Flow at Work: The Development and Validation of a Measure

Submitted by

Christopher James Holt

B. Soc. Sci. (Hon.)

A thesis submitted in total fulfillment of the requirements of the degree of

Doctor of Philosophy (Psychology)

School of Psychology

Faculty of Arts and Sciences

Australian Catholic University, St Patrick's Campus

Research Office

Australian Catholic University Limited

St. Patrick Campus

Level 5, 250 Victoria Pde, Fitzroy VIC 3085

March 2012

Statement of Authorship and Sources

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

No parts of this thesis have been submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgment in the main text of the thesis.

All research procedures reported in the thesis received the approval of the relevant Ethics/Safety Committees (where required).

Christopher James Holt

____

29th April 2013

Acknowledgements

I wish to acknowledge the assistance and support of the following people in the undertaking of this thesis:

- My sincerest gratitude goes to Professor Barry Fallon for his supervision as principal supervisor prior to his retirement and continued support after his retirement. His unparalleled guidance and support maintained my high level of motivation and enjoyment throughout the completion of this thesis. He created the ideal environment that allowed me to grow in ways that were previously unimaginable. It has been both a pleasure and a privilege to have worked with him;
- To Associate Professor Sabine Hammond for her role as principal supervisor after Professor Barry Fallon's retirement;
- To Doctor Xochitl de la Piedad Garcia (principal supervisor) and Doctor Leah Kaufmann (associate supervisor) for the supervision of amendments post examination;
- To Dr. Timothy Sharp and Ms. Ingrid Ozols who both kindly assisted in the dissemination of research advertisements to potential participants;
- To my parents, Peter and Aureen; partner, Charlene; and friends for their enduring support and patience during the completion of this thesis;
- Lastly, I would like to sincerely thank all those who kindly volunteered to participate in this research.

Table of Contents

Statement of Authorship and Sources i

Acknowledgements ii

List of Tables xiv

List of Figures xvii

List of Appendices xviii

List of Abbreviations xx

Abstract xxiii

Chapter 1: Overview 1

1.1 Introduction 1

1.2 Aims 1

1.3 Presentation of Chapters 2

Chapter 2: The Need for Positive Psychology 3

2.1 Overview 3

2.2 A Brief History of Western Psychology 3

2.3 Issues and Limitations of Accomplishments 3

2.3.1 Effectiveness 4

2.3.2 Validation 5

2.3.3 Help seeking and compliance Issues 5

2.3.4 Inappropriate classification of normal and abnormal 6

2.3.5 Do psychological disorders actually exist and are we overpathologised? 6

2.4 Future Direction – Positive Psychology 6

2.4.1 Positive psychology's contributions 7

2.4.1.1 Positive organisational movement 9

2.4.1.1.1 Positive organisational behaviour 10

2.4.1.1.2 Positive organisational scholarship 10

2.5 Conclusion 11

Chapter 3: Flow **12**

3.1 Overview 12

3.2 Origins of Flow 12

3.3 Characteristics of Flow 13

3.3.1 Balance between challenge and skills 13

3.3.2 Clear goals 14

3.3.3 Unambiguous feedback 15

3.3.4 Control 15

3.3.5 Deep concentration 15

3.3.6 Transformation of time 16

3.3.7 Merging of action and awareness 17

3.3.8 Loss of self-consciousness 18

3.3.9 Autotelic experience 18

3.4 Consequences of Flow 19

3.4.1 Complexity and development 19

3.4.2 Performance 19

3.4.3 Well-being 20

3.4.4 Self-esteem 21

3.4.5 Addictive nature 21

3.4.6 Theoretical explanation for the consequences of flow 22

3.5 Conditions for Flow 23

3.5.1 Autotelic personality 23

3.5.2 Situational characteristics that predict flow 24

3.6 Practical Applications of Flow 25

3.6.1 Leisure, play, and free time 25

3.6.2 Sports and physical activity 27

3.6.3 Education 28

3.6.4 Work 28

3.6.5 Other applications of flow theory 31

3.7 Other Positive Experiential Constructs 31

3.7.1 Peak experience 31

3.7.2 Peak performance 34

3.7.3 Absorption 36

3.8 Similarities and Differences Between Peak Experience, Peak Performance, Absorption, and Flow 37

3.9 Conclusion 38

Chapter 4: Similarities Between Flow Theory and Work Motivation Theories and Related Concepts 40

4.1 Overview 40

4.2 Existing Work Motivation Theories and Related Concepts 40

4.2.1 Job characteristics model 40

4.2.2 Self-determination theory 42

4.2.3 Goal setting theory 45

4.2.4 Employee engagement 47

4.3 Conclusion 49

Chapter 5: A Critical Review of the Assessment of Flow 51

5.1 Overview 51

5.2 Recommended Steps Necessary for Scale Development 51

5.2.1 Content validity 53

5.2.2 Criterion-related validity 54

5.2.3 Construct validity 54

5.3 Measuring Flow 54

5.3.1 Interviews 54

5.3.2 Diaries 55

5.3.3 Experience sampling method 55

5.3.4 The Flow Questionnaire 59

5.3.5 Flow Experience Survey 60

5.3.6 Short Flow Scale 62

5.3.7 Core Flow Scale 64

5.3.8 Work-Related Flow Inventory 65

5.3.9 Nielsen Flow Scale 66

5.3.10 The Flow State Scale-2 and Dispositional Flow Scale-2 68

5.4 Conclusion 69

Chapter 6: Development of the Conditions to Flow and Flow Scales 71

6.1 Overview 71

6.2 Introduction 71

6.2.1 Conditions to flow 72

6.2.1.1 Balance between challenge and skills 72

6.2.1.2 Clear goals 73

6.2.1.3 Unambiguous feedback 74

6.2.1.4 Control 74

6.2.2 The flow experience 75

6.2.2.1 Merging of action and awareness 75

6.2.2.2 Deep concentration 75

6.2.2.3 Loss of self-consciousness 76

6.2.2.4 Transformation of time 76

6.2.3 Outcome of flow 76

6.2.3.1 Autotelic experience 76

6.3 Study 1: Initial Development and Evaluation of the Conditions to Flow and Flow Scales 77

6.3.1 The aim of the present study 77

6.3.2 Method 77

6.3.2.1 Initial scale development 77

6.3.2.2 Demographic measures 79

6.3.2.3 Participants 79

6.3.2.4 Procedure 79

6.3.2.5 Data analysis 80

6.3.3 Results 81

6.3.3.1 Data screening 81

6.3.3.2 Initial EFA – Conditions to Flow Scale 82

6.3.3.3 Revised EFA – Conditions to Flow Scale 86

6.3.3.4 Cronbach's alpha coefficients for the revised EFA – conditions to flow 88

6.3.3.5 Initial EFA – Flow Scale 89

6.3.3.6 Revised EFA – Flow Scale 92

6.3.3.7 Cronbach's alpha coefficients for the revised EFA – flow 95

6.3.4 Study 1 discussion 96

6.4 Study 2: Revised Development of the Conditions to Flow and Flow Scales 101

6.4.1 Introduction 101

6.4.2 Method 101

6.4.2.1 Revised scale development 101

6.4.2.2 Demographic measures 103

6.4.2.3 Participants 103

6.4.2.4 Procedure 103

6.4.2.5 Data analysis 104

6.4.3 Results 104

6.4.3.1 Data screening 104

6.4.3.2 Initial EFA – revised Conditions to Flow Scale 105

6.4.3.3 Revised EFA – revised Conditions to Flow Scale 108

6.4.3.4 Cronbach's alpha coefficients for the revised EFA – conditions to flow 110

6.4.3.5 Higher-order FA for the revised Conditions to Flow Scale 111

6.4.3.5.1 Data screening 111

6.4.3.5.2 Higher-order FA 111

6.4.3.5.3 Cronbach's alpha coefficients for the higher-order conditions to flow factor 114

6.4.3.6 Initial EFA – revised Flow Scale 114

6.4.3.7 Revised EFA – revised Flow Scale 117

6.4.3.8 Cronbach's alpha coefficients for the revised EFA – flow 119

6.4.3.9 Higher-order FA for the revised Flow Scale 120

6.4.3.9.1 Data screening 120

6.4.3.9.2 Higher-order FA 120

6.4.3.9.3 Cronbach's alpha coefficients for the higher-order flow factor 123

6.4.4 Study 2 discussion 123

6.5 Conclusion 126

Chapter 7: Validity of the Conditions to Flow and Flow Scales 127

7.1 Overview 127

7.2 Introduction 127

7.2.1 Known group validity 127

7.2.2 Discriminant validity 129

7.2.3 Convergent validity 129

7.2.4 Factorial validity 130

7.2.5 Objectives of the studies 130

7.3 Study 3: Known Group and Discriminant Validity 131

7.3.1 Overview 131

7.3.2 Method 131

7.3.2.1 Participants 131

7.3.2.2 Measures 134

7.3.2.3 Procedure 135

7.3.2.4 Data analysis 136

7.3.3 Results 137

7.3.3.1 Known group validity 138

7.3.3.2 Discriminant validity 139

7.3.4 Study 3 discussion 140

7.3.4.1 Known group validity 141

7.3.4.2 Discriminant validity 143

7.4 Participant Details, Data Collection Procedures, and Data Screening for Study 4, 5, and 6 143

7.4.1 Data collection procedures 143

7.4.2 Participants 144

7.4.3 Overall data screening 144

7.4.3.1 Item level data screening 144

7.4.3.2 Scale level data screening 146

7.5 Study 4: Convergent Validity 146

7.5.1 Overview 146

7.5.2 Method 146

7.5.2.1 Participants 146

7.5.2.2 Measures 147

7.5.2.3 Procedure 147

7.5.2.4 Data analysis 147

7.5.3 Results 147

7.5.4 Study 4 discussion 148

7.6 Study 5: Factorial Validity 149

7.6.1 Overview 149

7.6.2 Method 149

7.6.2.1 Participants 149

7.6.2.2 Measures 149

7.6.2.3 Procedure 150

7.6.2.4 Data analysis 150

7.6.3 Results 154

7.6.3.1 Data screening 154

7.6.3.2 CFA conditions to flow scale 155

7.6.3.3 CFA flow scale 158

7.6.4 Study 5 discussion 162

7.7 Conclusion 162

Chapter 8: Antecedents and Outcomes of Flow 164

8.1 Overview 164

8.2 Study 6: Introduction 164

8.2.1 Antecedents to flow 164

8.2.2 Outcomes of flow 165

8.3 Method 169

8.3.1 Participants 169

8.3.2 Measures 169

8.3.3 Procedure 171

8.3.4 Data analysis 171

8.4 Results 174

8.4.1 Data screening prior to assessing the unidimensionality of latent variables in the structural model 174

8.4.2 Assessing the unidimensionality of latent variables in structural model 174

8.4.3 Structural model testing 176

8.5 Discussion 180

8.6 Conclusion 184

Chapter 9: General Discussion and Conclusion 185

9.1 Overview 185

9.2 General Discussion 185

9.2.1 Examination of the flow model 186

9.2.2 Development of scales 187

9.2.3 Revised scales 187

9.2.4 Validity of both scales 188

9.2.4.1 Known group validity 188

9.2.4.2 Discriminant validity 189

9.2.4.3 Convergent validity 189

9.2.4.4 Further factorial validity 190

9.2.4.5 Predictive validity 190

9.2.5 Antecedents of flow 190

9.2.6 Outcomes of flow 190

9.3 Thesis Contributions and Implications 191

9.3.1 Development of scales 191

9.3.2 Importance of flow theory to the workplace 192

9.4 Limitations 193

9.5 Future Directions 194

9.6 Conclusion 195

References 197

Appendices 225

List of Tables

Table 6.1: Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (*N* = 230) 84

Table 6.2: Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (*N* = 230) 87

Table 6.3: Conditions to Flow, Revised Four Factor Correlation Matrix (*N* = 230) 88

Table 6.4: Cronbach's alpha Coefficients for the Four Factors 88

Table 6.5: Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Flow Items (*N* = 230) 90

Table 6.6: Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Three Factor Solution of the Flow Items (*N* = 230) 94

Table 6.7: Flow, Revised Three Factor Correlation Matrix (*N* = 230) 95

Table 6.8: Cronbach's alpha Coefficients for the Three Flow Factors 95

Table 6.9: Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (*N* = 320) 106

Table 6.10: Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (*N* = 320) 109

Table 6.11: Conditions to Flow, Revised Four Factor Correlation Matrix (*N* = 320) 110

Table 6.12: Cronbach's alpha Coefficients for the Four Factors 110

Table 6.13: Factor Structure Coefficients and Variance Sources for the Conditions to Flow Based on the Orthogonalised Higher-Order Factor Model (N = 318) 112

Table 6.14: Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Five Factor Solution of the Flow Items (*N* = 311) 115

Table 6.15: Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Five Factor Solution of the Flow items (N = 311) 118

Table 6.16: Flow, Revised Five Factor Correlation Matrix (*N* = 311) 119

Table 6.17: Cronbach's alpha Coefficients for the Four Factors 120

Table 6.18: Factor Structure Coefficients and Variance Sources for Flow Based on the Orthogonalised Higher-Order Factor Model (N = 311) 121

Table 7.1: Demographic Characteristics of the Low and High-Flow Groups, and Total Sample (Groups Combined) 133

Table 7.2: Means, Standard Deviations and Cronbach's alpha Coefficients for Grouped Data for the Conditions to Flow and Flow Scales 139

Table 7.3: Attenuated and Disattenuated Pearson's Product-Moment Correlations of the Conditions to Flow and Flow Scales With Social Desirable Responding, Self-Deceptive Positivity, and Impression Management (*N* = 167) 140

Table 7.4: Proportion of missing items imputed due to item non-response for the Conditions to Flow Scale, Flow Scale, UWES-9, DASS 21 (Depression Scale), Emotional Well-Being Scale, Scales of Psychological Well-Being, Social Well-Being Scales, World Health

Organisation's Health and Work Performance Questionnaire, and the turnover intentions scale 145

Table 7.5: Attenuated and Disattenuated Pearson's Product-Moment Correlations of the UWES-9 With the Flow Subscales and Flow Scale (*N* = 590) 148

Table 7.6: CFA of Three Competing Models of the Conditions to Flow Scale (*N* = 419) 156

Table 7.7: Completely Standardised Factor Solutions of the Comparative Conditions to Flow Scale Models: Unrestricted Model (Model 1a), Four Factor Restricted Model (Model 2a), and Nested Global and Restricted Four Factor Model (Model 3a; *N* = 419) 156

Table 7.8: CFA of Three Competing Models of the Flow Scale (N = 419) 159

Table 7.9: Completely Standardised Factor Solutions of the Comparative Flow Scale Models: Unrestricted Model (Model 1b), Five Factor Restricted Model (Model 2b), and Nested Global and Restricted Five Factor Model (Model 3b modified; *N* = 419) 160

Table 8.1: CFAs Confirming the Unidimensionality of the Mental Health and Work Involvement Latent Variables 175

Table 8.2: Means, Standard Deviations, Cronbach's alpha Coefficients, and Intercorrelations of Scales in Model (N = 572) 177

Table 8.3: Model fit Indices of the Specified Full Meditational (Model 1) and Partial Mediation Model (Model 2; N = 572) 177

Table 8.4: Standardised Direct, Indirect, and Total Effects on Flow, Mental Health, and Work Involvement (N = 572) 180

List of Figures

Figure 7.1: Competing models tested for both the Conditions to Flow and Flow Scales 152

Figure 7.2: Nested model – Conditions to Flow Scale 157

Figure 7.3: Nested model – Flow Scale 161

Figure 8.1: Proposed full meditational (Model 1) and partial mediation model (Model 2) 173

Figure 8.2: Unrestricted single global factor model for mental health (MH) 175

Figure 8.3: Unrestricted single global factor model for work involvement (WI) 176

Figure 8.4: Partial mediation model 179

List of Appendices

Appendix A-1: Originally Developed Conditions to Flow and Flow Scales 225

Appendix A-2: Demographic Questions – Study 1 228

Appendix A-3: Ethics Approval – Study 1 229

Appendix A-4: Participant Information Sheet – Study 1 231

Appendix A-5: Initial EFA Scree Plot – Original Conditions to Flow Scale 233

Appendix A-6: Revised EFA Scree Plot – Original Conditions to Flow Scale 234

Appendix A-7: Initial EFA Scree Plot – Original Flow Scale 235

Appendix A-8: Revised EFA Scree Plot – Original Flow Scale 236

Appendix A-9: Revised Conditions to Flow and Flow Scales 237

Appendix A-10: Demographic Questions – Studies 2, 3, and 4 240

Appendix A-11: Ethics Amendment Approval Letter – Study 2 241

Appendix A-12: Initial EFA Scree Plot – Revised Conditions to Flow Scale 242

Appendix A-13: Revised EFA Scree Plot – Revised Conditions to Flow Scale 243

Appendix A-14: Higher-Order FA Scree Plot – Revised Conditions to Flow Scale 244

Appendix A-15: Initial EFA Scree Plot – Revised Flow Scale 245

Appendix A-16: Revised EFA Scree Plot – Revised Flow Scale 246

Appendix A-17: Higher-Order FA Scree Plot – Revised Flow Scale 247

Appendix A-18: Conditions to Flow and Flow Scales 248

Appendix A-19: Balanced Inventory of Desirable Responding (BIDR) 250

Appendix A-20: Ethics Approval – Study 3 252

Appendix A-21: Participant Information Sheet – Study 3 253

Appendix A-22: Ethics Approval – Studies 4, 5, and 6 256

Appendix A-23: Brief Company Report for Company A 257

Appendix A-24: Brief Company Report for Company B 274

Appendix A-25: Participant Information Sheet – Studies 4, 5, and 6 291

Appendix A-26: Utrecht Work Engagement Scale (UWES-9) 294

Appendix A-27: Depression Anxiety Stress Scales 21 (DASS 21) 295

Appendix A-28: Emotional Well-Being Scale 297

Appendix A-29: Scales of Psychological Well-Being 298

Appendix A-30: Social Well-Being Scales 301

Appendix A-31: Absenteeism and Presenteeism questions from the World Health Organisation's Health and Work Performance Questionnaire (WHO HPQ) 302

Appendix A-32: Turnover Intentions Scale 303

List of Abbreviations

ABS	absenteeism
ANOVA	analysis of variance
ANX	anxiety
ANZSCO	Australian and New Zealand Standard Classification of Occupations
BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
BIC	Bayesian information criteria
BIDR	Balanced Inventory of Desirable Responding
CDN	Conditions to Flow
CESD	Centre for Epidemiological Studies Depression Scale
CET	cognitive evaluation theory
CFA	confirmatory factor analysis
CFI	comparative fit index
CHL	Appropriate Challenge
CON	Deep Concentration
CTL	Control
DASS ANX	DASS Anxiety Scale
DASS DEP	DASS Depression Scale
DASS STRS	DASS Stress Scale
DASS	Depression Anxiety Stress Scales
DEP	depression
DFS-2	Dispositional Flow Scale-2
DSM	Diagnostic and Statistical Manual of Mental Disorders
EFA	exploratory factor analysis
ESF	experience sampling form
ESM	experience sampling method
EV	eigenvalue
FBK	Feedback
FLW	Flow
FSS-2	Flow State Scale-2
GLS	Clear Goals

GST	goal setting theory
HREC	Human Research Ethics Committee
IM	Impression Management subscale
JCM	job characteristics model
JD-R	job demands resources model
JP	job performance
KMO	Kaiser-Meyer-Olkin
LOS	Loss of Self-Consciousness
LSAT	life satisfaction
MAA	Merging of Action and Awareness
MANOVA	multivariate analysis of variance
MAR	missing at random
MCAR	missing completely at random
MI	multiple imputation
ML	maximum likelihood
NEG	Negatively Keyed Item factor
NIMH	National Institute of Mental Health
NMAR	not missing at random
MODAS	Modified Tellegen Absorption Scale
N-PEP	non-peak experience performance
OIT	organismic integration theory
ORD	Order in Consciousness
PA	positive affect
PANAS	Positive and Negative Affect Schedule
PEP	peak experience performance
PGTH	personal growth
PMS	person mean substitution
POB	positive organisational behaviour
POS	positive organisational scholarship
PPIs	positive psychology interventions
PRF	Personality Research Form
RMSEA	root mean-square error of approximation
SDP	Self-Deceptive Positivity subscale

SDR	Social Desirable Responding Scale
SDT	self-determination theory
SE	self-esteem
SEM	structural equation modelling
SLS	Schmid-Leiman solution
SMCs	squared multiple correlations
SRMR	standardised root mean square residual
STRS	stress
TAS	Tellegen Absorption Scale
TLI	Tucker-Lewis index
TMT	Terror management theory
TO	turnover intentions
TOT	Transformation of Time
UNI	Uninterpretable factor
UWES-9	Utrecht Work Engagement Scale
WHO HPQ	World Health Organisation's Health and Work Performance Questionnaire
WOLF	Work-Related Flow Inventory

Abstract

Aims

Currently available methods for assessing flow at work do not assess the true experiential state of flow; are confounded with antecedents or outcomes of flow; have issues with reliability; or have little to no established evidence of validity. In the absence of a conceptually appropriate, reliable, and valid scale that measures the flow experience, the present thesis aimed to: appropriately classify all the dimensions found in flow theory into antecedents, the experiential state, or outcomes of flow; develop a measure of the conditions to flow, and a measure of the flow state or experience using currently recommended guidelines in scale development; and provide evidence of reliability and validity for both the developed scales. This research also aimed to identify possible antecedents and positive outcomes of experiencing flow at work for both individuals and organisations.

