

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.

UNDERSTANDING SUBJECTIVE MEMORY COMPLAINTS IN AGEING

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

Doctor of Philosophy

in

Psychology

at Massey University, Wellington, New Zealand

Bridget R. Burmester

2017

Abstract

Everyday memory difficulties are a common experience with age, and cause considerable distress for many people when they are interpreted as potential indicators of age-related disease. However, research literature examining the relationship between these difficulties (known as *subjective memory complaints*; SMCs) and actual memory performance on neuropsychological tests has shown mixed results, suggesting that SMCs are not a pure reflection of memory ability, but instead that their aetiology is complicated and not fully understood. Both psychological and methodological factors are also implicated, although no research has yet comprehensively examined how a combination of these factors might predict SMCs.

The current research aimed to test a new aetiological model of SMCs that incorporated a range of potential confounds. It was hypothesised that SMCs would be predicted by measures of processing speed and executive functioning, and that this relationship would be moderated by measures of anxiety and depression.

First, a meta-analysis and systematic review of existing research on the relationship between subjective and objective memory was conducted as a platform to inform subsequent analyses. Then, Study A addressed current variation in assessment methods by describing differences in SMCs when assessed with both an open-ended measure and a prescriptive questionnaire. Study B examined how these differences in subjective reports related to objective memory performance. Finally, Study C tested the proposed aetiological model of SMCs.

Study A showed that different measures of SMCs garnered non-overlapping reports. SMCs gathered via the open-ended measure were fewer in number, but rated as more distressing, than those endorsed on the questionnaire. Spontaneous reports appeared to be more ecologically valid reflections of SMCs, although questionnaire assessments

were by their nature more robust to a “catch 22” situation whereby some endorsed SMCs were not reported spontaneously (perhaps due to memory failures in themselves). Study B found that neither method of assessing SMCs produced reports that were significantly convergent with objective measures of memory functioning. Study C found partial support for the hypothesised aetiological model. SMCs (as assessed by the questionnaire) were inversely related to processing speed, but only when depressive symptoms were relatively high. Collectively, results offer important insights into the interaction of cognitive and psychological factors in explaining SMCs, and highlight the previously undelineated context in which processing speed contributes to SMCs.

Acknowledgements

This thesis is far from mine alone - there are many people who made a difference to its final form and its existence at all. Most of all is my primary supervisor Professor Janet Leathem. Your experience and wisdom was instrumental in the quality of this project. No one else has simultaneously taught, inspired and encouraged me while still giving me room to grow independently. Thank you for your thoughtfulness, relentless positivity, and support.

Thank you to my secondary supervisor Associate Professor Paul Merrick, whose helpful comments and expertise are so much appreciated. Thanks also to Steve Humphries and John Spicer for their help with statistical methods.

This project would look much different if not for the financial support of Massey University through a Doctoral Scholarship, and the HOPE-Selwyn Foundation through a Scholarship for Research on Ageing. Without these I would not have been so lucky as to work with research assistants Yanis Brinkmann, Kate Ross-McAlpine and Charlotte Wainwright. I am humbled by how willingly you all helped with my research before you had even begun your own. Thank you for your hard work.

To the participants, thank you for your time, effort, and enthusiasm for being a part of this project. I feel truly privileged that you so selflessly shared your stories with me and demonstrated such a genuine interest in this research and my journey through it. You continue to inspire me both professionally and personally.

To my family and friends, my deepest gratitude. So many of you helped make this project successful. In particular thank you to Kylee and Lucia, who I know believed in me even when I didn't believe in myself. You are the kind of people I hope to be. Thank you to my Mum, who taught me how to learn, how to work hard and how to tell

a story. Finally, thank you to my husband Dane, who stood beside me on this journey even in the darkest of places. It is because of you that I am here.

