanne Taylor, and Shane Harvey. Mei, it was an absolute pleasure and privilege to have been your student. Despite being a long-distance supervisor you were never hard to reach, and your sound guidance and advice was very much appreciated. Jo, you have my greatest respect and admiration for your knowledge, efficiency, attention to detail, and above all, your dedication towards helping your students. Your contribution both as an academic supervisor and clinical mentor has been invaluable. Shane, you have been a source of stimulating conversations and intellectual inspiration from the beginning, and I cherish all that I had learnt from you throughout my postgraduate studentship.

Thanks are due to the staff at Palmerston North Girls High School, namely the student counsellor, Brenda Pomana-Whale; senior dean and teacher, Ginnie Harcombe; and principal, Melba Scott, who provided consultation and insight during the initial development of this research. My appreciation extends to all the principals of participating schools for offering their support for this project. Of course, I would like to thank all the participants for making this project possible.

I would like to thank Prof. Bruce Chorpita, Prof. Peter Muris, Prof. Jeff Laurent, and Dr. Dejan Stevanovic, for sharing their knowledge, psychometric resources, and insightful suggestions in support of this research. Thank you to my examiners, Prof. John Spicer, Prof. Gavin Brown, and Prof. Jerrell Cassady, for their critical review of this thesis, and for their guru-class advice to help this project reach its full potential.

I would also like to take this opportunity to thank those who played a role in my clinical training, which made up a substantial and valuable part of this doctoral qualification. My sincerest gratitude is reserved for my clinical supervisor Erin Mooney for her mentoring and support through my internship. As per the consensus amongst my fellow interns, she is the epitome of awesomeness!! Thanks are due to my office buddy Anne Harvey for her immense tolerance of my



questions and for providing a listening ear whenever I felt like I was hitting walls. Thanks are also due to the clinical lead, Robyn Girling-Butcher, for overseeing my internship and for her active involvement in the DClinPsych programme. I would like to thank Cheryl Woolley and Janet Leathem for their invaluable advice as mock-examiners, and for their kind words of reassurance. My gratitude extends to Dirk Badenhorst, Przemek Dawidowski, and Rody Withers, for supervising my community placement practicums, as well as to the clinicians at the Massey Psychology Clinic, who in various ways have all helped to broaden my clinical knowledge. Last but not least, I would like to express a special thanks to Senior Clinician Jan Dickson for her wisdom and tireless efforts in supporting me and my fellow interns.

Special thanks are due to my intern-buddy Jodi Field— my internship would not have been the same without having her across the corridor, always ready to offer words of reassurance during one of our many sanity breaks. I would like to thank my other fellow interns, Kara Duxfield, Raewyn Barry, and Evelyn Aranas, for their support and encouragement. My gratitude extends to Angela Callear, Elizabeth Yan, Laura Howard, Tomoko Yamaguchi, Rifshana Fathimath, Andreas Marwick, and other pre- and post-interns for their friendship.

My friends outside of the clinical programme provided a much-appreciated sanctuary where conversations did not involve psychology, research, or the various stages of pregnancy and childbirth! Personal thanks are due to Sandy, Kevin, Grace, Tara, Karen, William, Jenny, Stan, Gloria, and Victor, for their companionship and for simply being who they are.

Thanks are due to my immediate and extended family, most of whom had been wondering for the past five years why I still didn't have a job. Thank you to my dear grandma, from whom I receive an ever-present love that transcends the need for words. Thank you also to my aunty Connie for playing the aunty role so perfectly by saying exactly what I need to hear. Finally, I sincerely thank my mother and sister for their immense patience, unwavering support, and grounded guidance.

# Table of Contents

---

Abstract .....	v
Acknowledgements.....	vii
Table of Contents .....	ix
List of Tables.....	xi
List of Figures .....	xii
List of Acronyms.....	xiii
Introduction .....	1
Chapter One    Test Anxiety.....	4
1.1    Theoretical Foundations of Test Anxiety.....	4
1.2    Contemporary Models and Measures of Test Anxiety.....	5
1.3    Interventions for Test Anxiety .....	8
1.4    Test Anxiety and Academic Performance.....	10
1.5    Depression and Anxiety as Correlates of Test Anxiety .....	15
1.5.1    Prevalence and Comorbidity of Depression and Anxiety.....	15
1.5.2    Impact of Depression and Anxiety on Academic Performance .....	18
1.6    Summary.....	20
Chapter Two    The Tripartite Model of Emotion .....	21
2.1    Assumptions of the Tripartite Model of Emotion .....	21
2.2    Measurement of the Tripartite Factors .....	22
2.3    Empirical Research on the Tripartite Model.....	23
Chapter Three    Present Study .....	27
3.1    Research Objectives.....	27
3.2    Hypotheses .....	28
Chapter Four    Method.....	29
4.1    Participants .....	29
4.1.1    Cross-sectional Study .....	29
4.1.2    Prospective Study .....	30
4.2    Measures .....	31
4.2.1    Reactions to Tests (RTT) .....	31
4.2.2    Reynolds Adolescent Depression Scale – II (RAD5-2).....	32
4.2.3    Screen for Child Anxiety Related Emotional Disorders – Revised (SCARED-R) .....	33
4.2.4    Positive and Negative Affect Schedule for Children (PANAS-C) and Physiological Hyperarousal Scale for Children (PH-C) .....	35
4.2.5    Affect and Arousal Scale (AFARS).....	36
4.2.6    Academic Performance .....	38
4.3    Procedure and Ethical Considerations.....	39
4.4    Data Analysis.....	40
Chapter Five    Results – Descriptive and Preliminary Results.....	45
5.1    Screening .....	45
5.1.1    Missing Data .....	45
5.1.2    Assumptions on Data Distribution .....	48
5.2    Descriptive Results.....	52
5.2.1    Test Anxiety .....	52