Scope

In the development of the two scales, exploratory factor analysis (EFA) on responses from a convenience sample of 243 respondents revealed a four factor solution for the Conditions to Flow Scale which captured the proposed conditions to flow (i.e., Appropriate Challenge, Clear Goals, Feedback, and Control). However, the two factors Appropriate Challenge and Feedback were found to have unacceptably low internal consistency. EFA revealed a three factor solution for the Flow Scale including two factors representing the known dimensions of flow (i.e., Transformation of Time and Deep Concentration) and a third factor that was interpreted as an "Order in Consciousness" factor, however, it was found to have poor internal consistency. Based on these findings a series of revisions were made to improve the psychometric properties of the scales to better capture all the dimensions. EFA, using a convenience sample of 333 respondents, revealed that the revised scales demonstrated substantially improved internal consistency. Each intended dimension was represented by a single factor with the exception of the deep concentration dimension, which revealed that items loaded on two independent factors (i.e., Deep Concentration and Order in Consciousness). A higher-order FA revealed the presence of global factors for the Conditions to Flow Scale and the Flow Scale; both global factors were found to be highly internally consistent.

Using a convenience sample of 314 respondents, evidence of known group validity was established by comparing two occupational groups known to differ in the amount of flow experienced (high-flow versus low-flow occupational groups). It was found that employees in the high-flow group reported both more experience of the conditions responsible for flow and more flow than employees in low-flow group. Furthermore, using the same sample, evidence of discriminant validity was established as there were no large associations found between the Conditions to Flow Scale or the Flow Scale and Social Desirable Responding. This suggests that employees are not inclined to adjust or construe their responses in a more positive way as determined by society.

Responses from a convenience sample of 590 respondents, revealed evidence of convergent validity as a large correlation was found between employee engagement and flow. Additionally, using the same sample, confirmatory factor analyses (CFAs) provided evidence for factorial validity by testing a series of progressively more complex models. As found with the previous EFAs, CFA results revealed that the Conditions to Flow Scale and Flow Scale were each best represented by a single global factor comprising four (Appropriate Challenge, Clear Goals, Feedback and Control), and five (Order in Consciousness, Loss of Self-Consciousness, Transformation of Time, Deep Concentration, and Merging of Action and Awareness) narrow factors, respectively. Responses from the same sample of 590 respondents was subjected to structural equation modelling (SEM), and revealed that the conditions to flow (Appropriate Challenge, Clear Goals, Feedback, and Control) were found to be statistically significant predictors of flow, mental health, and work involvement.

Conclusions

There are two main outcomes of this thesis. First, the development and validation of psychometrically sound measures that assess the conditions to flow and the flow experience at work. Second, this research has identified some of the positive outcomes of experiencing the conditions to flow at work for individuals and organisations. The research limitations, implications, and directions for future research are discussed.

Chapter 1

Overview

1.1 Introduction

The positive psychology movement aims to change psychology's preoccupation with the negative aspects of life to also include an understanding of the positive aspects of life (Linley, Joseph, Harrington, & Wood, 2006). Current treatments that aim to reduce mental illness symptoms do not necessarily result in an individual that is mentally healthy – functioning well psychologically, emotionally, and socially (Riskind, Sarampote, & Mercier, 1996; Snyder & McCullough, 2000). It is argued that more research is needed to better understand how to make lives more productive and fulfilling, and to identify and nurture high talent. Through nurturing human strengths, it may be possible to prevent the onset of mental illness, create flourishing individuals, and prevent mental illness relapse (Seligman, 2002).

Flow theory is an understanding of experiences that represent peoples' lives at their fullest (Csikszentmihalyi, 1988b, 2002). The flow experience has been described as a positive experiential state that involves full concentration on the activity at hand, where distractions are absent, actions and awareness merge, the passage of time is perceived to be distorted, a sense of control is experienced, and the activity is performed for its own sake, rather than for any external reward (Nakamura & Csikszentmihalyi, 2009). Flow theory has the potential to be widely applicable, however, the work domain where much of our adult life is spent, is a domain where it may be most beneficial (Csikszentmihalyi, 1975). This is because flow, which is related to intrinsic motivation and peak performance, is likely to have many benefits for both individuals and organisations.

Currently, despite the potential benefits of flow in the workplace, there is no known suitable measure of the flow experience at work. Specifically, no measure has demonstrated adequate assessment of the flow experience without the inclusion of confounding variables. This is because there has been a lack of rigorous scale development and psychometric testing of flow measures, resulting in limited evidence of reliability and validity.

1.2 Aims

The present thesis aimed to address the above issues by: classifying the dimensions of flow theory into antecedents, the experienced state, and the outcome of flow using a critical review of the available literature; developing measures of the conditions to flow, and of the flow state using current recommended guidelines in scale development (DeVellis, 2003); and providing evidence for the reliability and validity for both scales. Additionally, unrelated to the above measurement issues, the present thesis also aimed to examine the antecedents and some of the outcomes of experiencing flow at work for individuals and organisations.

1.3 Presentation of Chapters

In Chapter 2, flow is located in the broader context of the positive psychology movement and an argument is made for the need to look at positive psychology concepts such as flow. Chapter 3 provides a critical review of flow theory; it details its various applications, and provides a justification as to how the application of flow theory, particularly in the workplace, may address the forgotten aims of psychology. Chapter 4 details how flow can be suitably applied to the workplace. In addition, this chapter reviews theories of work motivation and related concepts (e.g., employee engagement and self-determination theory), highlighting similarities to flow and the unique contributions flow can bring to the workplace. Chapter 5 reviews the current methods available for assessing the flow experience at work, focussing on key issues of the available measures. Chapter 6 provides a rationale for reconceptualising the dimensions proposed in flow theory into antecedents, the experienced state, and the outcome of flow. Chapter 6 also details and examines the development of two scales that aim to measure the conditions to flow, and flow state. Chapter 7 provides evidence for known-group, discriminant, convergent, and factorial validity of the revised scales. Chapter 8 examines the antecedents and some of the positive outcomes of experiencing flow at work for employees and organisations. Lastly, Chapter 9 reviews the findings of the present research, and discusses the limitations, implications, major contributions and directions for future research.

Chapter 2

The Need for Positive Psychology

2.1 Overview

While this research examines the application of flow theory in the workplace, flow theory forms part of the positive psychology movement and therefore, it is considered important to firstly locate this research in the broader context of this movement. In this chapter a justification is provided for the need for positive psychology. This chapter concludes by discussing the aims and contributions of positive psychology, arguing that it is time to shift our focus from treatment to prevention, and to develop a new science and understanding of positive constructs, such as flow.

2.2 A Brief History of Western Psychology

Before World War II, the main aims of psychology were to identify, classify, and cure mental illness; to create lives that were more productive and fulfilling; and to identify and nurture high talent (Linley et al., 2006). Clinical psychologists, adopting the first of these aims, developed a view of people through the disease model (Maddux, 2002), which was consistent with their training, much of which occurred in psychiatric hospitals under the supervision of medical practitioners and psychoanalytically trained psychiatrists (Maddux, 2002). In addition, during World War II, the National Institute of Mental Health (NIMH; which is largely based on the disease model from the American Psychiatric Association) was also providing funding to those who chose to conduct research centred around pathology, which led to an expansion of research into pathology as funds were made available to psychologists (Seligman, 2002). The consequence of these historical forces shaped psychology, focusing the discipline of the time and into the future primarily on the assessment and treatment of mental illness. Since World War II, there has been an explosion of research into psychological disorders, which has had many positive consequences for individuals and society, more generally.

2.3 Issues and Limitations of Accomplishments

Despite the significant advances of psychology in the identification, diagnosis and treatment of mental disorders, there are clear limitations to the approach of clinical psychology. Key issues are discussed below.

2.3.1 Effectiveness.

Despite meta-analyses and field study data providing evidence of treatment efficacy (Ackerman & Greenland, 2002; I. M. Anderson & Tomenson, 1994; A. Bakker, Van Balkom, & Spinhoven, 2002; Blanco et al., 2003; Boyer, 1995; Eddy, Dutra, Bradley, & Westen, 2004; Fedoroff & Taylor, 2001; Joffe, Sokolov, & Streiner, 1996; Kasper, Fuger, & Moller, 1992; Lipsey & Wilson, 1993; Mitte, 2005; Mitte, Noack, Steil, & Hautzinger, 2005; Seligman, 1995; Shapiro & Shaprio, 1982; Smith & Glass, 1977; Song et al., 1993; Stein, Ipser, & Seedat, 2006; Stein, Spadaccini, & Hollander, 1995), a number of studies have found that many people do not benefit from treatment, or fail to remain in remission long-term. For example, in the treatment of depression, many fail to respond to drug treatments, and for those that do, relief from depressive symptoms is often short lived or only partial (O'Reardon, Brunswick, & Amsterdam, 2000). In clinical trials, it has been found that up to 30% of participants do not respond to antidepressant medication (Joffe et al., 1996; O'Reardon & Amsterdam, 1998) and of those who do respond, only 30% remain in remission at study completion (O'Reardon & Amsterdam, 1998). For the treatment of major depressive disorder, remission rates for cognitive behavioural therapy and interpersonal therapy (both 16 weeks of treatment) at study completion were only 30% and 26%, respectively, and the rate of relapse after recovery (8 weeks post-treatment with either no or minimal symptoms) was 36% and 33%, respectively (Shea et al., 1992). Similarly, in the treatment of anxiety-related disorders, a large number of patients fail to respond to first line treatments. For example, up to 60% of patients with obsessive-compulsive disorder (Pallanti et al., 2002), and up to 40% of patients with panic disorder failed to respond to pharmacotherapy (Bandelow & Ruther, 2004). For generalised anxiety disorder, 12 weeks of cognitive behavioural therapy resulted in only 32% of the sample recovering, and 12 weeks of behavioural therapy resulted in only 16% of the sample recovering (scoring within the normative ranges on the Beck Anxiety Inventory, Hamiltion Anxiety Scale and Leeds Anxiety Scale; Butler, Fennell, Robson, & Gelder, 1991).

As the above reviewed research on the effectiveness of clinical psychological treatments suggests, there are some issues with current approaches to the treatment of mental disorders. Positive psychologists claim that these treatments differ from treatments for other illnesses, in that they only reduce symptoms rather than cure illness (complete and permanent remission); for example, “All current medical treatments for mental illnesses are palliative, none are even proposed as cures” (Insel & Scolnick, 2006, p. 3).

2.3.2 Validation.

The evaluation of pharmacotherapy and psychotherapy, first-line treatments for common mental disorders, has been largely achieved through the use of efficacy studies (Seligman, 1995), which have limited generalisability to real world settings (U.S. Department of Health and Human Services, 1999). This is because in addition to using highly selective samples of people (e.g., often excluding children, elderly, and those with comorbidity; U.S. Department of Health and Human Services, 1999) these studies are affected by a willingness to participate in a clinical trial, strict inclusion/exclusion criteria (i.e., single diagnosis disorder – not often the case in practice), and drop-out rates. Therefore, participant samples in these studies do not necessarily represent the range of individuals with mental illness in the general population (Munoz, Hollon, McGrath, Rehm, & VandenBos, 1994).

A further issue compromising the validity of studies examining the efficacy of first-line treatments for mental disorders is that efficacy studies typically adhere to structured, illness specific, and manualised therapies. This practice stands in contrast to normal practice where the number of sessions and material covered is largely modified to suit each individual client (Seligman, 1995). Additionally, despite similar training and use of manualised therapies, therapist variability still exists and is not accounted for in the majority outcome studies (Garfield, 1996). Taken together, the above issues challenge the generalisability of findings from efficacy studies. To assume these findings can be replicated in practice would be taking a sizeable leap (Munoz et al., 1994).

2.3.3 Help seeking and compliance Issues.

Despite current treatments and diagnosis for mental disorders, many people still go undiagnosed or seek treatment. An Australian study found that General Practitioners failed to recognise mental disorders in 56% of their patients (Hickie et al., 2001). In a recent Australian Bureau of Statistics survey of mental disorders, it was revealed that only 35% of the 3.2 million Australians with a 12 month mental disorder, accessed services for mental health problems (Australian Bureau of Statistics, 2007). When asked about prior experience with mental disorder, individuals have reported a large delay (m = 8.2 years) in seeking help for mental health problems (Thompson, Issakidis, & Hunt, 2008).

In an Australian clinical sample, a common reason (60%) for not seeking help was a lack of knowledge about mental illness and available treatment options (Thompson, Hunt, & Issakidis, 2004). Another plausible reason found in help-seeking behaviour research, which is often ignored, is that for some, mental illness is likely seen as a normal reaction to their environment and when such a reaction is justified as normal, one does not seek support (Keyes, 2007b).

Even for the 35% with a mental disorder who do seek help (Australian Bureau of Statistics, 2007), there is still a large number who do not complete the full course of treatment, often miss appointments, or don't take medications consistently, as prescribed (Kessler et al., 2001; A. J. Mitchell & Selmes, 2007; Wang, 2007; Wierzbicki & Pekarik, 1993). This represents a significant problem in terms of the effectiveness of these treatments.

2.3.4 Inappropriate classification of normal and abnormal.

The DSM, arguably one of the most powerful books in psychiatry and clinical psychology, provides numerous categories of mental disorders with criteria for distinguishing between normal and abnormal psychological functioning. However, contemporary researchers, theoreticians, and emerging research now suggest that normality and abnormality lie along a continuum, and that there are large individual differences on psychological dimensions. Thus, it is not appropriate to simply classify people into either normal or abnormal categories (Maddux, 2002).

2.3.5 Do psychological disorders actually exist and are we overpathologised?

Operating from the disease model has led to the belief that mental disorders actually exist. However, unlike viruses, which are discovered and have properties, mental disorders were "invented" (Maddux, 2002). Maddux (2002) suggests that mental disorders are not facts about people, but rather abstract concepts representing arbitrary and socially constructed categories. It has also been said that the stage of overpathologisation has been reached. Since 1952, the number of mental disorders has increased nearly threefold, from 106 to 297 (Maddux, 2002). As the development of the DSM is atheoretical, it is foreseeable that human behaviour not seen as being logical, adaptive, or efficient may potentially represent a mental disorder (Maddux, 2002). Examples of this are evident in the considerations for new DSM versions (i.e., internet addiction and road rage).

2.4 Future Direction – Positive Psychology

Despite the above considerations, it is clear that mental disorder is still considered a problem today. However, while some recognise that "the science of mental illness has produced effective treatments for more 'broken-down' people, it remains ineffective for preventing more people from 'breaking down'" (Keyes & Lopez, 2002, p. 46). Psychologists still have little knowledge about what makes life worth living (Seligman & Csikszentmihalyi, 2000). Additionally, researchers suggest that psychotherapies that do reduce mental illness symptoms, do not lead to optimal/flourishing individuals (Riskind et al., 1996; Snyder & McCullough, 2000) and are likely only the first step in treatment (Ramana et al., 1995).

A relatively new branch of psychology, positive psychology, focuses on prevention of mental illness by focussing on the identification and building of human strengths. Advocates of positive psychology suggest that even “normal” people require advice and guidance to flourish in life (Seligman & Csikszentmihalyi, 2000). Positive psychologists also argue that we need to “redress the imbalance in psychological research and practice by calling attention to the positive aspects of human functioning and experience” (Linley et al., 2006, p. 8). It is hoped that this positive psychology movement will broaden our focus to an understanding of making people stronger (resilient) and increasing human potential (flourishing in life; Seligman, 2002).

2.4.1 Positive psychology’s contributions.

Mental health has been viewed as simply the absence of mental illness (Keyes & Lopez, 2002; Westerhof & Keyes, 2010). It is assumed that by treating mental illness, and preventing the onset of mental illness, this will result in a society that is mentally healthier (Keyes, 2007a). However, positive psychologists argue that mental health should not simply be seen as the absence of mental illness, but should also incorporate the presence of well-being (Keyes, 2002; Keyes & Lopez, 2002). Well-being is suggested to be a multidimensional phenomenon that includes both *hedonic* and *eudaimonic* dimensions (Keyes, 2006; Ryan & Deci, 2001). Hedonic well-being, which is likened to happiness, refers to high levels of positive affect, low levels of negative affect, and high levels of life satisfaction. Eudaimonic well-being, refers to optimal functioning in life (Ryan & Deci, 2001).