Table of Contents

Abstract	iii
Acknowledgements	v
Table of Contents	vii
List of Tables	xi
List of Figures	xii
List of Abbreviations	xiii
Preface	1
Thesis Overview	5
CHAPTER 1	
SUBJECTIVE COGNITIVE COMPLAINTS AND OBJECTIVE COGNITIVE FUNCTION IN AGEING: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RECENT CROSS-SECTIONAL FINDINGS	7
Abstract	8
Introduction	9
Early Reviews	10
Jonker and colleagues (2000)	10
Reid and MacLulich (2006)	11
Recent Reviews	12
Crumley, Stetler, and Horhota (2014)	12
Mitchell, Beaumont, Ferguson, Yadegarfar, and Stubbs (2014)	13
Mendonça, Alves, and Bugalho (2016)	13
Current Review	14
Method	15
Notes on Terminology	16
Statistical Analysis	18
Results	19
Meta-analysis	19
Subsidiary Analysis	26
Evidence for a link with objective performance	27
Evidence for the influence of depression	28
Evidence against the influence of depression	29
Other confounds	31
Absence of evidence for a link with objective performance	33
Summary	34
Discussion	35
Suggestions for Future Research	40
Clinical Implications	41
Limitations	42
Conclusions	43
References	45
CHAPTER 2	
THEORIES OF COGNITIVE AGEING	58
Introduction	59
Patterns of Cognitive Ageing	59
Memory	59
Theories of Cognitive Ageing	63
Processing Speed Theory	64
Executive Function Theory	66
Combining Theories of Cognitive Ageing	69
Subjective Cognitive Complaints and Theories of Cognitive Ageing	70
Summary	72

CHAPTER 3	
SUBJECTIVE COGNITIVE COMPLAINTS AND PSYCHOLOGICAL, DEMOGRAPHIC AND ASSESSMENT FACTORS	74
Introduction	75
Psychological Variables	75
Depression	75
Anxiety	77
Personality	78
Other Psychological Variables	80
Summary	83
Demographic Variables	83
Assessment Variables	84
Conclusion	85
CHAPTER 4	
RESEARCH FORMULATION	88
Overview	89
Summary of Background Literature	89
Note on Terminology	90
Current Research	91
Aims	91
Constructs Included	92
Research Questions and Hypotheses	93
General Method	94
Participants	94
Materials	96
Survey	96
Demographic and general information	96
Spontaneously reported memory difficulties	96
Memory difficulties questionnaire	97
Neuropsychological testing	98
Rey Auditory Verbal Learning Test: Immediate Recall	99
Rey Complex Figure Test: Copy	100
Stroop	100
Rey Complex Figure Test: Immediate Recall	101
Symbol Search	101
Coding	101
Rey Auditory Verbal Learning Test: Delayed Recall	102
Beck Depression Inventory	102
State-Trait Anxiety Inventory	102
Rey Complex Figure Test: Delayed Recall	103
Trail Making Test	103
Coin Rotation Task	103
Verbal Fluency Test	104
National Adult Reading Test	104
Procedure	104
Survey	104
Neuropsychological testing	105
Test Scoring and Norms	107
Survey	107
Qualitative data	107
Quantitative data	107
Neuropsychological Testing	108
Preliminary Analyses	109
Survey	109
Neuropsychological Testing	110
Missing data	110

Inter-rater reliability	110
Administrative effects	110

CHAPTER 5

ASSESSING SUBJECTIVE MEMORY COMPLAINTS: A COMPARISON OF SPONTANEOUS REPORTS AND STRUCTURED QUESTIONNAIRE METHODS **112**

Abstract	113
Introduction	114
Method	117
Participants	117
Measures	117
Procedure	120
Data Analysis	120
Results	121
Preliminary Analyses	121
Spontaneously Reported Memory Difficulties	123
Questionnaire Assessment of Memory Difficulties	127
Comparison of Assessment Methods	130
Discussion	132
Implications	135
Future Research	137
Limitations	138
Summary	139
References	140

CHAPTER 6

INFLUENCE OF ASSESSMENT METHODS ON SUBJECTIVE AND OBJECTIVE MEMORY IMPAIRMENT **144**

Abstract	145
Introduction	146
Method	148
Participants	148
Measures	149
Survey	149
Neuropsychological testing	149
Procedure	149
Data Analysis	150
Results	150
Preliminary Analyses	150
Data Screening	151
Canonical Correlation	151
Discussion	152
Limitations	153
Conclusion	154
References	155