5.2.2	Depression and Anxiety.....	52
5.2.3	Tripartite Factors.....	54
5.2.4	Academic Performance.....	56
5.2.5	Summary.....	57
Chapter Six	Results – Measurement Modelling.....	59
6.1	Test Anxiety.....	59
6.2	Depression and Anxiety.....	61
6.3	Tripartite Factors.....	66
6.4	Trimmed Measurement Models.....	68
6.4.1	Trimmed Measurement Model for Test Anxiety.....	68
6.4.2	Trimmed Measurement Models for Depression and Anxiety.....	71
6.4.3	Trimmed Measurement Model for the Tripartite Factors.....	78
Chapter Seven	Results – Structural Modelling.....	81
7.1	Cross-sectional Model of Test Anxiety.....	81
7.2	Prospective Model of Academic Performance.....	88
Chapter Eight	Discussion.....	95
8.1	Cross-Sectional Study – Tripartite Model of Emotions.....	95
8.2	Prospective Model.....	100
8.3	Implications for Practice.....	103
8.4	Strengths, Limitations, and Future Directions.....	105
8.5	Conclusions.....	108
References.....		110
Appendices.....		129
Appendix A – Information Sheet.....		131
Appendix B – Consent Form.....		132
Appendix C – Study Questionnaire.....		133
Appendix D – Summary of Preliminary Results for Participants.....		143
Appendix E – Email Summary of Final Results for Participants.....		144
Appendix F – Residual Plots for Homoscedasticity.....		145
Appendix G – Item Contents for the Trimmed Measurement Models.....		146
Appendix H – Comparison of Tripartite Dimension Intercorrelations between Studies.....		147

# List of Tables

---

Table 4.1	<i>Adopted Criteria for Adequate Fit Across Cross-Sectional and Prospective Analyses</i> .....	44
Table 5.1	<i>Missing Data by Measure</i> .....	46
Table 5.2	<i>Missing Data by Participant</i> .....	47
Table 5.3	<i>Influence of Outliers</i> .....	48
Table 5.4	<i>Univariate Normality of Distribution for All Scales and Subscales</i> .....	50
Table 5.5	<i>Descriptive Data and Intercorrelations of RTT Subscales for Test Anxiety</i> .....	52
Table 5.6	<i>Descriptive Data and Intercorrelations of RADS-II Subscales for Depression</i> ....	53
Table 5.7	<i>Descriptive Data for the SCARED-R Scales of Anxiety</i> .....	53
Table 5.8	<i>Intercorrelations of the SCARED-R Subscales for Anxiety</i> .....	54
Table 5.9	<i>Descriptive Data and Intercorrelations for the Tripartite Factors</i> .....	55
Table 5.10	<i>Correlations of the Tripartite Factors with Anxiety, Depression, and Test Anxiety</i> .....	56
Table 5.11	<i>Pearson's r Correlations Between Scales and Grade Point Average</i> .....	57
Table 6.1	<i>Goodness-of-Fit Indices for Measurement Models of the RTT</i> .....	59
Table 6.2	<i>Goodness-of-Fit Indices for Measurement Models of the RADS-II</i> .....	62
Table 6.3	<i>Goodness-of-Fit Indices for Measurement Models of the SCARED-R</i> .....	64
Table 6.4	<i>Goodness-of-Fit Indices for Measurement Models for the Tripartite Factors</i> ...	66
Table 6.5	<i>Goodness-of-Fit Indices for Trimmed Measurement Models of the RTT</i> .....	69
Table 6.6	<i>Goodness-of-Fit Indices for Trimmed Measurement Models of the RADS-II</i> .....	73
Table 6.7	<i>Goodness-of-Fit Indices for Trimmed Measurement Models of the SCARED-R</i> .74	
Table 6.8	<i>Goodness-of-Fit Indices for Measurement Models of Depression and Generalised Anxiety</i> .....	78
Table 6.9	<i>Goodness-of-Fit Indices for Trimmed Measurement Models of the Tripartite Factors</i> .....	80
Table 7.1	<i>Goodness-of-Fit for the Structural Models of Test Anxiety</i> .....	85
Table 7.2	<i>Goodness-of-Fit for the Structural Models of Test Performance</i> .....	90
Table 7.3	<i>Tests of Conditions for Mediation</i> .....	93
Table G	<i>Content of Items Used to Represent to Latent Variables in Structural Modelling</i>	146
Table H	<i>Pearson's r Correlations of the Tripartite Factors for PH-PANAS and AFARS Across Comparable Studies</i> .....	147