To illustrate a more complete picture of the human experience, Keyes (2005b; 2002) has proposed a revised model of mental health – the two continua model of mental illness and health. This model suggests that there are two dimensions, one of mental illness and the other mental health, which both have complete and incomplete states (Keyes, 2005b; Keyes & Lopez, 2002). In relation to the mental health dimension, also known as the mental health continuum model, individuals can be categorised into one of three well-being states (*flourishing, languishing,* and *moderate mental health)* based on the presence or absence of both eudaimonic (psychological and social) and hedonic (emotional) well-being symptoms. Flourishing, also referred to as complete mental health, represents high levels of eudaimonic well-being and high levels of hedonic well-being (Keyes, 2002). Individuals who are flourishing, not only feel good about life but are also functioning well (Keyes & Annas, 2009). Languishing, also referred to as incomplete mental health, represents low levels of both eudaimonic and hedonic well-being (Keyes, 2002). Individuals who are languishing, have few good feelings about life and don't believe they are functioning well (Keyes & Annas, 2009). Moderate mental health, represents those who are neither flourishing nor languishing (Keyes, 2002), they possess either moderate levels of both hedonic and eudaimonic well-being or have opposing levels of each (i.e., high hedonic and low eudaimonic or vice a versa; Keyes & Annas, 2009). Empirical findings provide support for the mental health continuum model, in that mental health (i.e., flourishing) should represent both positive feelings (hedonic) and positive functioning (eudaimonic) in life (Keyes, Myers, & Kendler, 2010).

Empirical findings also support the hypothesis that mental health and mental illness are two distinct dimensions. Confirmatory factor analysis has revealed that the correlation between the latent factors of mental health and mental illness was -.53, suggesting that the two concepts are related to some degree, but are not a singular construct (Provencher & Keyes, 2011). The two continua model has been validated among adult (Keyes, 2005b; Westerhof & Keyes, 2010) and adolescent samples (Keyes, 2009). The important distinction between mental illness and mental health highlights the need to not only reduce mental illness but also improve mental health (Slade, 2010). As Keyes (2007a) suggested, "curing or eradicating mental illness will not guarantee a mentally healthy population" (p. 95).

Field study data in the U.S. show that functioning below a state of flourishing is associated with psychosocial impairment (i.e., poor emotional health, reduced ability to perform everyday tasks, lost work hours; Keyes, 2002, 2003, 2005b); helplessness, unclear goals, low resilience and intimacy (Keyes, 2005b); cardiovascular disease (Keyes, 2004); chronic physical illness (Keyes, 2005a); lower engagement at work (thought and effort); more work injuries; more medical visits; and more medication (prescription) usage (Keyes & Grzywacz, 2005). However, only 20% of the U.S adult population are considered flourishing in life (Keyes, 2002, 2003, 2004, 2005a, 2005b). Moreover, languishing adults were not found to function any better than those with depression, with some functioning less well (Keyes, 2006), further highlighting the importance of improving mental health.

Central to positive psychology are the hypotheses that (a) increasing mental health will shift our society further away from the risk of future mental illness, and (b) the absence of mental health will increase the risk of future mental illness. Findings from research conducted by Keyes, Dhingra, and Simoes (2010), provide evidence for both these hypotheses. Data from the Midlife in the United States Surveys in 1995 and 2005 (*N* = 1723) revealed that mental health decreased the likelihood of mental illness and the absence of mental health increased the likelihood of mental illness. In terms of the predictors of future mental illness, moderate mental health was also found to be nearly as good a predictor as past mental illness, and languishing was found to be a stronger predictor of mental illness (Keyes, Dhingra et al., 2010).

Positive psychologists have suggested that there are a number of human strengths that buffer against mental illness, some examples include: courage, optimism, faith, hope, and flow (Seligman, 2002). It is argued that more research is needed to better understand these human strengths and learn how to enhance them. A number of promising positive psychology interventions (PPIs) have been developed with the aim to enhance human strengths. PPIs are seen as “treatment methods or intentional activities that aim to cultivate positive feelings, behaviours, or cognitions” (Sin & Lyubomirsky, 2009, p. 468). A meta-analysis of 51 different PPIs, using a sample of 4,266 individuals, revealed that PPIs significantly enhanced well-being and decreased depressive symptoms (Sin & Lyubomirsky, 2009). Given that positive psychology is an emerging field, it is suggested that this first wave of interventions will only pave the way for yet more effective interventions in the future (Vella-Brodrick, 2011).

2.4.1.1 Positive organisational movement.

Mainstream psychology is not the only field that has largely focused on illness and dysfunction. Industrial/organisational research has devoted substantial research to the negative aspects of organisational life (Luthans & Church, 2002; Schaufeli & Bakker, 2004; Wright, 2003). For example, Schaufeli and Bakker (2004) found that 90% of articles in the Journal of Occupational Health Psychology focus on cardiovascular disease, work accidents, burnout, workplace violence, bullying, and substance abuse. While this research has promoted a greater understanding of concepts such as job burnout, psychological distress, job dissatisfaction, and employee hypertension (Wright & Quick, 2009), it has done little to enhance the positive aspects of work. It is argued that organisational research should adopt a more “holistic” approach that includes the study of both the presence and absence of negative and positive aspects of organisational life (Wright & Quick, 2009)

In an increasingly competitive and level playing field, organisations require higher than average performance to survive and succeed (Avolio & Luthans, 2006; Sutcliffe & Vogus, 2003). In such a world, success is unlikely to be obtained by just trying to fix weakness. Success today requires an understanding of the positive aspects of organisational life, enhancing performance, and the processes that facilitate it (Luthans & Youssef, 2007). Recognising the positive psychology movement in mainstream psychology, several approaches to better understand the positive aspects of organisational life have emerged: Positive organisational behaviour and positive organisational scholarship (Luthans & Youssef, 2007).

2.4.1.1.1 Positive organisational behaviour.

In 2002, Luthans and Church (2002) proposed a new approach to organisational behaviour research called *positive organisational behaviour (POB);* defined as, "the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today's workplace" (p. 59). From this definition it may appear that many existing constructs in the organisational field could fit under this POB umbrella. However, there are several criteria that have to be met in order for a concept to be considered a POB (Luthans & Church, 2002). First, the concept must be theoretically and empirically driven and measureable. This criterion was specified to distinguish POB concepts from common positively orientated concepts that appear in motivational best-sellers, which are not typically theoretical/research driven, such as, Who Moved my Cheese and The One Minute Manager, both by Spencer Johnson (Luthans & Church, 2002). The second criterion is that a POB concept should be related to performance which distinguishes POB concepts from personal development concepts such as, compassion, virtue, and forgiveness (Luthans, 2002). The third criterion is that POB concepts should be state-like and therefore human resource strengths and psychological capacities that can be learnt, developed, and changed (Luthans, 2002). Concepts that meet the POB inclusion criteria are: self-efficacy, hope, optimism, and resiliency (Luthans, Youssef, & Avolio, 2007).

2.4.1.1.2 Positive organisational scholarship.

Positive Organisational Scholarship (POS) is the study of the conditions and processes that are responsible for employee optimal functioning at the many levels within an organisational context (i.e., individual, unit, and organisation; Youssef & Luthans, 2009). POS aims to understand the processes that are responsible for human strength, resilience and restoration, vitality, and extraordinary individual and organisational performance (Cameron & Caza, 2003). POS should not be seen as a new field of study as there are many existing constructs in organisational behaviour research that can be considered POS, such as creativity, engagement, and flow (Youssef &

Luthans, 2009). POS aims to unite existing concepts that focus on optimal human functioning to undertake a rigorous and systematic investigation of positive organisational phenomena (Cameron & Caza, 2003).

2.5 Conclusion

This chapter reviews a historical trend of focussing on negative aspects of human functioning. This review suggests that, despite significant advances in psychological understandings of negative aspects of human functioning, there is a need to relook at psychology's direction and to dedicate research to the more positive aspects of human functioning. Specifically, we need to look not at just curing mental illness, but also focus on making people's lives more productive, fulfilling, and to identify and nurture high talent. There is a need to conduct research that identifies and builds human strengths, such as hope, optimism, and flow. It is argued that through identifying and building these human strengths, we can prevent the onset of mental illness and also create flourishing individuals. In doing so, it may be possible to enhance the experience of individuals' lives, and in the context of the workplace, improve many key outcomes including employee well-being and performance.

Chapter 3
Flow

3.1 Overview

This chapter provides a critical review of the literature on flow theory. More specifically, the chapter reviews flow theory's, origins, characteristics, consequences, and practical applications. Next, other similar constructs are reviewed highlighting their similarities and differences. Lastly, this chapter concludes with an argument that flow theory is a suitable theoretical framework for investigating positive experiences, and highlights its potential importance in the workplace.

3.2 Origins of Flow

The experience that is now known as flow was first noticed among male artists. During Csikszentmihalyi's (1965) doctoral research he noticed that artists spent endless hours painting and sculpting, during which they were completely immersed in the activity at hand. However, once finished, the artists quickly forgot about their paintings, stacking them alongside other previously forgotten pieces of work. There were very few external rewards for artists, few expected to become rich or famous and, due to the observed lack of regard for their paintings once finished, it was clear that the end result of the painting was not a motivating factor. With no external rewards, Csikszentmihalyi (1988b) was curious to understand why these artists experienced such deep involvement when painting.

Psychology's explanation for the intense and engrossing behaviour observed by Csikzentmihalyi was likened to some form of *sublimation*, suggesting that this behaviour was a socially acceptable, symbolic expression of repressed instinctual cravings (Csikszentmihalyi, 1988b). However, for Csikszentmihalyi (1988b), this did not explain why artists experienced such a high level of excitement and deep involvement when painting, nor did it explain why artists were continually seeking more complex challenges and constantly perfecting their skills. Despite not knowing the cause of this experience, it was clear that the act of painting had its own autonomous rewards (Csikszentmihalyi, 1988b).

Research into intrinsic motivation found momentum during the 1970s (Csikszentmihalyi, 1988b). Research found that intrinsically motivated behaviour was self-owned, taken more seriously, and enjoyed regardless of extrinsic rewards (e.g., external recognition; deCharms, 1976). However, for Csikszentmihalyi (1988b), intrinsic motivation research seemed limiting as it was predominately based on laboratory research, rather than findings from natural settings, and often involved young children rather than adults. Additionally, there was still little understanding of how intrinsic rewards were experienced and, thus, why intrinsic motivations were rewarding.

In Csikszentmihalyi's quest to better understand what he had observed among artists when painting, he and his students interviewed over 200 people who participated in intrinsically rewarding activities (Csikszentmihalyi, 1988b). These people included amateur athletes, chess masters, rock climbers, dancers, high school basketball players, and composers of music. They were selected because they spent a large amount of their time in strenuous activities, both physically or mentally, and also received little to no recognition for participating in these activities (i.e., money or fame; Csikszentmihalyi, 1988b). From these in depth interviews, it was found that these subjects shared a common experience described as the *autotelic* experience. The term autotelic is derived from the fragments *auto* meaning self and *telic* meaning goal to refer to a self-contained activity (Csikszentmihalyi, 2002). This autotelic label, however, soon became better known as *flow,* for the following reasons: (a) it is less awkward than the previous label; (b) an autotelic activity represents an activity undertaken for its own sake and not for any external rewards, however, flow can also be experienced in activities that have few intrinsic rewards, or activities that have both intrinsic and extrinsic rewards; and (c) interviewees often used the word flow to describe their intrinsically rewarding activities (Csikszentmihalyi, 1975, 1988b). Autotelic experiences, from here on referred to as flow experiences, have been described as a subjective state that involves full concentration on the activity at hand, where distractions are absent, actions and awareness merge, the passage of time is perceived to be distorted, a sense of control is experienced, and the activity is performed for its own sake, rather than for any external reward (Nakamura & Csikszentmihalyi, 2009). Irrespective of activity, flow experiences were found to have a number of common characteristics that differed from typical everyday activities (Csikszentmihalyi, 1975). The identified characteristics are described in detail below.

3.3 Characteristics of Flow

3.3.1 Balance between challenge and skills.

Initially, it was suggested that during the flow experience an activity's perceived level of challenge had to be equal to one's perceived level of skills. It was thought that the flow experience depended on a fine balance between perceived challenges and skills; without this balance, one would be susceptible to experiencing, on the one hand, anxiety (i.e., unmet challenge) and, on the other hand, boredom (i.e., unchallenged skill; Csikszentmihalyi, 1975).

Subsequent flow research did not provide empirical support for the balanced challenges and skills model. For example, balanced low skills and low challenges were not found to result in flow experiences. Based on this finding, this characteristic of flow was later reconsidered and found to occur when there was a balance between challenges and skills, provided challenges were above average for the individual, and he/she had the necessary skills (Massimini & Carli, 1988). Thus, it is the stretching of skills at an appropriate level that results in the flow experience (Nakamura & Csikszentmihalyi, 2002). The balance between low skills and low challenges, previously thought to elicit flow, was found to result in a state of apathy (Massimini & Carli, 1988).

It is important to note that the flow experience is not necessarily dependent on the objective levels of one's skills or the challenges of the task, rather, it is the perception of these that determines whether one will enter into and remain in a state of flow (Csikszentmihalyi, 1975). This characteristic of flow represents flow's dynamic nature, in that flow is not stable or easy to maintain. For example, skill stretching during flow enhances one's skills, therefore, in order for the flow experience to continue, the activity also has to become equally more complex. A novice tennis player will develop better skills after a number of coaching lessons and tournaments and, therefore, will need to play more skilled opponents if he/she is to avoid boredom in future matches (Csikszentmihalyi, 1988a).

3.3.2 Clear goals.

It is difficult for one to get absorbed in an activity if he/she does not know what to do (Csikszentmihalyi, 1988a). Clear goals allow one to decide what action to take and what action not to take. Goals may either be predefined or develop as the activity unfolds. They can also be either created by the individual, such as a music composer writing a song, or determined by the activity itself, such as playing a game of tennis (Csikszentmihalyi, 2002). In normal everyday life, we may often have goals that contradict one another, but when in flow, goals are logically ordered and non-contradictory. A quote from a rock climber explains this characteristic: "I think it's one of the few sorts of activities in which you don't feel you have all sorts of different kinds of demands, often conflicting, upon you..."(Csikszentmihalyi, 1975, p. 46).

3.3.3 Unambiguous feedback.

Feedback is important to determine how one is succeeding in any activity. During the flow experience, feedback is obtained from within the activity and it is this feedback that is used to determine if one is progressing in a particular task. For example, a surgeon knows that the surgery he is performing is going well by the absence of a large amount of blood in an incision, and a climber knows that with each successful step, he is progressing (Csikszentmihalyi, 1997). It is important to identify and receive ongoing feedback that is logically related to the activity at hand (Csikszentmihalyi, 2002). Csikszentmihalyi (1975) suggested that external feedback, such as fame and money, does not need to be present for the flow experience to occur.

3.3.4 Control.

During flow activities, part of the enjoyment experienced is because flow involves a sense of control (Csikszentmihalyi, 1975). It is the potential for control rather than the actuality of having control that is important. For instance, a rock climber may slip and fall, however, when rock climbing and in flow, the climber believes he has the necessary skills to prevent any “subjective” dangers, such as slipping and falling. There are always the “objective” dangers, such as a sudden storm or falling rocks, which are out of one’s control, but with proper preparation the rock climber can avoid many of the possible objective dangers (Csikszentmihalyi, 2002). Flow activities typically have subjective dangers that are perceived as limited (or even eliminated) by having sufficient skills. It is for this reason that rock climbers believe it is safer to rock climb than to cross a busy city street where they perceive a number of objective dangers beyond their control (i.e., taxi drivers, buses etc.; Csikszentmihalyi, 2002). A dancer when interviewed describes this characteristic of flow:

> A strong relaxation and calmness comes over me. I have no worries of failure. What a powerful and warm feeling it is! I want to expand, hug the world. I feel enormous power to effect something of grace and beauty (Csikszentmihalyi, 1975, p. 44).

3.3.5 Deep concentration.

Another common dimension of flow is that of deep concentration, or focusing of attention on a limited stimulus field. During flow, as one knows where to focus their attention and how, he/she is completely focused on the task at hand. In everyday life, concentration is rarely this intense, and we often have psychic energy available to think about our worries and frustrations of everyday life. However, when in flow, there is no psychic energy available for our everyday worries or frustrations. This experience of flow is similar to the concept of vigilant attention (see Robertson & Garavan, 2004), in that attention to a particular task is related to an inhibition of task irrelevant information. However, in the flow experience, it is the challenging nature of the task that is said to facilitate focused attention (Csikszentmihalyi, 2002); whereas for vigilant attention, one's ability to inhibit non-task irrelevant information is said to improve focused attention (Robertson & Garavan, 2004). The following quote from an interview with a professional chess player highlights this characteristic of the flow experience:

> When the game is exciting, I don't seem to hear nothing – the world seems to be cut off from me and all there is to think about is my game. I am less aware of myself and my problems… at times, I see only the positions. I am aware of the spectators only in the beginning, or if they annoy me. If I am busting a much weaker player, I may just think about the events of the day. During a good game, I think over various alternatives to the game – nothing else. Problems are suspended for the duration of the tournament except those that pertain to it. Other people and things seem to have less significance (Csikszentmihalyi, 1975, p. 40).

3.3.6 Transformation of time.

When in a state of flow, our perception of the passage of time is distorted. After the flow experience, most people feel that time has passed faster than normal and during some flow experiences, the opposite is true. In general, it appears that the demands and goals of the activity seem to make the passage of time irrelevant (Csikszentmihalyi, 2002). The perceived passage of time where time passes faster than normal, is consistent with the attentional model of time perception (Thomas & Weaver, 1975). According to this model, temporal duration is determined by counting units of temporal information. During complex tasks, attentional resources are diverted away from the processing of temporal information and attentional resources are used to process information required by the task. The shift in attentional resources away from temporal information processing, results in fewer counts of temporal duration and therefore the duration of time is underestimated (Thomas & Weaver, 1975). A meta-analytic review of 20 experimental studies provides evidence to support this attentional model of time perception (Block & Zakay, 1997). Tse, Intriligator, Rivest, and Cavanagh (2004) also suggest that when one is stimulated by a task, the rate of information processing can be boosted, not just for the task but also for the processing of temporal information. As a result of this, more temporal units are counted which therefore results in moments of time dilation. Evidence to support this suggestion has been found in experiments where it was revealed that when participants were presented with an improbable stimulus (i.e., an arousing stimulus), their reported perception of duration was dilated (Tse et al., 2004). This dilation of time is consistent with flow experiences, in that sometimes during the flow experience; time appears to progress slower than normal. When in flow, a dancer had this to say about the passage of time when interviewed:

> Two things happen. One is that it seems to pass really fast in one sense. After it's passed, it seems to have passed really fast. I see that it's 1.00 in the morning, and I say, "Ah ha just a few minutes ago it was 8:00." But then while I'm dancing… it seems like it's been much longer than maybe it really was (Csikszentmihalyi, 1975, p. 116).

However, there are certain flow activities that require the precise knowledge of time and, consequently the distortion of time is not experienced. For example, runners need to be aware of how many minutes have passed so that they can pace themselves during the race. In this instance, determining the passage of time is a skill that is required, and it is for this reason that the transformation of time may not necessarily be a characteristic found in all flow experiences (Csikszentmihalyi, 2002).