CHAPTER 7

INTERACTION OF COGNITIVE AND AFFECTIVE FACTORS IN EXPLAINING SUBJECTIVE MEMORY COMPLAINTS **160**

Abstract	161
Introduction	162
The Current Study	164
Method	165
Participants	165

Procedure	165
Measures	166
Subjective memory complaints	166
Objective cognitive functioning	166
Depression and anxiety symptoms	167
Covariates	167
Data Analysis	167
Results	169
Descriptive Statistics	169
Univariate Results	169
Multivariate Results	173
Discussion	175
Implications	179
Limitations	179
Future Research	181
Conclusion	182
References	183
CHAPTER 8	
GENERAL DISCUSSION	192
Overview	193
Research Questions	193
Strengths and Limitations	195
Survey	195
Neuropsychological Testing	196
Contribution to the Literature	197
Personal Reflections	197
Thesis References	200
APPENDICES	
Appendix A. Statements of contribution	235
Appendix B. Ethical approval	237
Appendix C. Survey advertisement	238
Appendix D. Initial recruitment email	239
Appendix E. Secondary recruitment emails	241
Appendix F. Survey	243
Appendix G. Existing scales assessing subjective memory complaints	252
Appendix H. Creation of subjective memory complaints questionnaire	261
Appendix I. Survey information sheet	276
Appendix J. Testing information sheet	279
Appendix K. Testing consent form	281
Appendix L. Psychoeducational pamphlet	282
Appendix M. Example testing results and feedback	284
Appendix N. Parallel analysis of survey results	288
Appendix O. Poster presented at conference	295

List of Tables

Table 1. Characteristics of Included Studies	20
Table 2. Results of Subgroup Meta-Analyses	27
Table 3. Descriptive Statistics of Sample by Age Group.....	118
Table 4. Coding Categories and Descriptive Statistics of Spontaneously Reported Memory Difficulties	124
Table 5. Comparisons of Distress Ratings for Matched Questionnaire Items and Spontaneously Reported Memory Difficulties	128
Table 6. Percentage of Participants in Each Demographic Category.....	148
Table 7. Sources of Norms for Neuropsychological Measures.....	168
Table 8. Test Score Descriptive Statistics (z-scores for sample)	170
Table 9. Test Score Correlations	172
Table H1. Content Analysis of Existing Questionnaires.....	261
Table H2. Frequencies and Questionnaire Inclusion Decisions for Categories of Spontaneously Reported Subjective Memory Complaints.	271
Table N1. Test Score Descriptive Statistics (z-scores for sample).....	289
Table N2. Test Score Correlations	290

List of Figures

Figure 1. Relationships between chapters in the thesis.	5
Figure 2. Selection process for study inclusion.	17
Figure 3. Forest plot of individual and mean weighted effect sizes.	25
Figure 4. Funnel plot of observed studies' effect sizes and corrections for potential publication bias.	26
Figure 5. Patterns of age-related change in different types of memory.	60
Figure 6. Number of potential participants at each stage of the research.	94
Figure 7. Proposed aetiological model of subjective memory complaints.	165
Figure 8. Moderation of the effect of processing speed on subjective memory complaints by depressive symptoms.	175
Figure N1. Example of approximate pattern of normed scores for one participant.	284

List of Abbreviations

BDI-II	Beck Depression Inventory (2 nd edition)
CAMDEX	Cambridge Mental Disorders of the Elderly Examination
CES-D	Center for Epidemiological Studies Depression scale
CI	Cognitive Impairment
CRT	Coin Rotation Task
GDS	Geriatric Depression Scale
ICC	Intraclass Correlation Coefficient
IQ	Intelligence Quotient
M	Mean
MAC-Q	Memory Complaint Questionnaire
MCI	Mild Cognitive Impairment
MMQ-A	Meta-Memory Questionnaire (Ability subscale)
MMSE	Mini Mental State Examination
N	Number of participants
NART	National Adult Reading Test
NR	Not Reported
NS	No Screen used
RAVLT	Rey Auditory Verbal Learning Test
RCFT	Rey Complex Figure Test
SCC	Subjective Cognitive Complaint
SD	Standard Deviation
SMC	Subjective Memory Complaint
SMCQ	Subjective Memory Complaints Questionnaire
SPSS	Statistical Package for the Social Sciences
STAI	State-Trait Anxiety Inventory
TMT	Trail Making Test
WAIS-IV	Wechsler Adult Intelligence Scale (4 th edition)