# List of Figures

---

<i>Figure 6.1.</i> Hierarchical measurement model (model 1) of test anxiety.....	60
<i>Figure 6.2.</i> Multi-dimensional measurement model (model 2) of test anxiety. ....	61
<i>Figure 6.3.</i> Hierarchical measurement model (model 1) of depression. ....	63
<i>Figure 6.4.</i> Multi-dimensional measurement model (model 2) of depression.....	63
<i>Figure 6.5.</i> Hierarchical measurement model (model 1) of anxiety. ....	65
<i>Figure 6.6.</i> Multi-dimensional measurement model (model 2) of anxiety.....	65
<i>Figure 6.7.</i> Measurement model of the tripartite factors using the PH-PANAS-C. ....	67
<i>Figure 6.8.</i> Measurement model of the tripartite factors using the AFARS. ....	67
<i>Figure 6.9.</i> Trimmed hierarchical measurement model of test anxiety. ....	70
<i>Figure 6.10.</i> Trimmed multidimensional measurement model of test anxiety. ....	70
<i>Figure 6.11.</i> Trimmed hierarchical measurement model of depression. ....	71
<i>Figure 6.12.</i> Trimmed multidimensional measurement model of depression. ....	72
<i>Figure 6.13.</i> Trimmed hierarchical measurement model of anxiety. ....	75
<i>Figure 6.14.</i> Trimmed multidimensional measurement model of anxiety. ....	75
<i>Figure 6.15.</i> Initial measurement model (model 1) of depression and anxiety. ....	76
<i>Figure 6.16.</i> Alternative measurement model (model 2) of depression and anxiety.....	77
<i>Figure 6.17.</i> Trimmed measurement model of the tripartite factors with PANAS-C. ....	78
<i>Figure 6.18.</i> Trimmed measurement model of the tripartite factors with AFARS. ....	79
<i>Figure 7.1.</i> Initial structural model for test anxiety. ....	82
<i>Figure 7.2.</i> Schematic presentation of initial structural model of test anxiety. ....	84
<i>Figure 7.3.</i> Reduced structural model of test anxiety (model 2). ....	86
<i>Figure 7.4.</i> Final model (Model 3) of test anxiety for the cross-sectional sample of N = 617. .....	87
<i>Figure 7.5.</i> Final model (model 3) of test anxiety for the prospective sample of N = 188. ...	88
<i>Figure 7.6.</i> Exploratory structural model (model 1) for test performance.....	89
<i>Figure 7.7.</i> Alternative structural model (model 2) of test performance.....	90
<i>Figure 7.8.</i> Alternative structural model (model 3) of test performance.....	91
<i>Figure 7.9.</i> Final structural model (model 4) for test performance.....	92
<i>Figure F.1.</i> Residual plot for cross-sectional sample.....	145
<i>Figure F.2</i> Residual plot for the prospective sample .....	145

# List of Acronyms

---

AFARS	-	Affect and Arousal Scale
AIC	-	Akaike Information Criteria
APA	-	American Psychiatric Association
CDI	-	Children’s Depression Inventory
CFI	-	Comparative Fit Index
CR	-	Critical Ration
df	-	Degrees of freedom
ECVI	-	Expected Cross-Validation Index
EFC	-	Emotion-focused coping
GAD	-	Generalised Anxiety Disorder
GPA	-	Grade point average
n.d.	-	No date
(N)MAR	-	(Not) missing at random
NA	-	Negative affect
NCEA	-	National Certification of Educational Achievement
OCD	-	Obsessive Compulsive Disorder
PA	-	Positive affect
PET	-	Processing efficiency theory
PFC	-	Problem-focused coping
PGFI	-	Parsimony Goodness of Fit Index
PH	-	Physiological hyperarousal
PH-PANAS-C	-	Positive and Negative Affect Schedule for Children & Physiological Hyperarousal Scale for Children
PNFI	-	Parsimony Normed Fit Index
RADS-II	-	Reynolds Adolescent Depression Scale – Second edition
RCMAS	-	Revised Children’s Manifest Anxiety Scale
RMSEA	-	Root Mean Square of Approximation
RTT	-	Reactions to Tests
SCARED-R	-	Screen of Children’s Anxiety Related Emotional Disorders – Revised
SD	-	Standard deviation
SEM	-	Structural equation modeling
STAI-C	-	State Trait Anxiety Inventory for Children
TAI	-	Test Anxiety Inventory
TLI	-	Tucker-Lewis Index
TME	-	Tripartite Model of Emotions