3.3.7 Merging of action and awareness.

During the flow experience as a person's attention is completely absorbed by the activity itself, there are no attentional resources left to process distractions (Csikszentmihalyi, 2002). As a result, a person has no dualistic perspective between action and awareness. In other words, during the flow experience, one does not stop to reflect on the awareness of the activity itself. There is no time or energy available for questions like, "Should I be doing this?" or "What am I doing here?" (Csikszentmihalyi, 1975, p. 38), which are typical of everyday activities. Additionally, the lack of available attentional resources does not allow one to recognise the large amounts of physical or mental energy expended, and as a result, actions feel almost automatic and effortless (Csikszentmihalyi, 2002). The following quote from an interview with a basketball player highlights this merging of action and awareness: "When I get hot in a game… like I said, you don't think about it at all. If you step back and think about why you are so hot, all of sudden you get creamed" (Csikszentmihalyi, 1975, pp. 39-40).

3.3.8 Loss of self-consciousness.

Due to the potential threats or dangers in normal everyday life, we often spend a considerable amount of time focusing on ourselves. Whenever we feel threatened, we bring our interpretation of ourselves into consciousness. This is needed to assess the seriousness of the threat and to determine what course of action is required to avoid danger or harm. However, in a state of flow, there is little available psychic energy (i.e., attentional resources) available to feel threatened, and as a result the concept of our self is removed from our awareness (Csikszentmihalyi, 2002). This loss of self-consciousness does not mean one has lost control or is not aware of their actions. Rather, usually the opposite occurs with an individual becoming more aware of their actions which serve the activity on which they are focussed. For instance, rock climbers often experience awareness of muscular movements that they were previously unaware of (Csikszentmihalyi, 1975). What is lost during flow, however, is the awareness of the concept of "self" (Csikszentmihalyi, 2002). When not consciously thinking about who we are, experiences seem enjoyable and we are better able to connect with our environment. When we forget about ourselves, it also allows us to connect with our environment. An elite cyclist during the Tour De France may feel like the bicycle is an extension of himself, similarly, a tennis player may feel like the racquet he is holding is an extension of his arm (Csikszentmihalyi, 2002). A Japanese motorcycle gang member explains this union with the environment, or loss of self in a greater system of action:

> I understand something, when all of our feelings get tuned up… When running, we are not in complete harmony at the start. But if the run begins going well, all of us, all of us feel for the others. How can I say this? When, when we wag the tail of the band… When our minds become one, become one. At such a time, it's a real pleasure… When all of us become one, I understand something… All of a sudden I realise, 'Oh, we're one' and think, if we speed as fast as we can, it will become a real RUN… When we realise that we become one flesh, it's supreme. When we get high on speed. At such a moment, it's really super (Sato, 1988, p. 113).

3.3.9 Autotelic experience.

When in flow, the activity is rewarding in and of itself (Csikszentmihalyi, 2002). Although this experience is listed as a dimension of flow, it is best seen as a by-product or end result of experiencing flow (Csikszentmihalyi, 1975, 1988a). The following quote taken from an interview with a rock climber, illustrates the autotelic experience of rock climbing: “The mystique of rock climbing is climbing; you get to the top of the rock glad it’s over but really wish it would go forever. The justification of climbing is climbing…” (Csikszentmihalyi, 1975, p. 47).

3.4 Consequences of Flow

3.4.1 Complexity and development.

It is a proposed that, as a consequence of a flow activity the self often becomes more complex. It is reasoned that this complexity occurs as a result of two processes, *integration* of distinct aspects of the self that are brought to order and harmony and *differentiation* of self from others. One feels more “together”, not only in terms of his/her actions but also in relation to his/her surrounding environment. This creates an ideal state of mind for learning new skills as thoughts and actions are harmoniously aligned. At the end of the flow experience, the self also becomes differentiated – a shift towards uniqueness and a separation of oneself from others particularly in terms of more nuanced skills and complexity (Csikszentmihalyi, 2002).

Flow is also an enjoyable experience which leads an individual to want to keep experiencing flow, and it is for this reason that individuals selectively seek out more progressively difficult challenges, which provide an opportunity for the individual to continue to develop (Nakamura & Csikszentmihalyi, 2002). Interestingly, flow activities typically allow for development, as they tend to have graded levels of challenge that continue to match a person’s developing skills (Nakamura & Csikszentmihalyi, 2002). Video games provide a good example of a graded challenge: In the game of Tetris, where the player has to rotate and connect falling objects of different shapes to form full rows, the player starts at level one, where the objects fall slowly, but as the player advances through the levels, they get progressively more difficult, and one has to orient and move the blocks at a faster rate than the previous level.

3.4.2 Performance.

There is evidence that flow may lead to improved performance (Demerouti, 2006). Among students, research has revealed a significant positive relationship between the frequency of flow and school achievement (Csikszentmihalyi & Larson, 1984), even after controlling for academic performance measures (Csikszentmihalyi, Rathunde, & Whalen, 1993). In the sporting domain, research has found a significant positive relationship between flow and performance (S. A. Jackson, Thomas, Marsh, & Smethurst, 2001). In music performances, flow was found to be significantly positively related to the quality of group musical compositions as judged by specialists who had experience in the teaching or assessment of music composition (C. Byrne, MacDonald, & Carlton, 2003).

In the workplace, studies show that workers who experience more flow at work, spend more time at work working and being more productive (Csikszentmihalyi, 1978). Demerouti (2006) also found that flow in the workplace was significantly positively related to both in-role and extra-role performance but only for those more Conscientious employees. Similarly, A. B. Bakker (2008) found that the commonly used dimensions of flow (work enjoyment and intrinsic motivation) were significantly positively related to performance. Specifically, it was found that work enjoyment was significantly positively related to in-role performance, while intrinsic motivation was significantly positively related to extra-role performance.

3.4.3 Well-being.

When in flow, one experiences deep involvement, enjoyment, a sense of control, and forgets about their worries and frustrations of everyday life; “life is justified in the present…” (Csikszentmihalyi, 2002, p. 69). As flow activities are enjoyable and perceived to have purpose, experiencing flow as much as possible is said to improve the quality of life (Csikszentmihalyi, 2002).

Empirical evidence among both teenager and adult samples, provide support for the link between flow and various concepts said to resemble well-being. Among both U.S. and Italian teenagers, it was found that when teenagers experience flow, they report above average levels of feeling alert, happy, cheerful, strong, friendly, active, sociable, excited, and satisfied (Carli, Delle Fave, & Massimini, 1988). In a longitudinal study, it was found that teenagers who still experienced flow from engaging in their chosen activity (such as chess or basketball) four years later, reported less anxiety than those who no longer experienced flow from their chosen activity (Csikszentmihalyi et al., 1993). In another study, Rogatko (2009) found that college students assigned to a high-flow activity group had positive affect (PA) scores that improved from pre- to post-activity, while those in the low-flow activity group had PA scores that decreased, illustrating a positive relationship between flow and positive affect.

Fullagar and Kelloway (2009) found that, among architectural students, momentary flow was significantly positively related to future momentary positive mood, however, momentary mood was not found to be related to future momentary flow, suggesting a positive relationship between flow and mood and that flow precedes changes in mood. Clarke and Haworth (1994) found that, among college students, flow was positively related to reported subjective well-being.

In an adult population, Csikszentmihalyi and LeFevre (1989) found that when participants were in flow, they experienced more positive experiences (i.e., happy, creative, and satisfied). Bloch (2002) found that, among employees, flow was positively associated with joy, ecstasy, excitement, happiness, and pride. Similarly, Han (1988) found that among elderly Korean immigrants, flow was positively related to life satisfaction, and Bryce and Haworth (2002) found among office workers that flow was positively related to subjective well-being. Taken together, these findings provide substantial evidence for a significant positive relationship between flow and well-being, and even evidence that suggests that flow can cause PA which is important to well-being.

3.4.4 Self-esteem.

A theory of self-esteem, terror management theory (TMT), suggests that individuals strive to achieve a high level of self-esteem (i.e., a positive evaluation of oneself) to reduce feelings of vulnerability and anxiety about death (Greenberg, 2008). According to TMT, one way in which self-esteem can be enhanced is through the accomplishment of enduring tasks (Greenberg, 2008). Given that flow experiences represent appropriately challenging tasks that are perceived to be manageable, it has been suggested that flow is positively associated with self-esteem (Nakamura & Csikszentmihalyi, 2002; Wells, 1988). Empirical evidence in support of this proposition is demonstrated by the finding that, when experiencing flow (both challenges and skills were high and balanced), self-esteem was found to be higher than when not experiencing flow (i.e., both skills and challenges were low, when challenges were high and skills low, and when challenges were low but skills high; Adlai-Gail, 1994; Wells, 1988).

3.4.5 Addictive nature.

The enjoyable experience of being in flow helps to explain why flow activities can become addictive. Seen as a necessity rather than choice, an addictive activity can interfere with other aspects of life (Csikszentmihalyi, 2002). For example, in the interviews with surgeons, one surgeon mentioned that on his vacation with his wife, the first vacation they had taken together in years, he became so restless that he ended up doing volunteer work at the local hospital for the rest of his holiday (Csikszentmihalyi, 1975). Other surgeons have also suggested that their work is addictive by likening it to “taking narcotics” or “taking heroin”(Csikszentmihalyi, 1975, p. 138).

The flow experience, much like other things in this world, may not always be entirely positive. Flow may be beneficial in enhancing self-development and performance or destructive, by distracting people from other important aspects of their life. Thus, an individual may be compelled to act by the opportunity for flow even when other factors (e.g., legality) should dissuade him or her from such action. Csikszentmihalyi (2002) has suggested that flow theory may provide an explanation for juvenile delinquency. Specifically, youths may turn to delinquency in an attempt to escape from feelings of boredom or anxiety, found in ordinary life (Csikszentmihalyi, 2002). For these reasons, flow is not absolutely good, rather, it can make life more enjoyable, meaningful, and can increase the complexity of oneself while still having negative consequences. Thus, the consequences of flow also need to be taken into account when determining if flow is positive or negative (Csikszentmihalyi, 2002).

3.4.6 Theoretical explanation for the consequences of flow.

A theoretical framework that explains the relationship between flow and some of its positive outcomes is Fredrickson's (1998, 2001) broaden-and-build theory. The broaden-and-build theory was developed as a model to better understand the meaning and function of positive emotions (Fredrickson, 1998). According to this theory, positive emotions, such as joy, interest, contentment, pride, and love, broaden a person's cognitions, and, in turn, action, increasing their thought-action repertoire (Fredrickson, 1998, 2001). In other words, positive emotions allow one to abandon prescriptive behaviour and to engage in novel and creative thought and action (Fredrickson, 1998). This is primarily achieved via the consequent positive emotions of flow.

Positive emotions differ from negative emotions in that negative emotions trigger a momentary narrowed thought-action repertoire that has direct and immediate benefits in life threatening situations (e.g., fear allows one to narrow in on specific behavioural paths that are necessary for survival, such as to escape or attack). In contrast, positive emotions broaden one's thought-action repertoire, which has indirect and long-term benefits including the building of enduring physical, intellectual, social, and psychological personal resources (Fredrickson, 1998, 2001). It is important to note that these personal resources, once acquired, are enduring resources that can be drawn upon at later time and in other emotional states (Fredrickson, 1998, 2001). According to Fredrickson (2001) emotions differ from affect, in that emotions are generally brought upon by a personal meaningful event, either consciously or unconsciously. In contrast, affect, is a broader concept that refers to conscious feelings, which can be present among physical sensations, attitudes, moods, and affective traits. It is important to note this distinction as the broaden-and-build theory focuses on specific positive emotions (i.e., joy, interest, contentment, and love).

The acquisition of enduring resources may explain the link between flow and increased complexity and development (Csikszentmihalyi, 2002; Nakamura & Csikszentmihalyi, 2002). Additionally, the broaden-and-build theory may explain the link between flow and improved performance. Specifically, positive emotions build intellectual resources, which allow people to perform more effectively on tasks (Fredrickson, 1998, 2001). The broaden-and-build theory may also explain the link between flow and well-being. Positive emotions from flow are said to contribute to life satisfaction, reduction in depressive symptoms (Fredrickson & Dutton, 2008), and well-being (Cohn & Fredrickson, 2010). The broaden-and-build theory also suggests a reciprocal relationship between positive emotions and a broadening of cognitions. Thus meaning that, positive emotions broaden one's cognitions and this broadening of cognitions also increases positive emotions. It is suggested that this reciprocal relationship results in a continual increase in well-being over time (Fredrickson, 2001).

3.5 Conditions for Flow

3.5.1 Autotelic personality.

Flow research shows that there are large individual differences in the degree to which flow is experienced by different individuals. For example, a Gallup survey (as cited in Nakamura & Csikszentmihalyi, 2002) found that 42% of Americans rarely or never experience flow, while around 16% experienced flow daily. Additionally, Wells (1988) found that over a one week period, the frequency of flow experienced among a sample of mothers varied from as little 4% to 40% of the reported period. These differences may be due to situational or social factors (e.g., a lack of feedback). However, research has also found differences between individuals who are undertaking comparable tasks. For example, Massimini and Carli (1988) found in a case study that one student almost never experienced flow, while another classmate experienced flow one third of the time.

Very early on, Csikszentmihalyi (1975) acknowledged the possibility of an autotelic personality, described as a person "who is able to enjoy what he is doing regardless of whether he will get external rewards for it" (Csikszentmihalyi, 1975, p. 22). It has been suggested that an autotelic personality consists of several meta-skills that enable one to experience flow more often. These meta-skills include a general curiosity, interest in life, persistence, and low self-centeredness (Nakamura & Csikszentmihalyi, 2002). Similarly, Csikszentmihalyi, Rathunde, and Whalen (1993) and Adlai-Gail (1994) suggest that those with an autotelic personality are more inclined to engage in challenging tasks and subsequently experience more flow than those without an autotelic personality.

The possibility of an autotelic personality suggests that there may be dispositional characteristics that may facilitate the experience of flow. Therefore, the flow experience may have both state (e.g., appropriate challenge, clear goals, control, and feedback) and trait based antecedents. Researchers typically measure autotelic personality simply as the frequency with which one experiences flow (Adlai-Gail, 1994; Hektner, 1996). However, the frequency with which one experiences flow is not a direct dispositional measure, as it also likely reflects the number of opportunities that are conducive to flow (Nakamura & Csikszentmihalyi, 2002). Habitual action-orientation, that is, one's readiness to be deeply involved in an activity, ability to maintain focus, and to persevere (Keller & Bless, 2008), is one dispositional characteristic that has been found to moderate the relationship between a state based antecedent to flow, (i.e., balance between challenge and skill) and flow.

3.5.2 Situational characteristics that predict flow.

In Csikszentmihalyi's (1975) early interviews, he noticed that some of the characteristics of flow were dependent on others. It has since been suggested that the characteristics responsible for flow occurring include: balance between challenges and skills (Keller & Bless, 2008; Massimini & Carli, 1988; Massimini, Csikszentmihalyi, & Massimo, 1987; Rheinberg, Vollmeyer, & Engeser, 2003), having clear goals (Salanova, Bakker, & Llorens, 2006), feedback (Fullagar, Knight, & Sovern, 2012; Nakamura & Csikszentmihalyi, 2002, 2009), and control (Csikszentmihalyi, 1999, 2002). Flow theory suggests that these characteristics differ from the subjective experience of flow as they are related to the task and help to facilitate the flow experience (Csikszentmihalyi & Nakamura, 2010; Nakamura & Csikszentmihalyi, 2002).

In early interviews where the flow experience was first observed, it was noticed that the activities that were conducive to flow, such as making music, rock climbing, dancing, sailing, and chess, shared some common underlying structural characteristics (Csikszentmihalyi, 2002). Specifically, they are challenging activities that require the progressive learning of skills so that one could be continually appropriately challenged during the activity (Csikszentmihalyi, 2002). For instance, those new to rock-climbing would find a low grade climb appropriately challenging and conducive to flow. However, as one's skills improved, he/she could attempt progressively more difficult climbs to maintain an appropriate level of challenge. Another common characteristic of activities that were suggested to be conducive to flow is that of clear goals, which could either be determined prior to the activity or determined as the activity unfolded (Csikszentmihalyi, 2002). For example, the game of chess has clear rules about how chess pieces can be moved and that the aim of the game is to trap an opponent's king piece. Feedback is also another common characteristic typical of flow activities whereby one is aware of how well they are performing. Lastly, the possibility of obtaining control in an activity is considered to be conducive to flow (Csikszentmihalyi, 1999, 2002). Most flow activities allow for the possibility of control, without it, flow is likely to cease as the smooth effortless flow of psychic energy is disrupted by events out of one's control.

Empirical evidence suggests that there are various situational characteristics that may influence the flow experience. Massimini and Carli (1988) and Massimini, Csikszentmihalyi, and Massimo (1987) found that, for flow to occur, there was a need for the adolescent participants to be appropriately challenged. In a longitudinal study, Salanova, Bakker, and Llorens (2006) found that, among teachers, social support, clearly defined goals, and autonomy (innovation orientation) positively related to flow. A. B. Bakker (2005) found that, for music teachers, job resources including autonomy/job control, performance feedback, social support, and supervisor coaching, contributed to the experience of flow. Neilson and Cleal (2010) found that for line managers, control was a predictor of flow. Demerouti (2006) found that, among several occupations, the core job characteristics such as autonomy, skill variety, feedback, task identity, and task significance (e.g.,Hackman & Oldham, 1975), were related to flow. Fullagar and Kelloway (2009) found that for architectural students, skill variety and autonomy were significant and unique predictors of flow. Finally, A. B. Bakker (2008) found that, in a large sample of employees from various occupations (N = 1346), autonomy and opportunities to learn at work were positively related to the flow dimensions of absorption, work enjoyment, and intrinsic motivation.

3.6 Practical Applications of Flow

Despite early criticism of flow as ethereal, almost mystical, and lacking objectivity (Csikszentmihalyi, 1988b), flow theory has been applied to many fields, including leisure, sports, education, and work (Csikszentmihalyi, 2002).The application of flow theory in these different fields is reviewed below.

3.6.1 Leisure, play, and free time.

An important contribution of flow theory is the reconceptualisation of leisure. Flow theory suggests that the quality of an experience may be a more suitable indicator of whether someone is actually at leisure or not. This contrasts traditional views which focused on the context to determine whether one is at leisure (Csikszentmihalyi, 1988b). An interesting consequence of the flow theory perspective on leisure is that work and leisure should not necessarily be seen as opposites, for example, some people enjoy working more than not working (i.e., free time), which blurs the traditional line between work and leisure. Flow theory has no such problem (Csikszentmihalyi, 1988b).

The concept of flow has also been used to gain an understanding of how people experience their free time (Delle Fave & Bassi, 2003). According to Csikszentmihalyi (1997), in contemporary western societies, what one does in their free time has dramatically changed. In the past, free time typically consisted of scientific research, poetry, painting, and musical composition, where people had the opportunity to experiment and develop skills. For example, Gregory Mendel's famous genetic experiments were done as a hobby (Csikszentmihalyi, 1997). However, much of our free time today is largely characterised as relaxation from work or school, rather than pursuing knowledge, curiosity, and creativity (Delle Fave & Bassi, 2003). Survey research reveals that a significant portion of leisure time is spent in passive activities, such as watching television (Delle Fave & Bassi, 2003) and buying and consuming goods (Larson & Verma, 1999). Structured leisure activities, such as sports, games, arts, and hobbies have now been replaced with passive activities, such as watching television and socialising, which create few, if any, opportunities for developing skills (Delle Fave & Bassi, 2003). We assume that this free time, relaxing with nothing to do is most desirable and results in happiness. However, findings show that this assumption is incorrect (Csikszentmihalyi, 1997). Passive leisure activities, have been found to be associated with low mood, low engagement, apathy, and a lack of meaning, personal growth, and flow (Delle Fave & Bassi, 2003). Additionally, it has been found that those who experience boredom during leisure report lower physical and mental health than those engaged in structured leisure activities (Weissinger, 1995).The times in people's lives when they have plenty of free time with nothing to do, such as vacations, holidays, retirement, and even weekends, are often associated with increased mental illness (Csikszentmihalyi, 1997). This finding suggests that we are not suited to be idle.

Structured leisure activities are suggested to be important for personal growth, direction, purpose, and meaning in life (Delle Fave & Bassi, 2003). They have been found to be associated with positive mood, engagement, confidence, intrinsic motivation, flow, and direction in life (Delle Fave & Bassi, 2003). Among American adolescents, it was found using the experience sampling method that, those participating in active games/sports and hobbies reported, three and two and half times, respectively, more flow experiences than when adolescents were watching TV (Csikszentmihalyi, 1997). Similar results have also been found among adults (LeFevre, 1988).

It seems evident that structured leisure activities are more enjoyable and beneficial, however, it has been found that both teenagers and adults spend more time, approximately 400% more time in passive leisure activities (Csikszentmihalyi, 1997). Why is it that people spend the majority of their free time in passive leisure activities, when structured leisure activities offer so much more? One possible reason for this finding is that activities that produce flow often require an initial investment of effort or energy before they become rewarding. For example, when cycling, one may need to pump up tires, change into appropriate cycling clothes, fill up a drink bottle, stretch, and for the more serious cyclist, increase his/her heart rate, all before the activity facilitates flow. If one already feels tired or anxious, he/she may be less inclined to invest energy into an activity requiring this initial investment, preferring a less enjoyable activity, which requires little energy, such as watching TV (Csikszentmihalyi, 1997). It is important to note that passive leisure activities are not necessarily bad; we all need time to unwind. However, what should be of concern is the amount of time spent in passive activities, especially if a person spends the majority or all of their free time in such a state (Csikszentmihalyi, 1997). Although it is possible for leisure activities to be sources of flow, it seems difficult for people to identify meaning and create opportunities for flow in their unstructured free time (Delle Fave & Bassi, 2003). Perhaps this inability to create flow is a result of our over reliance on passive activities (e.g., hugely successful entertainment industry/mass media) and the amount of stimuli that easily attract and may exhaust our attention (e.g. watching sports, DVDs etc; Csikszentmihalyi & LeFevre, 1989).

3.6.2 Sports and physical activity.

The positive experiences or enjoyment derived from engaging in sport, exercise, or physical activity are of interest to many researchers (Csikszentmihalyi, 1975; Wankel, 1993; Wankel & Berger, 1990). Flow theory provides a plausible theoretical framework for explaining the positive effects of physical activity, such as reduced stress, improved psychological health (Wankel, 1993) and improved performance (S. A. Jackson, 1992). For example, in athlete research, subjective experiences are often ignored in both research and practice due to an over-reliance on objective parameters such as behaviour and competitive outcomes. The application of flow theory, however, provides an understanding of these subjective experiences among athletes

(Kimiecik & Stein, 1992), and it has been found that when in a state of flow, not only is the experience improved but also performance (S. A. Jackson, 1992). Thus, as yet, the application of flow theory to sports has a unfulfilled potential (S. A. Jackson, 1995; Kimiecik & Stein, 1992).

3.6.3 Education.

Another area where flow theory is considered potentially useful is education. Csikszentmihalyi (1975) suggested that, while adolescents spend much of their time in education, the typical education system rarely, if at all, rewards or affords adolescents the opportunity to engage in intrinsically rewarding activities (Csikszentmihalyi, 1981). Shernoff and Csikszentmihalyi (2009) suggest that a lack of intrinsic rewarding activities may explain why school work has been found to be associated with apathy and disengagement (Bassi & Delle Fave, 2004; Delespaul, Reis, & DeVries, 2004).

The application of flow theory to the field of education may help to improve students' level of interest and engagement with school work. It has been suggested by flow researchers that interest and engagement can be improved by creating learning environments that are more conducive to flow (Shernoff & Csikszentmihalyi, 2009). For example, Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) found that student engagement was positively associated with tasks that were perceived to be appropriately challenging, contained clear goals, and required active involvement (such as, ability to demonstrate learnt skills) rather than passive involvement (such as, listening to a lecture). Research has found significant positive relationships between flow during school work and reported levels of positive affect (Rogatko, 2009), engagement (Shernoff et al., 2003), and school achievement (Csikszentmihalyi & Larson, 1984), even over and above academic performance measures (Csikszentmihalyi et al., 1993).

3.6.4 Work.

Previously, Organisational Psychology research was primarily concerned with the negative aspects of work, such as stress, bullying, and burnout (Demerouti, 2006; Turner, Barling, & Zacharatos, 2002). However, largely due to positive psychology, research now also examines the positive aspects of work (Turner et al., 2002). This focus on the positive aspects of organisational life has been aided by new topics and approaches, such as positive organisational behaviour and positive organisational scholarship (see section 2.4.1.1 for further information; Luthans & Youssef, 2007).

Flow produces outcomes that are consistent with the aims of occupational health psychology, specifically, to increase the health of employees (Tetrick & Quick, 2003). Flow was discovered in structured leisure activities (e.g., games, sports, and various art forms). This is at odds with the aspects of the work experience which, while structured, are often thought to be inherently hard and unpleasant (Csikszentmihalyi, 1975). However, work does not necessarily have to be hard and unpleasant for it to be productive. Rather, evidence suggests that work can be a source of flow, and in fact it may be easier to experience flow at work than other domains such as leisure (LeFevre, 1988).

The frequency with which flow is experienced at work varies across occupations. For example, traditional farmers experienced flow, on average, 52% of the time, while urban workers experienced substantially less – 5% for clerical workers and 14% for managers (Delle Fave & Massimini, 1988). These findings suggest that modernisation may be responsible for the lack of flow experienced among today's workers. Most western forms of work do not involve production (e.g., manufacturing of cars and household appliances). Rather, in this post-industrial age, work typically involves sitting in front of a computer (Csikszentmihalyi, 2002), which may have limited complexity and relevance compared to that experienced by hunters and traditional farmers. Work now requires the performance of limited and partial tasks, lacks meaningful goals, and often has inflexible challenges (Delle Fave & Massimini, 1988). For many adults, the majority of their time is spent at work and often in a state of either anxiety or boredom (Csikszentmihalyi, 1975). However, flow can still be experienced in more modern forms of work.

In a quest to see if flow existed outside of leisure activities, flow was examined at work among surgeons (Csikszentmihalyi, 1975). Although this activity is quite different from the typical activities in which flow was first observed (e.g., rock climbing and chess), surgery is quite structured, having clear goals, feedback, and requiring a high level of concentration. From interviews with 21 surgeons, it was found that many of the characteristics of flow were experienced by surgeons during their work (Csikszentmihalyi, 1975).

In another study that examined flow in both work and leisure, it was found that flow was experienced 54% of the time at work, while only 17% of the time in leisure (Csikszentmihalyi & LeFevre, 1989). These results were found for individuals from a range of occupations from blue-collar workers to managers, and were not biased towards jobs where flow experiences were most likely anticipated (Csikszentmihalyi & LeFevre, 1989). Findings from this study suggest that it may be easier to experience flow at work than in leisure (Csikszentmihalyi & LeFevre, 1989). A possible explanation for this may be because in leisure, we firstly need to create structured activities, which have clear goals, provide feedback, allow for control, and are appropriately challenging. However, in the work context, these conditions either already exist, or tasks can be restructured to provide them (Csikszentmihalyi, 2002).

The application of flow theory has the potential to make any form of work more enjoyable. The problem is, however, making those who are in a position to create opportunities for flow aware of the benefits of flow. This may mean reorienting managers to think about issues beyond profits and productivity. Such an orientation may be initially disruptive and have a detrimental effect on profits and productivity, however, the small investment required to make work more enjoyable will likely result in large benefits for both the employee and organisation (Csikszentmihalyi, 2002).

Csikszentmihalyi and LeFevre (1989) found that, when in flow, employees from a range of different occupations all scored higher on happiness, strength, concentration, and creativity measures (Csikszentmihalyi & LeFevre, 1989). Studies show that workers who experience more flow at work, not only spend more time at work working and being more productive, but they also tend to enjoy other aspects of their life also (Csikszentmihalyi, 1978). Additionally, based on emotional contagion theory, A. B. Bakker (2005) suggested that flow may even be contagious, based on the finding that flow experienced by music teachers predicted flow among students.

Demerouti (2006) has highlighted the importance of flow in occupational health research. He found that for conscientious employees, flow was significantly positively related to both in-role and extra-role performance. Eisenberger et al. (2005) found that for employees with a high need for achievement, flow was related to positive mood, task interest, and organisational spontaneity. A. B. Bakker (2005), found that autonomy, feedback, social support, and supervisory coaching at work were predictors of flow. Salanova, Bakker, and Llorens (2006), found that organisational resources (i.e., social support, participation in decision making, and clear goals) and personal resources (i.e., self-efficacy) were related to flow. Furthermore, it was found that reciprocal relationships exist between resources and flow with organisational and personal resources predicting flow and flow predicting organisational and personal resources. Nielsen and Cleal (2010) found that activities with an inherent level of challenge were more likely conducive to flow than others. It was found that planning, problem solving, and evaluation, were activities that predicted flow experiences.

3.6.5 Other applications of flow theory.

Flow theory has also been applied to various other contexts. It has been used to create flow experiences in psychotherapy to counter mental disorders (Duckworth, Steen, & Seligman, 2005); improve web design to create more flow like experiences for users (H. Chen, 2006; H. Chen, Wigand, & Nilan, 1999); identify factors that encourage people to play online computer games (Hsu & Lu, 2004); and explain why certain forms of media (e.g., video/computer games) are enjoyable (Sherry, 2004). Flow principles have also been used to design museum buildings and exhibitions, and to make car manufacturing products more enjoyable (Nakamura & Csikszentmihalyi, 2002). In relationship research, it has also been used to measure flow experiences within relationships (Dean, 2009).

3.7 Other Positive Experiential Constructs

3.7.1 Peak experience.

Flow is conceptually similar to several other concepts which seek to describe positive experiences. For example, Maslow (1968) defined the concept of peak experience which he described as the "moments of highest happiness and fulfilment" (p. 69). Subsequently, Maslow (1971) further defined peak experiences as "short intense glimpses described by great joy, beauty, wholeness, aliveness, perfection, completion, justice, order, effortlessness, playfulness, and self-sufficiency" (p. 129). Leach (1963) defined peak experience as:

> That highly valued experience which is characterised by such intensity of perception, depth of feeling, or sense of profound significance as to cause it to stand out, in the subject's mind, in more or less permanent contrast to the experiences that surround it in time and space (p. 11).

Laski (1962) defined peak experience as "... being joyful, transitory, unexpected, rare, valued, and extraordinary to the point of often seeming as if derived from a praeternatural source" (p. 5).

Peak experiences are seen as intrinsically rewarding (Maslow, 1968), where one's level of intensity, meaningfulness, and richness surpasses their usual level (Privette, 1983).
Maslow (1971) and Laski (1962) assert that peak experiences are synonymous with positive feelings of joy and happiness. However, Blanchard (1969) suggested that peak experiences could also occur during moments of fear and pain. He believed that Maslow's suggestion that peak

experiences were solely positive events was due to an artefact of Maslow's methodology, as respondents were specifically asked to only think about positive experiences (Maslow, 1968). Blanchard suggested that the following elements should represent peak experience: (a) a feeling of heightened awareness, (b) a loss of ego, (c) hallucinations, (d) strong feeling of joy, ecstasy, or terror, (e) possible sensual pleasure, and (f) passivity - a sense that one surrenders to something higher or stronger than him/herself.

Research on peak experience has been conducted in a variety of fields, including the arts (Atkins, 1990; Lowis, 2002), sports/physical activity (Boniface, 2000; Dodson, 1996; Harmison, 2006; Ravizza, 1977), religion (Maslow, 1970), education (Hoffman & Ortiz, 2009), and business (Mathews, 2010; Schindehutte, Morris, & Allen, 2006). However, little research has focused on peak experiences in the workplace (Mathews, 2010). Most research on peak experience has been exploratory and descriptive, where subjective descriptive reports of peak experiences are analysed to extract the characteristics of the construct.

Support for Maslow's definition of peak experience was provided by Ravizza's (1977) interviews of athletes from different sports. Ravizza found that most of those interviewed described peak experiences in terms that were similar to those used by Maslow. Further support for Maslow's conceptualisation of peak experience was provided by Dodson (1996), who found that mountain bikers experienced heightened levels of awareness during moments of peak experiences. Similarly, Schindehutte et al. (2006) found that entrepreneurs commonly described moments of peak experiences in terms of being highly valued, complete, and joyful.

Maslow (1970, 1996) believed that peak experiences could have many beneficial long lasting consequences for personality growth, creativity, and mental and physical well-being. Interviews conducted by Wuthnow (1978) revealed that that those who have several deep and long lasting peak experiences had higher levels of self-efficacy, reported that their lives were more meaningful, and were more interested in helping others than those who did not experience frequent and lasting peak experiences. Panzarella (1980) found that after peak experiences, respondents felt refreshed, relaxed, content, peaceful, and that their problems had diminished. It has also been argued that those who have more frequent peak experiences are also more likely to be fully functioning individuals (Wilson, 1972). However, despite these positive outcomes, Maslow (1971) noted that peak experiences may not always have lasting positive benefits.

Maslow claims that peak experiences are universal, stating that, "all or almost all people have or can have peak experiences" (Maslow, 1970, p. 29). Cross-cultural research has found that students from Canada, Mexico, Norway, Singapore, and Venezuela provide similar descriptions of peak experiences, which provides empirical support for the universal nature of this experience (Hoffman & Ortiz, 2009). Peak experiences are commonly seen to arise from positive interpersonal experiences (Hoffman, Iversen, & Ortiz, 2010), such as romantic love, sexual experiences, and childbirth (Maslow, 1971). Wuthnow (1978) found that individuals are more likely to have peak experiences if they are less materialistic, less concerned with societal status, and more socially aware and responsible.

Peak experiences have generally been assessed through interviews and surveys. Harung, Heaton, Graff, and Alexander (1996) developed the Survey of Peak Experiences, which consists of four open-ended questions, relating to transcendental consciousness (Cook-Greuter, 2000; Maharishi, 1963) during rest, waking activity, sleep, and luck (i.e., moments of coincidental fulfilment of desires). Harung (2012) assessed peak experiences using semi-structured interviews, which asked respondents to describe: (a) what happens when they perform at their best, (b) the specific situation, (c) their inner experiences, and (d) how they relate to others and their surrounding environment. Hoffman et al. (2010) assessed peak experiences among adolescents using two questions, "*Describe an experience when you felt joy and happiness prior to the age of 14*" and "*Describe the impact of this experience on your life*" (Hoffman et al., 2010, p. 69). Hoffman (2003) developed the Peak Questionnaire, which consists of three questions asking respondents to: (a) describe an experience where they felt happiness and joy that remains in their memory, (b) rate using a 5-point scale (1 = *not at all* to 5 = *a very intense amount*) the extent to which this experience affected their view of life, and (c) how the experience affected their view of life.

One of the major criticisms of the peak experience construct, as can be seen from the definitions, is that the conceptual meaning of peak experience is vague and inconsistent. Additionally, there is little consensus as to what level of involvement in a activity qualifies as a peak experience (Boniface, 2000). Another limitation of this construct is that, the specific factors responsible for producing peak experiences are not evident in the literature. A limitation with the measurement of peak experience is that it is typically measured by interviews and open-ended questions, which do not provide quantitative information about peak experiences, but rather more qualitative information (Hoffman et al., 2010). Lastly, although peak experiences can occur in any activity, research has largely been confined to athlete samples (Harung, 2012), and, therefore, research findings may not be generalisable to other populations.

3.7.2 Peak performance.

Another positive experiential construct from humanistic psychology is that of peak performance. Peak performance, described as a superior level of functioning is defined as "superior behaviour, operationally delineated as behaviour that exceeds a person's average functioning. Peak performance is more efficient, creative, productive, or in some way better than ordinary behaviour" (Privette, 1983, pp. 323-324).

As peak performance represents a high level of functioning, it can occur in any activity from a life threatening crisis to having a conversation with a close friend (Privette, 1983). Events that have been shown to be conducive to peak performance include a death crisis, aesthetic (such as, appreciation of art, culture, or nature), intellectual, sport, and personal-interpersonal events (Privette, 1981). Although theoretically everyone has the potential to experience peak performance (Thornton, Privette, & Bundrick, 1999), some may never experience it, experience it only once-in-a-lifetime, experience it often, or, in rare cases, continuously (Privette, 1983).

Peak performance has been found to be a multidimensional construct consisting of three dimensions: clear focus, spontaneity, and expression of self. Clear focus resembles the ability to see events unfold without obstruction, it involves an appreciation of the self, the object, and the relationship between them (Privette, 1981, 2001). In ordinary life, focus is frequently blurred by a number of factors (e.g., an existing headache, a distracting distant conversation, or the need to remember to do something in the future). However, peak performance is characterised by a complete focus on the demands of the task (Privette, 1981). The second dimension of peak performance is spontaneity. Lastly, peak performance is characterised by strength and vitality that is expressed naturally and easily. One feels alive and whole and each part of the mind and body moves together in harmony (Privette, 1981).

Research on peak performance has predominantly focused on athletic activity (Thornton et al., 1999), and much like the research on peak experience, it is largely descriptive and exploratory. Specifically, researchers have frequently sought to better understand the experiential state (e.g., Atkins, 1990; Privette, 1986; Thornton et al., 1999). For example, Thornton et al. (1999) found no significant differences in the defining attributes of peak performance (i.e., the full focus and clear sense of self dyad, and significance and fulfilment) between diverse samples (business leaders and male university students), suggesting that peak performance is likely experienced in the same way across diverse samples and activities in the workplace.

Privette (1986) aimed to better understand and distinguish experiential states (i.e., peak performance, peak experience, average events, misery, and failure) by examining the associated levels of performance and feelings. Analysis of event descriptions revealed that peak experience and peak performance were similar yet distinct constructs. Although peak performance and peak experience were both seen as personally meaningful experiences, they differed in that peak performance was associated with superior performance, whereas peak experience was associated with moments of joy and ineffability. Average events were associated with moderate levels of absorption, while misery was the antithesis to peak experience and failure was the antithesis to peak performance (Privette, 1986). Similarly, Atkins (1990) found that peak performance was associated with peak experience. Using a sample of actors and actresses, he found that participants either experienced feelings of joy (i.e., peak experience) during moments of peak performance (peak experience performance; PEP) or experienced feelings of worry and misery (non-peak experience performance; N-PEP). Interestingly, it was revealed that although some participants experienced negative emotions during peak performance, they experienced positive feelings of joy and happiness after the event. The findings from Atkins' study suggest that the experience of peak performance is not always positive and "may require a gritting of one's teeth... in order to achieve excellence" (Atkins, 1990, p. 127). This finding is inconsistent with Privette's (1981) earlier assertion that peak performance typifies effortless behaviour.

Peak performance, much like peak experience, is typically assessed through interviews and questionnaires. The Privette Experience Questionnaire (1984) asks respondents to describe an experience where they were "functioning at their best". Next respondents are asked to respond to 47 descriptive items (e.g., "*my strength came from an unfamiliar source"*) using a 5-point Likert-type responding format (1 = *no importance* to 5 = *much importance*). Psychometric evaluation has found evidence of reliability and validity (Privette & Bundrick, 1987; Privette & Sherry, 1986).

One of the major strengths of the peak performance construct, especially compared to peak experience, is that its phenomenological structure has been well operationalised. However, much like the research on peak experience, peak performance research is largely limited to the sporting domain and it, therefore, remains to be seen whether this construct can be generalisable to other domains. A further limitation of this construct is that the specific factors responsible for producing peak performance and consequences of the experience appear to remain largely unknown.

3.7.3 Absorption.

In the development of a questionnaire to identify personality characteristics that predict one's hypnotisability, Tellegen and Atkinson (1974) identified a construct they termed "absorption". This factor, which was seen to represent a disposition of deep involvement with an object was defined as a "total attention, involving a full commitment of available perceptual, motoric, imaginative and ideational resources to a unified representation of the attentional object" (Tellegen & Atkinson, 1974, p. 274).

The criterion for selecting items to assess the absorption factor was their ability to predict hypnotic susceptibility. This criterion was used as previous research showed that items that reflect an absorption dimension were found to be associated with hypnotic susceptibility (As as cited in Tellegen & Atkinson, 1974). However, Council, Kirsch, and Hafner (1986), using response expectancy theory, provided empirical evidence to show that the relationship found between absorption and hypnotic susceptibility was an artefact of the testing context. It was found that administering the Tellegen Absorption Scale (TAS) prior to hypnosis influenced an individual's expectancy to be hypnotised; whereas administering the TAS in an independent context was not found to result in a significant absorption hypnosis relationship (Council et al., 1986). This finding raised concerns about the validity of the absorption disposition and consequently resulted in a lack of further research into absorption as a psychological trait (Roche & McConkey, 1990).

More recently, Jamieson (2005) explored the structure and the meaning of the absorption construct as defined by Tellengen and Atkinson (1974). In his research he modified the original TAS scale after identifying problems in the wording of items and response format. The items of the modified TAS, named MODTAS, were subjected to an exploratory factor analysis and yielded five first-order factors, which were interpreted as: synaesthesia (i.e., one sensory modality affects another), altered states of consciousness, aesthetic involvement in nature, imaginative involvement, and extra sensory perception (Jamieson, 2005). It was also revealed that these five first-order factors come together to represent a higher-order, absorption, factor (Jamieson, 2005).

Research on absorption has largely been in the areas of hypnosis (Council et al., 1986; J. P. Green & Lynn, 2010; Nadon, Hoyt, Register, & Kihlstom, 1991) and psychophysiology (Ehrnrooth et al., 2002; Zachariae, Jorgensen, Bjerring, & Svendsen, 2000). Absorption has largely been ignored in the organisational literature. For example, only one published study has utilised Tellegen and Atkinson's (1974) absorption construct in the workplace (Smith-Jackson & Klein, 2009). This study examined the effects of irrelevant speech (i.e., background noise) and individual differences on performance and cognitive workload. It was found that those with a high level of absorption performed better than those with a low level of absorption, particularly in the presence of background noise. Smith-Jackson and Klein (2009) suggested that organisations should try to enhance focused attention (i.e., absorption) as part of standard workplace training, particularly as workplaces are now adopting more cost-effective open-plan designs, which often result in increased background noise.

Despite the improved measure of absorption by Jamieson (2005), the first-order factors unlikely exhaust the full meaning of absorption. There are likely other facets that represent this construct that also need to be further developed and tested. For example, supernatural experiences, identity, and religious experience have all been identified as potential facets (Jamieson, 2005). It appears that the absorption construct emerged from an exploration into the factors responsible for hypnotic susceptibility and little research has provided further insight into its meaning. As noted above, research on absorption has largely been confined to hypnosis and psychophysiology, and there little is known about the factors responsible for experiencing absorption and consequences of experiencing it (apart from one's ability to be hypnotised). Furthermore, due to its dispositional nature, another limitation is its practical usefulness in the workplace. Absorption, as it is largely seen as a trait characteristic rather than a state, infers that one's level of absorption is unlikely to be amenable to change. Workplace changes, education, or training would likely have little impact on one's ability to experience absorption. It may, however, serve as a useful construct in employee screening and selection.

3.8 Similarities and Differences Between Peak Experience, Peak Performance, Absorption, and Flow

It is to be expected that there is some conceptual overlap between all four constructs as they relate to positive experiences. One conceptual similarity of all four constructs is that of deep involvement, which is likely responsible for superior functioning in peak performance, enjoyment derived from flow and peak experiences (Privette, 1983), and positive affect in absorption (Pekala, Wenger, & Levine, 1985). Another common characteristic of flow, peak performance, and peak experience is that of spontaneous and effortless action/movement. This characteristic is likely due to the perceived clear demands of the event/task (Privette, 1983). Flow and absorption are also similar in that absorption can become so intense that it results in a decreased awareness of self (Pekala et al., 1985) and a possible merging of self with the object or task (Tellegen & Atkinson, 1974).

Although the constructs share some conceptual overlap, they do represent distinct positive experiences and it is for this reason that the each phenomenon can be experienced in isolation (Privette, 1981). Notable differences between the constructs are that peak experiences refer to mystical experiences (e.g., cosmic and ecstasy experiences) whereas this element has not largely been identified in descriptions of flow and peak performance (Privette, 1983). Peak experience and flow, refer more to a psychological state, whereas peak performance is more specific and focused on one's level of functioning and performance outcomes (Harmison, 2006; S. A. Jackson & Marsh, 1996). A distinguishing feature of peak experience is that one experiences intense feelings of joy or ecstasy, whereas in peak performance and flow such intense feelings are often not experienced during the experience (Boniface, 2000).

Conversely, given the conceptual overlap of these four constructs, it is also likely that a single event may involve all these experiences (i.e., flow, peak performance, peak experience, and absorption). Empirical support for this contention has been found (Atkins, 1990; Privette, 1986). Additionally, peak performance has been found to have significant positive reciprocal relationships with peak experience (Privette, 1982). These findings are in line with Maslow (1971) suggestion that peak experiences often result in superior functioning (i.e., peak performance).

3.9 Conclusion

As mentioned previously, the flow experience was initially criticised for being too ethereal, almost mystical, and lacking objectivity (Csikszentmihalyi, 1988b). Another criticism made was that flow theory was seen as too Westernised, in that it was mainly concerned with goal directed behaviour (Csikszentmihalyi, 1988b), and it was unclear as to whether flow could be experienced in non-goal directed activity such as day dreaming (Nakamura & Csikszentmihalyi, 2009). Additionally, flow theory was seen to be more applicable to males than females as it involved active and goal directed behaviour (Csikszentmihalyi, 1988b). However, despite these early criticisms, flow theory has become a well-known and accepted construct in positive psychology. It has been widely researched and has had many implications for a number of different fields (Engeser & Schiepe-Tiska, 2012).

A major strength of the flow construct over other positive experiential constructs is that it is well grounded in theory. As mentioned previously, the flow experience was constructed from rich qualitative interviews and its phenomenological structure has been tested in various domains and across diverse samples, including the workplace. More importantly, there is a high level of agreement with regard to its meaning and the theory has had minimal modifications since its development (Engeser & Schiepe-Tiska, 2012). However, some researchers have suggested that future research is needed to better distinguish possible antecedents and the outcome from the experiential state (Nielsen & Cleal, 2010; Shin, 2006). Another strength of flow theory is that there are a number of identified antecedents that have been found to be conducive of flow and, despite being intrinsically rewarding in its own right, research has continually shown that the flow experience may be responsible for many other benefits, both at an individual, organisational, and societal level (R. G. Mitchell, Jr., 1988).

Arguably, one of the most obvious applications of flow theory is the workplace. As previously mentioned, the workplace is where many people spend much of their adult lives, often in a state of boredom or anxiety (Csikszentmihalyi, 1975). Many people feel alienated at work and believe that their time spent at work is wasted. Work is seen as an obligation and largely extrinsically rewarding (Csikszentmihalyi, 2002). Furthermore, it is apparent that the nature of work has become less conducive to flow, unlike the more traditional forms of work (e.g., hunting and farming; Delle Fave & Massimini, 1988). Despite these concerns, little research has been conducted on flow in the workplace (Eisenberger et al., 2005). More specifically, little research has examined ways to best capture the flow experience at work, and examine the conditions responsible for it (Nielsen & Cleal, 2010). Given the need for more research on the application of flow theory in the workplace and given its suitability and theoretical strengths over other positive experiential constructs, this thesis will specifically focus on flow in the workplace. In the following chapter, work motivation theories and related concepts will be reviewed, highlighting the potential application of flow theory in the workplace.

Chapter 4

Similarities Between Flow Theory and Work Motivation Theories and Related Concepts

4.1 Overview

Can flow theory be appropriately applied to the workplace? It is essential to address this question as the flow phenomenon was initially identified from play and game-based activities that were intrinsically rewarding and enjoyable, whereas work may be the antithesis of this. Intrinsic rewards and enjoyment are often not built into work roles, and work is often viewed as being hard and unpleasant (Csikszentmihalyi, 1975). By reviewing existing work motivation theories and related concepts, and highlighting their similarities to flow theory, this chapter aims to show that flow is a construct that can be usefully applied in the workplace. In addition, this chapter concludes with an argument as to why the application of flow theory in the workplace may be more beneficial than the current work motivation theories and related concepts.

4.2 Existing Work Motivation Theories and Related Concepts

There are many work related theories and concepts that explain work motivation, often with some degree of overlap among them. This chapter reviews a few of the more well-known theories and concepts.

4.2.1 Job characteristics model.

The job characteristics model (JCM) is one of the dominant approaches used to explain the relationships between job characteristics, work motivation, and positive work outcomes (C.-C. Chen & Chiu, 2009; Torraco, 2005). Since its development in 1976, the JCM has generated a large body of research, influenced work design, and improved work outcomes (Torraco, 2005).

The JCM proposes that there are five core job characteristics that induce three psychological states that, in turn, result in positive individual and work outcomes. It is also suggested that the relationship between job characteristics and psychological states, and between psychological states and positive outcomes, may be moderated by individual differences, such as the need for personal growth and development, job relevant knowledge and skill, and satisfaction with the work context (e.g., pay, job security, colleagues, and supervisors; Oldham & Hackman, 2010; Oldham, Hackman, & Pearce, 1976).

The five job characteristics proposed in the JCM are: skill variety, task identity, task significance, autonomy, and feedback. Skill variety is the extent to which a number of different skills are required to complete a job. The requirement of a number of different skills also stretches one's abilities. Task identity is the extent to which a job is seen as "whole" and identifiable, meaning that it can be carried out from start to finish. Task significance is the extent to which an employee perceives their work to have a substantial positive effect on the lives or work of other people. Autonomy is defined as the extent to which work provides freedom, independence, and allows for discretion in how one's work is carried out. Feedback is the direct and clear information about how well one is performing (Hackman & Oldham, 1976).

The three psychological states of the JCM are: meaningfulness of work, responsibility for work outcomes, and knowledge of results. Meaningfulness of work is the extent to which an employee perceives that their job is meaningful, worthwhile, and valuable. Responsibility for work outcomes is the extent to which an employee feels responsible for the completion of the work he/she does. Knowledge of results is the extent to which an employee is continuously aware of how well he/she is performing, either through feedback obtained from within the task or externally (Hackman & Oldham, 1976). Experiencing these psychological states is said to result in positive affect, which is an inherent incentive resulting in a high level of motivation and performance. Thus, according to the JCM, motivation and performance will be at their highest when all three psychological states are experienced (Hackman & Oldham, 1976).

An interesting feature of the JCM is the predicted unique relationships between the job characteristics and the psychological states. For example, skill variety, task identity, and task significance are said to predict the psychological state of meaningfulness of work; autonomy is said to predict responsibility for work outcomes; and feedback is said to predict knowledge of results (Hackman & Oldham, 1976). The outcome variables of the JCM include internal work motivation, work performance, job satisfaction, absenteeism, and turnover (Hackman & Oldham, 1976).

Findings from a large sample of over 1,000 employees, from 100 different occupations, and multiple organisations provide empirical support for the JCM, suggesting that the job characteristics are universal in nature and not confined to specific job designs (Hackman, Oldham, Janson, & Purdy, 1975). Additionally, a review and meta-analysis of close to 200 relevant studies concluded that the JCM is a reasonably valid model (Fried & Ferris, 1987). Furthermore, general support for the JCM was also found in a more recent study that tested the validity of the JCM in more modern workplace environments, however, the moderating effect of the satisfaction with work context, the only moderating effect tested, was unsupported (De Varo, Li, & Brookshire, 2007).

Empirical evidence shows that the core job characteristics of the JCM are predictors of flow at work. Demerouti (2006) found that the five core job characteristics of the JCM (i.e., skill variety, task identity, task significance, autonomy, and feedback), form a higher-order single, "motivating potential" factor, which predicted flow at work. More recently, Fullagar and Kelloway (2009) suggested that not all the job characteristics should be equally predictive of flow. In support of this proposition, they found that skill variety and autonomy were significant predictors of flow whereas feedback, task significance, and task identity were not found to be significant predictors.

A number of the job characteristics in the JCM that are responsible for positive work outcomes (i.e., motivation) either exist or are at least similar to the conditions to flow. For example, in the JCM, skill variety is somewhat similar to the balance between challenge and skills dimension of flow theory in that the demands of the activity are likely to stretch one's skills, resulting in motivation. Autonomy is similar to the control dimension of flow theory. Specifically, without this characteristic of the task, one is not free to set goals or change his/her actions. Feedback is explicitly mentioned in both the JCM and flow theory as being necessary, with both requiring this to be clear/unambiguous, direct, and received constantly. Finally, both the JCM and flow theory include individual differences that may also affect positive outcomes. The JCM's individual growth need strength, is similar to the need for achievement, which is one of the suggested characteristics of flow's autotelic personality (Nakamura & Csikszentmihalyi, 2002).

4.2.2 Self-determination theory.

Although not specifically a work motivation theory, self-determination theory (SDT) is useful for understanding work motivation, and has been appropriately applied in workplace settings (Gagné & Deci, 2005). SDT assumes that we have a natural and innate tendency to be actively engaged and to experience personal development. We tend to naturally pursue our own interests, seek challenges, and learn. In other words, we are naturally intrinsically motivated (Deci & Ryan, 2002; Ryan & Deci, 2000). To be self-determined is to have the "capacity to choose and to have those choices, rather than reinforcement contingencies, drives or any other forces or pressures, be the determinates of one's actions" (Deci & Ryan, 1985, p. 38). Intrinsic motivation or self-determination is said to promote effort, agency, and commitment, and can be seen as a highly positive characteristic of human nature (Ryan & Deci, 2000).

Research guided by SDT aimed to identify the factors that both facilitate and diminish intrinsic motivation – self-determined behaviour (Deci & Ryan, 1985, 2002; Ryan & Deci, 2000). In determining the factors responsible for intrinsic motivation, cognitive evaluation theory (CET), a sub-theory within SDT, suggests that there are three psychological needs that facilitate intrinsic motivation. A psychological need is defined as "an energising state that, if satisfied, conduces toward health and well-being but, if not satisfied, contributes to pathology and ill-being" (Ryan & Deci, 2000, p. 74). It is suggested that these needs are innate, essential, and universal in nature, and that one cannot thrive without satisfying all three needs (Deci & Ryan, 2002; Ryan & Deci, 2000). The three psychological needs that facilitate intrinsic motivation are: (1) competency, defined as the belief that one is capable of carrying out an activity, it is derived from factors such as feedback, rewards, and optimal challenges; (2) autonomy, which is the need to experience behaviour as self-determined; and (3) relatedness, which is the need to feel secure and connected to others. It has been acknowledged, however, that the need for relatedness may not necessarily be a factor responsible for intrinsic motivation, as intrinsically motivated activities can often be performed in isolation (Ryan & Deci, 2000).

Most work motivation theories view motivation as being a single additive construct that varies in degree, not in kind. In contrast, SDT views motivation along a continuum from amotivation, being a lack of motivation altogether, to autonomous motivation, which is purely self-determined. Four types of controlled motivation (i.e., external, introjected, identified, and integrated) are said to lie along this continuum, in between amotivation and autonomous motivation, as they represent varying degrees of autonomous motivation. It is considered important to distinguish between different types of motivations (i.e., controlled vs. autonomous), as research has shown that controlled motivation may actually reduce, rather than add to motivation levels (Gagné & Deci, 2005). Controlled motivation represents being forced to act either by external rewards or to avoid punishment (i.e., extrinsic motivation). In contrast, autonomous motivation is where one can act with volition, and is free to decide how to carry out a task. An example of autonomous motivation is intrinsic motivation – engaging in an activity because it is interesting in and of itself (Gagné & Deci, 2005).

Activities that are carried out for external rewards only, such as extrinsic motivation, are said to be externally regulated. However, it is important to note that not all extrinsically motivated behaviour is solely externally regulated. According to organismic integration theory (OIT), another sub-theory within SDT, there are three different processes that result in extrinsic motivation being internally regulated to some degree: introjection, identification, and integration.

Introjected regulation derives from within but is not accepted as one's own and is still relatively externally controlled. Identified regulation is where people experience autonomy as the demands and goals of an activity are somewhat related to their own goals and identities but the source of motivation is still largely externally controlled. Integrated regulation is where people feel that their actions required for a particular task (i.e., external regulation), are strongly aligned with their own sense of self (i.e., their own identity, interests, beliefs, and values). As one's actions are aligned with their sense of self, behaviour is felt as self-determined. Of the three internalisation processes, integrated regulation is seen as the fullest form, as it allows for extrinsic motivation to be autonomous or self-determined. According to SDT, psychological needs also must be satisfied for internalisation to occur. For example, the satisfaction of the needs for relatedness and competency are required for all three internalisation processes, and autonomy is also required for identified and integrated regulation (Gagné & Deci, 2005).

To briefly summarise, the SDT model of motivation posits that at one end of the continuum, amotivation is the lack or absence of any intentional regulation and at the other end of the continuum is intrinsic motivation, which resembles pure interest and enjoyment and is therefore, self-determined. Along this continuum, in between amotivation and intrinsic motivation, lie four types of extrinsic motivation that are progressively more self-determined. External regulation is the most controlled and least self-determined, introjected regulation is moderately controlled motivation and slightly more self-determined, identified regulation is moderately self-determined (autonomous), and integrated regulation which, although is partly extrinsically motivating, is also autonomously motivating and, therefore, at least partly self-determined.

According to SDT, the more one's behaviour is self-determined or internalised, the greater are the benefits. SDT research suggests that the aforementioned innate psychological needs of autonomy, relatedness, and competency results in authenticity and commitment, and that their absence leads to alienation and inauthenticity (Ryan & Deci, 2000). Research has found that the three psychological needs were found to be predictors of well-being (Gagné, Ryan, & Bargmann, 2003; Ries, Sheldon, Gable, Roscoe, & Ryan, 2000). More specifically in the work context, psychological needs were found to predict well-being on the job (Deci et al., 2001; Ilardi, Leone, Kasser, & Ryan, 1993), job satisfaction, self-esteem (Ilardi et al., 1993), performance (Baard, Deci, & Ryan, 2004; Kasser, Davey, & Ryan, 1992), psychological adjustment (Baard et al., 2004), acceptance of change (Gagné, Koestner, & Zuckerman, 2000), and work engagement (Deci et al., 2001). It is suggested that a lack of these innate psychological needs is a major reason why the workforce is disengaged, why students sit and stare aimlessly in their classrooms, and why patients fail to comply with therapy (Ryan & Deci, 2000). SDT suggests that by providing supports for autonomy, competency, and relatedness we can prevent alienation and mental illness (Ryan & Deci, 2000).

Originally, SDT much like flow theory, had a main focus on intrinsic motivation. At that point, both suggested that autonomous or self-determined behaviour results in greater performance compared to controlled extrinsic motivation. A further similarity between flow theory and SDT is that both predict that self-determined behaviour, although slightly differently described, is responsible for many positive benefits, including well-being and enjoyment.

The psychological needs that facilitate self-determined behaviour are similar to the conditions proposed in flow theory. Competency is similar to the balance between challenge and skills condition for flow, in that, if one does not believe they are capable of carrying out an activity, flow is unlikely to occur. Additionally, SDT states that for competency to occur, feedback and appropriately challenging activities are required, which are also similar to the conditions to flow. Specifically, the need for autonomy is similar to the control condition for flow: without feeling like one is in control or is free to make decisions about how to obtain a particular goal, flow is unlikely to occur. The psychological need for relatedness is somewhat similar to flow's loss of self-consciousness dimension, where a person loses their sense of "self" and feels a sense of connectedness with their environment. The difference between relatedness and loss of self-consciousness is that the former suggests a connectedness with others, while the latter more broadly suggests a connectedness or union with one's environment. However, both involve an experience of self as connected to something beyond one's self.

4.2.3 Goal setting theory.

Goal setting theorists Locke and Latham (1990) state that goals can be seen as a basis for directing behaviour, motivation, and performance. It is important to note that goal setting theory (GST) is an "open" theory, whereby it is adapted and revised as new discoveries are found. Reviewed here are the main elements, mediators, and moderators of GST (Locke & Latham, 2006). In general, it is suggested that setting high or difficult goals predicts both high levels of effort and high levels of performance (Locke & Latham, 1990). However, performance does diminish when goals exceed one's capabilities, and commitment lapses when faced with highly difficult goals (Erez & Zidon, 1984). Goal setting theorists suggest that setting specific, difficult goals rather than vague “do-your best” goals also results in higher performance (Locke & Latham, 1990).

GST suggests that the relationship between goals and performance is influenced by four mechanisms. Firstly, goals direct and focus attention to relevant actions needed for goal accomplishment, and direct attention away from unnecessary actions or activities (Locke & Latham, 2002). Secondly, high goals serve as an energising agent, in that they produce greater effort than when low goals are set (Locke & Latham, 2002, 2006). Thirdly, setting high goals leads to greater persistence compared to moderately difficult, vague, or easy goals (Locke & Latham, 2002, 2006). Lastly, the effect of goals on performance is mediated by one’s capabilities, either existing or acquirable knowledge and skills (Locke & Latham, 2006).

GST has also identified a number of key moderators of goal effects on performance, including goal commitment, feedback, and task complexity. Goal commitment is said to strengthen the relationship between goals and performance. Goal commitment is facilitated by the two factors, importance (e.g., how important is the goal?) and attainability (i.e., self-efficacy). Feedback is required for goal-directed action to be effective allowing individuals to monitor their progress towards achieving a goal. Task complexity is another moderator of the relationship between goals and performance, whereby the effects of goals on performance are reduced for more complex tasks. This is because such tasks often need to allow for the discovery of new strategies, which are often difficult to establish when specific task goals are set (Locke & Latham, 2002). This moderating effect is likely due to “tunnel vision”, whereby an employee is focused on goal attainment rather than acquiring the necessary skills needed. In such a scenario, it is suggested that it may be more beneficial to set learning goals to acquire new skills rather than set goals orientated towards task completion (Locke & Latham, 2002).

GST is considered one of the most significant theories in management literature, having a substantial impact on management education and practice (Ordóñez, Schweitzer, Galinsky, & Bazerman, 2009). Evidence for both the internal and external validity of GST has been found among 88 different tasks in multiple countries, using more than 40,000 participants (Locke & Latham, 1990). Support for GST has also been found in both experimental and correlational designs, including field and laboratory settings and across individual, group, and organisational unit levels (Locke & Latham, 2006).

GST is similar to flow theory in a number of ways. Firstly, much like flow theory, GST is primarily focused on task level conditions (i.e., task specific goals) that effect motivation. Secondly, the importance of setting specific goals rather than vague, “do your best” goals is an important element found in both theories. Lastly, GST and flow theory both suggest the importance of receiving feedback and that goals should not exceed one's capabilities.

4.2.4 Employee engagement.

A large volume of research has been generated over the last 10 years helping us to better understand employee engagement (Scottish Executive Social Research, 2007). However, the meaning of employee engagement still remains ambiguous in both research and practice (Macey & Schneider, 2008), and there is an alarming range of different definitions of employee engagement (Dalal, Brummel, Wee, & Thomas, 2008; Macey & Schneider, 2008).

Employee engagement is largely viewed as a psychological state (Macey & Schneider, 2008). Kahn, a prominent researcher in the field of employee engagement, states that individuals can physically, cognitively, and emotionally vary the amount of themselves that they employ in their work roles. Performance in a role is considered to be related to the amount of self presented or absented from a role, and it is this that determines whether one is personally engaged (Kahn, 1990). From his research, Kahn defined personal engagement and personal disengagement. Personal engagement is defined as the involvement of an individual's preferred self in role, physically, cognitively, and emotionally (Kahn, 1990). Personal disengagement, on the other hand, is the absence of an individual's preferred self in role, physically, cognitively, and emotionally (Kahn, 1990). An example of personal disengagement can be observed among robotic and automatic roles, where one's own physical and cognitive skills are not easily incorporated into the role itself.

Schaufeli, Salanova, González-Romá, and Bakker (2002) state that engagement is the opposite of burnout; it is "a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication, and absorption"(p. 74). Vigour involves high energy levels, mental resilience, and willingness towards effort and persistence. Dedication is a sense of significance, enthusiasm, inspiration, pride, and challenge. Finally, absorption is full concentration and difficulty detaching from the work itself (Schaufeli et al., 2002). It has been suggested by Schaufeli et al. (2002) that engagement is more of a persistent and pervasive cognitive state.

Macey and Schneider (2008) have recently attempted to further clarify the concept of engagement, suggesting that it may be best conceptualised as the combination of the three distinct dimensions of state engagement, behavioural engagement, and trait engagement. Macey and Schneider suggest that state engagement involves a high level of involvement with the work and the organisation, enthusiasm, alertness, and investment of self in the work. Behavioural engagement, a consequence of state engagement, can be directly observed within the workplace, and should be viewed as behaviour that is above and beyond what is typical (with an appropriate frame of reference specified), adaptive, and innovative. Simply arriving to work on time and doing what one is typically expected to do, should not be seen as behavioural engagement (Macey & Schneider, 2008). Combined, however, both state and behavioural engagement do not represent engagement fully. For instance, both state and behavioural engagement fail to explain why some are more engaged in their work, while others are not. Individual differences can affect the way we experience work and, therefore, should also be considered when looking at engagement (Macey & Schneider, 2008). Macey and Schneider have suggested positive affectivity (i.e., tendency to be enthusiastic and energetic), proactive personality (i.e., tendency to manipulate the work environment), conscientiousness (i.e., tendency to be thorough and hard-working) and autotelic personality (i.e., openness to new challenges and ability to persist in challenging tasks) should be considered as trait engagement, which may be the antecedents of state and behavioural engagement. However, Macey and Schneider's (2008) proposition that employee engagement can be represented by three distinct dimensions (i.e., state engagement, behavioural engagement, and trait engagement) has been criticised by Dalal et al. (2008) who have suggested that behavioural and trait engagement, as defined by Macey and Schneider, are better viewed as outcomes and antecedents of engagement, respectively, rather than dimensions of engagement. Dalal et al. suggested that defining a construct in terms of its antecedents and outcomes is problematic as it confounds the construct.

In general, it can be seen from the above definitions of employee engagement that most academics define this concept as incorporating both a vigour and identification dimension (i.e., a merging of the self with the work role). Similarly, in a review conducted by A. B. Bakker et al. (2008), it was concluded that the majority of employee engagement definitions also included these two dimensions. According to Fullagar, Downey, Wefald, and Rupayana (2006), flow can be seen as a form of work engagement. From the definitions of employee engagement reviewed in this chapter, it can be seen that flow incorporates the vigour dimension found in employee engagement. That is, when in a state of flow, we harness all our available psychic energy, enter into a complete state of deep concentration, and reach a state of optimal performance. Flow also incorporates the identification (merging of self in role) dimension of employee engagement: During a flow state, as concentration is so intense, we lose a sense of self and experience a merging of self and activity: "You don't see yourself as separate from the activity" (Csikszentmihalyi, 2002, p. 53). However, employee engagement differs from flow in that it is defined as persistent involvement with work in general (Schaufeli et al., 2002), whereas flow represents complete involvement in a specific task (Nakamura & Csikszentmihalyi, 2009).

The employee engagement literature suggests that there are a number of conditions responsible for improving employee engagement. Macey and Schneider (2008) proposed that, situational conditions such as leadership (e.g., fairness, acknowledgement, and clear expectations) and trust (psychological safety) may increase behavioural engagement and, therefore, should be seen as antecedents to engagement. According to Maslach, Schaufeli, and Leiter (2001) there are six factors responsible for engagement. They include: a manageable workload, control, rewards and recognition, a supportive work community, perceived fairness, and having similar values to that of the organisation. Research has found that, certain workplace conditions are related to engagement (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Hakanen, Bakker, & Schaufeli, 2006; Schaufeli & Bakker, 2004). Schaufeli and Bakker (2004) and Demerouti et al. (2001) found that available job resources (i.e., resources that help reduce job demands, assist in achieving goals, or promote personal growth and development) were found to positively predict engagement. Similarly, Hakanen, Bakker, and Schaufeli (2006) also found that job resources (i.e., job control, information, supervisory support, innovative climate, and social climate) were positively associated with work engagement. Furthermore, it was also found in a longitudinal study that job resources (particularly job control and organisation-based self-esteem) positively predicted all three dimensions of engagement (i.e., vigour, dedication, and absorption) two years later (Mauno, Kinnunen, & Ruokolainen, 2007).

The employee engagement literature suggests a large number of possible antecedents. This is likely due to the varying definitions of employee engagement. Flow theory, however, does share some similar task level antecedents with some of the concepts of employee engagement. For example: control; clear expectations from supervisor, which is similar to the clear goals condition of flow theory; and work load, which is somewhat similar to the balance between challenge and skills condition of flow theory, in that one’s workload should not exceed one’s capabilities.

4.3 Conclusion

From the literature reviewed in this chapter, it can be seen that flow theory incorporates many of the known conditions proposed in alternative theories of work motivation, suggesting that it may also be a useful construct for understanding motivation in the workplace. Furthermore, the conditions responsible for flow, as they exist at the task level, are highly actionable in the workplace, and may aid in task restructuring or the development of useful interventions that can bring about change. Additionally, given that flow represents a form of intrinsic motivation, it can be expected that many of the positive work and employee outcomes found in the reviewed literature, may also occur as a result of experiencing flow in the workplace.

It is argued that for many reasons, the application of flow theory to the workplace may also have many benefits beyond alternative work motivation theories and related concepts. Firstly, from the SDT literature, it is apparent that there is a need to distinguish between autonomous and controlled types of motivation, as controlled motivation has been found to potentially decrease overall motivation levels (Gagné & Deci, 2005). Unlike other work motivation theories and related concepts (except for SDT), flow is purely an autonomous form of motivation, which is not confounded by controlled motivation. Secondly, flow arguably represents the highest form of motivation achievable (Ceja & Navarro, 2009), where one performs at their peak (Nakamura & Csikszentmihalyi, 2002). It represents moments of total involvement (Csikszentmihalyi, 1988b, 2002). All available psychic energy is directed towards the task at hand, one is completely immersed (Csikszentmihalyi, 1975, 2002), and operates at full capacity (Nakamura & Csikszentmihalyi, 2002). Other work motivation constructs, on the other hand, represent motivation along a continuum, thus, representing differing levels to which one is motivated or engaged, not necessarily peak motivation. Flow may, therefore, be seen as a more specific, higher-order motivation construct to those reviewed in this chapter. Thirdly, from the above review, it can be seen that flow theory encompasses many of the related organisational motivation constructs reviewed in this chapter, and also, as detailed in Chapter 3, encompasses other similar positive experiential constructs (i.e., peak performance, peak experience, and absorption). Lastly, not necessarily an outcome of being motivated or engaged, flow produces intense authentic enjoyment, which is referred to as going beyond what one is capable of doing or accomplishing something new (Csikszentmihalyi, 2002). Having detailed, in this chapter, that flow theory may be appropriately applied in the workplace and may potentially have greater benefits over existing work motivation theories and related constructs, the next chapter reviews existing means for assessing flow in the workplace.

Chapter 5

A Critical Review of the Assessment of Flow

5.1 Overview

This chapter begins with a brief review of the recommended guidelines considered necessary for scale development. Then, currently known means for assessing flow at work will be critically reviewed with their strengths and limitations highlighted. For scales used to assess the flow experience, the guidelines for scale development will be used to evaluate their psychometric rigour.

5.2 Recommended Steps Necessary for Scale Development

Measurement is a vital part of any science, particularly for behavioural and social scientists, where scales are used to identify psychological and social phenomena that are not directly observable (e.g., depression or anxiety). When measuring such abstract concepts, it is important that scales undergo rigorous development to test their reliability, be extensively validated prior to their use, and have psychometrically sound properties. Regrettably, however, not all scales are developed in this way, nor is their validity empirically tested (DeVellis, 2003), often resulting in psychometrically poor scales. Briefly reviewed here are the recommended steps considered necessary for the development of scales.

In the initial development stage, prior to either generating new items or selecting items from existing scales, the scale developer should have a clear understanding of the construct they wish to measure and how it differs from other constructs. Theory often helps provide clarity as to what one wishes to measure, however, there may be instances where a theoretical model does not exist. In either scenario, it is important to provide a clear definition as to the phenomenon one wishes to measure, whether it be based on an existing theory or a tentative theory (DeVellis, 2003).

Once having developed a clear understanding of what one wishes to measure, items can next either be generated or selected from existing scales. Items determine the psychometric properties of a scale, and it is therefore important that items, as best as possible, accurately reflect the underlying latent variable/construct. Items should define the construct of interest only, and many items should either be generated or selected, so as to exhaust the different possibilities of measuring the intended underlying construct. The initial pool of items in a scale should be larger than the number of items that end up in the final scale, however, there is no set criteria as to how many items should be included in the initial item pool. It is largely dependent on the construct being measured, and the feasibility of administering such a large number of items to a single sample in one occasion (DeVellis, 2003).

Items within a scale should be clear, concise, and set at a suitable reading difficulty for the intended audience. Items should not contain *double negatives* (e.g., “I am not looking forward to not working today”). Items should also not contain two or more ideas, *double barrelled* (e.g., “I like to go outside and play with my son”). When using a Likert form of scaling, items typically should be worded fairly strongly to allow for the degree of agreement or disagreement to be expressed by the response options (DeVellis, 2003). To prevent acquiescent responding, where a participant tends to agree with every statement regardless of their content, it is often advisable to include *negatively keyed items* in the scale (Anastasi, 1982; DeVellis, 2003; Nunnally, 1978). A negatively keyed item, is one where endorsement to that particular item represents a low level or the absence of the construct being measured (DeVellis, 2003). For example, negatively keyed items for the regular worded item, “*I am happy*”, could be “*I am sad*” (reversed scored, polar opposite) and “*I am not happy*” (reversed scored, negated regular; Schriesheim & Eisenbach, 1995, p. 1177). Another important step in item construction is having your intended items reviewed by others who have a good knowledge of the construct being measured. Reviewers can rate the relevance of items to each scale or subscale, identify confusing and/or ambiguous items, and suggest the addition of other useful items (DeVellis, 2003).

When administering an initial pool of items to a sample, it is important that the sample is large enough to avoid the possibility of items correlating by chance. Nunnally (1978) suggests that a sample size of 300 is ideal. Additionally, it is important that the sample recruited be, as best as possible, representative of the population the scale was intended for.

The reliability of the scale is an important psychometric property of a scale; it is defined as the “... proportion of variance attributable to the true score of the latent variable” (DeVellis, 2003, p. 27). Typically, internal consistency is used to determine the reliability of a scale; internal consistency refers to the homogeneity of items that make up a scale or subscale. It is typically determined and reported using Cronbach’s alpha coefficient (α), where alpha can range from .0 to 1.0, with a higher value indicative of a more internally consistent scale. Nunnally (1978) recommends that an alpha level of .70 is acceptable and DeVellis (2003) suggests the following acceptable ranges based on personal experience and recommendations from other investigators: “below .60 unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80, respectable; between .80 and .90, very good; above .90, one should consider shortening the scale" (pp. 95–96).

Whilst reliability analysis (i.e., Cronbach's alpha coefficient) provides information about how related a set of items are, it does not determine whether all the items relate to a single latent variable. For instance, it is possible to have a high Cronbach's alpha coefficient for a scale that has two latent variables. That is, some items reflect one latent variable and the rest reflect a second latent variable. In order to empirically determine how many factors (i.e., latent variables) underlie a set of items, the developed scale should be subjected to factor analysis. Factor analysis serves many purposes: it helps to determine the number of underlying factors within a construct, condenses the number of variables (scale items) into a smaller set of variables (latent variables/factors), and it aids in the interpretation of the latent variables (DeVellis, 2003). During the early development of a scale, factor analysis is also used to examine the construct validity; that is, does it measure the intended underlying construct(s)? Additionally, factor analysis allows for the identification of items that do not measure their intended construct or measure more than one construct. It is suggested that these items, those that either do not measure their intended construct or measure more than one construct, should be considered for revision or deletion (Worthington & Whittaker, 2006). It is recommended that all new scales be subjected to factor analysis prior to their use in research (Briggs & Cheek, 1986; Nunnally, 1978).

Reliability and factor analysis provide information about the degree to which a latent variable is responsible for items covarying and helps to determine how many factors the items underlie within a scale. However, they do not provide information as to what variable, and if it is the intended latent variable, that is causing the items to covary. To determine if the intended latent variable is in fact the cause of item covariance or not, validity testing is used: "Does the instrument measure what it is suppose to?" (Gable & Wolf, 1993, p. 95). There are three types of validity typically used to test the validity of a scale: content validity, criterion-related validity, and construct validity (DeVellis, 2003).

5.2.1 Content validity.

Content validity is the extent to which items are seen to reflect their intended latent variable. Establishing evidence of content validity can be achieved by having others who are familiar with the construct, review and make suggestions about the relevancy of each item to the intended underlying construct (DeVellis, 2003).

5.2.2 Criterion-related validity.

Criterion-related validity is the extent to which a scale has an empirical association with some criterion. It is the overarching term used to describe when either the criterion occurs prior (postdictive validity), occurs at the same time (concurrent validity), or occurs after the measurement of the construct of interest (predictive validity; DeVellis, 2003).

5.2.3 Construct validity.

Construct validity refers to the expected theoretical relationship between a scale and other variables, that is: does the construct being measured by the scale behave the way it is expected to in relation to existing scales of other constructs. Construct validity is a general, over arching term for a number of forms of validity including convergent, discriminant, and known group validity. Evidence of convergent validity is when a scale is related to other existing measures that are known to be related. When determining evidence of convergent validity, there are no set criteria as to how strong the relationship between the developed scale and other measures should be; it may likely vary as a result of theory, however, it is expected that the variables should covary more than what could be attributed to measurement method variance (DeVellis, 2003). Evidence of discriminant validity occurs when the scale being tested is found to be unrelated to other measures that are known to be unrelated. Known group validity is where two groups that are known to differ on the construct being measured are compared using the newly developed scale; significant differences between these two groups infer evidence of construct validity (DeVellis, 2003). Construct validity is considered one of the most important forms of validity testing (P. Kline, 1993).

5.3 Measuring Flow

Currently known methods for assessing flow at work will now be critically reviewed, with their strengths and limitations highlighted. The above recommended guidelines will be used as a basis for critically reviewing the scales used to assess the flow experience. In this review, only assessments developed in the English language were examined; assessments developed in other languages, such as the Flow Short Scale (Rheinberg et al., 2003), were excluded.

5.3.1 Interviews.

Initially, flow emerged from qualitative semi-structured interviews, which were likely critical in identifying the dimensions and dynamics of flow. However, interviewing is probably best suited for studies where rich and detailed information is required (Nakamura & Csikszentmihalyi, 2002). They are likely inappropriate, nor feasible for research requiring large samples. Little research on flow has been carried out using interviews, and this may be due to the expense, effort, and energy required from both researcher and participant (Delle Fave, Massimini, Bassi, & Fave, 2011). Interviewing also tends to identify the main events that stand out, or those that are most obvious, whilst ignoring other events that may also be of importance. Another limitation of interviewing is that the information collected relies on recall and participants may, therefore, either consciously vary responses due to expectations or social norms, or may not correctly remember events that actually happened (Massimini & Carli, 1988).

5.3.2 Diaries.

The use of diaries was trialled to better capture the full range of flow experiences and not just the most obvious ones. However, diaries also often require the use of recall, which places limitations on the accuracy of data (Massimini & Carli, 1988). Additionally, diaries can also be quite time consuming for participants to complete and for researchers to analyse.

5.3.3 Experience sampling method.

The experience sampling method (ESM), from here on referred to as event sampling to avoid confusion with the experience sampling form (ESF), was developed to study flow in everyday life (Massimini & Carli, 1988). It involves participants being equipped with electronic pagers that receive signals at random times of the day. Typically, participants are paged between seven to 10 times a day for a week, within a 15-18 hour day window; however, the timing of pages varies depending on the nature of what is being investigated. At the time the pager signals, the participant is asked to complete an ESF, which is said to take around 2 minutes to complete (Csikszentmihalyi & Larson, 1987). The ESF contains open ended questions regarding location, social context, activity, current thoughts, and Likert scales measuring affect, activation, cognitive efficiency, and motivation. However, the contents of the ESF are often changed depending on the nature of the research (Csikszentmihalyi & Larson, 1987).

Event sampling has a number of advantages: it provides both rich quantitative and qualitative information (Delle Fave et al., 2011), allows for non-laboratory, naturalistic setting research, the investigation of within-person processes, and reduces memory biases that are likely associated with retrospective self-report measures (Scollon, Kim-Prieto, & Diener, 2003). Despite the advantages of event sampling, there are also a number of disadvantages. Participating in event sampling research is quite an onerous task. It requires either carrying pagers and ESFs or PDAs. When pagers sound, it is disruptive to not only the participant but also likely to others around them. Furthermore, a large amount of time is required to participate in such research: With the above mentioned random interruptions of seven - 10 signals per day, over a seven day week, this equates to around two hours of participation and this excludes any training, practising, and debriefing, which is usually required before and after study participation (Csikszentmihalyi & Larson, 1987; Scollon et al., 2003).

Another limitation of event sampling is that the participants who agree to participate in event sampling research may not necessarily be representative of the population the researcher intended to study. For example, the more conscientious and agreeable may be more willing to be involved in such onerous research, and attrition may be experienced among those with low motivation levels. Additionally, even for those who do participate in event sampling research, the quality of their data declines over the study period, with it decreasing in variability, which may be due to habitual responding (Scollon et al., 2003). Furthermore, paging participants at random time points does not ensure that the data is obtained at random intervals, as it is the participant in the end who decides whether or not to respond when paged. There may also be instances where people are more likely to respond and instances where it may not even be possible to do so (Scollon et al., 2003). Therefore, event sampling data may not entirely reflect the duration of the responding period.

Participating in event sampling research may not be appropriate for employees who cannot afford to be repeatedly interrupted (e.g., surgeons). It may also interfere with, or inhibit the very phenomenon under investigation (Delle Fave et al., 2011). Additionally, reactivity to responses when administered many times a day may also be responsible for changes in behaviours and feelings that may not normally exist, which may lead to data not reflecting actual events or experiences. Although event sampling data may not be confounded by recall bias, it is still subject to social desirable responding, responding styles, and may also be influenced by cultural norms, similar to other self-report measures (Scollon et al., 2003).

In terms of reliability, Csikszentmihalyi and Larson (1987) have found that the frequency of activities recorded using event sampling correlate highly with the frequency of activities obtained from diaries (r = .93). In looking at the stability of activities overtime, further evidence of reliability was suggested as it was found that the frequency of activities in the first half of the week were similar to those found in the second half of the week (Csikszentmihalyi & Larson, 1987). However, it is unclear to the present researcher, nor documented, as to why the stability of the activities provides evidence of reliability. It would be more reasonable to expect that the frequency of activities would likely differ between days of the week (e.g., weekdays vs. weekends). Further evidence of reliability was also suggested as it was found that individual mean scores for the psychological states on the ESF (affect, activation, motivation, and cognitive efficiency) showed no significant change from the start of the week to the end (Csikszentmihalyi & Larson, 1987). However, again it is unclear to the researcher, nor documented, as to why this pattern would be expected. It has also been found that the variance in the second half of the week was less than the first. It has been suggested that this may be due to a more precise self-anchoring (Csikszentmihalyi & Larson, 1987). However, this may also be due to habitual responding, where over time people simply respond in the same manner as previously done (Scollon et al., 2003). In terms of the internal consistency of the mood items, which are considered indicators of flow (Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988), factor analysis revealed two factors: Affect (four items) and Arousal (five items), which had alpha levels of .57 and .48, respectively (Csikszentmihalyi & Larson, 1987). These obtained alpha levels suggest a large amount of error variance and according to DeVellis (2003) and Nunnally (1978) are unacceptable.

In terms of validity, there is evidence of convergent validity, with event sampling data found to be associated with physiological measures, retrospective measures, and behavioural indices. There is also evidence of known group validity, as differences have been found between clinical and non-clinical samples (Csikszentmihalyi & Larson, 1987). However, there is little evidence of construct validity for the actual indicators of flow (e.g., affect and arousal; Ellis, Voelkl, & Morris, 1994).

In event sampling research there is often little consistency between studies in terms of the content of the ESF, the frequency with which people are paged, and the duration of data collection (Csikszentmihalyi & Larson, 1987). Therefore, it would be inappropriate to assume that the validity and reliability established in one study could be replicated in another study, where the ESF and parameters have changed.

In terms of compliance, response rates vary from study to study, with it averaging around 80%. Reasons for non-compliance include: technical problems, forgetting the pager or ESF, and participants being unable to complete the ESF when paged (e.g., in the swimming pool; Csikszentmihalyi & Larson, 1987).

When using event sampling, many have proposed to measure flow as the "balance between high perceived challenges and skills" (Hektner, Schmidt, & Csikszentmihalyi, 2007, p. 93).

The ESF often contains two scaled items, "*challenges of the activity*" and "*your skills in the activity*". Participants respond to these two items using a scale ranging from 0 = *low* to 9 = *high* (Csikszentmihalyi & Csikszentmihalyi, 1988). Some researchers measure flow as above average levels on both the challenge and skill items (Delle Fave et al., 2011). Above average levels are identified by deviations above an individual's mean, however, this is somewhat problematic, as conceptually for flow to occur there also has to be a match between perceived challenges and skills (Csikszentmihalyi & Csikszentmihalyi, 1988). A very large standardised score on the challenge item and a small standardised score above the mean on the skill item, would suggest someone was in flow, despite there not being a match between challenge and skill (Ellis et al., 1994). Using the same two items, others have calculated flow scores differently. For example, Ellis and Voelkl (1994) used a scaling criterion approach to represent individual differences and found that it explained more variance in the subjective experience than the more traditional measure of above average challenges and skills. Hektner (as cited in Delle Fave et al., 2011) obtained flow scores using the geometric mean of challenges and skills. Moneta and Csikszentmihalyi (1996) measured the balance between challenges and skills by calculating their absolute difference. Ceja and Navarro (2009) and Guastello, Johnson, and Rieke (1999) scored flow by the cross-product of skill and challenge level for each task, divided by the cross product of the standard deviations (within-person) for skill and challenge.

There are two issues when using the perceived challenges and skills items to identify flow. Firstly, as can be seen in the paragraph above, there is a lack of consistency in the way that the challenge and skills dimension have been operationalised, which has led to differing results that deviate from theoretical expectations (Delle Fave et al., 2011). Secondly, and more importantly, the challenge and skills dimension is not a direct measure of the phenomenon itself. Schmidt, Shernoff, and Csikszentmihalyi (2007) state that it is "a proxy for flow – telling us only that, statistically speaking, flow may be more likely to occur" (p. 545). They further go on to suggest that in looking at flow, "it is necessary to consider multiple elements of the flow experience simultaneously in order to verify that the experiences we examine truly are flow experiences as defined descriptively" (p. 545).

In line with the above suggestion from Schmidt et al. (2007), researchers have attempted to measure flow using a composite score of items from the ESF. Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) measured flow by computing a composite score using three items on the ESF that tap into concentration, enjoyment, and interest. Schmidt et al. (2007) created a flow score based on the ESF items of concentration, enjoyment, interest, involvement, and control. Ceja and Navarro (2009) created a measure of flow using the composite of three items from the ESF: enjoyment, interest, and absorption. However, these approaches to flow are limiting, in that while they are considered to capture the multiple dimensions of flow, they do not capture all the dimensions of flow, as described by Csikszentmihalyi (2002). Additionally, using a single item to measure a latent construct (dimension of flow) is questionable. In order for reliable measurement, psychometric guidelines suggest that multiple items should be used to exhaust the possible ways of defining a latent construct (DeVellis, 2003).

Another limitation of event sampling is that it only records one's level of challenge and skill in relation to a specific activity when beeped. However, flow can be the result of anything that occupies one's attention (Csikszentmihalyi, 1988a, 1990). In other words, the flow experience can be the result of anything that is currently consuming one's physical, mental, or emotional energy, it is not just related to one's attention absorbed by a particular activity (Ellis et al., 1994).

5.3.4 The Flow Questionnaire.

The Flow Questionnaire was the first one time administration questionnaire developed by Csikszentmihalyi (1975); however, it has since been modified by Delle Fave and Massimini (1988). The questionnaire is divided into three parts and contains both scaled and open-ended questions. The first part introduces respondents to the nature of the flow experience by providing a number of quotations that describe the experience. Respondents are then asked if they have ever had such experiences and if so, to record them. Respondents are then asked to select the most intense and pervasive optimal experience and using a 9-point Likert-type scale (*very little* to *very much)*, rate 12 items tapping into their cognitive, affective, and motivational states. Sample items include, "*I am involved*", "*I enjoy doing this and using my skills*", and "*I wish I could do something else*" (negatively keyed; Delle Fave et al., 2011, p. 61). Using the same 12 items, respondents are asked to also rate their average daily experiences in domains such as work, family, alone time, and religious activities. Respondents are then asked to describe features and the meaning of their selected optimal experiences and daily experiences. In addition, four open-ended questions are used to investigate the conditions responsible for both the onset and continuation of their reported optimal experience (Delle Fave et al., 2011). In the second part of the flow questionnaire, 10 open-ended questions aim to assess the respondent's thoughts they would like to concentrate on, their thoughts when they have nothing to do, activities they would like/prefer to do, and conditions and situations that interfere with their thoughts and actions (Delle Fave et al., 2011). The third and last part of the questionnaire investigates anti-flow experiences, it contains two open-ended questions that ask respondents to identify experiences they have had, if any, that are the opposite of flow and how they felt. In the coding and analysis, open-ended questions are coded into functional categories based on the context of the question; that is, questions referring to activity types are meaningfully coded into domains such as work and leisure. The Likert-type scales, which are considered to investigate the features of flow, are analysed using conventional statistical tests (Delle Fave et al., 2011).

The Flow Scale provides both rich qualitative and quantitative information about flow, non-flow experiences, and even conditions that are conducive to flow. However, with regard to the Likert type scales, which are used to investigate flow, there is little established reliability and no known established validity. Although the items themselves are based on the dimensions detailed in flow theory, the scale also includes items that should be more appropriately defined as conditions to flow (e.g., feedback), thus confounding the actual flow experience. For example, someone could clearly know how well they are performing without necessarily being in flow. Also, as in the scales in the ESF, a single item is often used to reflect a dimension of flow, which is unlikely to adequately capture the latent variable of interest. Additionally, items have not been subjected to factor analysis and therefore it is unclear if the items actually represent a single flow factor. It is also noted that double barrelled items exist within the scale, for example, "*I enjoy doing this and using my skills*" (Delle Fave et al., 2011, p. 61).

5.3.5 Flow Experience Survey.

Using 56 newly created items based on research completed by Csikszentmihalyi (1975), the Flow Experience Survey was originally developed to assess flow experiences at work. The responding format consists of a 7-point scale ranging from *very unfavourable* to *extremely favourable*. Initial factor analysis (varimax rotation) revealed 15 factors that were subsequently factor analysed in a higher-order factor analysis (oblique rotation). Higher-order factor analysis revealed three factors, however, two factors were considered meaningful and therefore only these two were retained (i.e., Enjoyment and Control of Consciousness). Following item analysis, the Enjoyment factor consisted of 38 items and the Control of Consciousness factor consisted of 11 items. Cronbach's alpha coefficients for these two factors were .95 and .83, respectively (D. R. Anderson, Crous, & Schepers, 1996).

The Flow Experience Survey is not widely used and appears limited to only the authors themselves: A copy of this scale was not obtainable by the present researcher. In terms of the dimensionality of the scale, there was no interpretation of the 15 first-order factors that were extracted, although it was mentioned that negatively keyed items likely produced more factors (artificial factors) and therefore a higher-order factor analysis was attempted. Additionally, the higher-order factor structure does not appear to approximate simple structure, with a first-order factor (Subscore 12) cross loading on the two higher-order factors (i.e., Enjoyment and Control of Consciousness, .43 and .39, respectively). It was also unclear as to why the scale developers used a varimax rotation in the first-order factor analysis, given that the dimensions of the flow experience are likely to be related. Additionally in the development of this scale, it was mentioned that the questionnaire was presented in both English and also Afrikaans, however, it is not known whether the scale/item analyses were based on the English or Afrikaans version (D. R. Anderson et al., 1996).

In terms of construct validity, it was found that the Flow Experience Survey was positively related to quality of work life factors. There were no differences between males and females, which based on theory is to be expected given the universal nature of flow (Csikszentmihalyi & Csikszentmihalyi, 1988). However, the factorial validity is questionable, as in a subsequent study, factor analysis did not replicate the factor structure originally found (Percival, Crous, & Schepers, 2003). To improve the factor structure in this subsequent study, the scale was revised using the original 56 items and included 13 additional items intended for the Control of Consciousness factor. This revised version yielded 17 first-order factors (varimax rotation) and five higher-order factors (oblique rotation). However, due to sampling adequacy issues, four first-order factors were discarded and the revised factor analysis revealed a two factor solution. Item analysis of these two factors resulted in the retention of 31 items for the Enjoyment factor and 22 items for Control of Consciousness factor. Cronbach's alpha coefficients were .95 and .92, respectively (Percival et al., 2003). A third study using the initial revised version item pool (original 56 items plus 13 additional items) of the Flow Experience Survey, revealed a different higher-order factor structure, although the two same dimensions were obtained. The first factor (i.e., Enjoyment) contained 26 items while the second (i.e., Control of Consciousness) had 39 items. Cronbach's alpha coefficients were .92 and .94, respectively (Havran, Visser, & Crous, 2003). However, it is unclear why the researchers used the initial item pool from the earlier revised version and not the items that were retained from item and factor analysis.

As the items of the questionnaire were not obtainable by the present researcher, it was not possible to comment on the content validity of this scale. In the interpretation of the two factors (i.e., Enjoyment and Control of Consciousness), there is some concern as to whether these two scales adequately capture all the dimensions said to resemble flow (e.g., merging of action and awareness, loss of self-consciousness, and transformation of time). Moreover, the enjoyment dimension, as discussed later in this thesis (see Chapter 6, page 76), may not appropriately reflect the experience of flow, as enjoyment is likely best viewed as a by-product of flow (Csikszentmihalyi, 1975, 1988a), and it is possible for someone to experience enjoyment in non-flow activities.

5.3.6 Short Flow Scale.

The Short Flow Scale aimed to provide a brief, reliable, and valid measure of flow that can be applied to different domains (e.g., work, sport, and music). The scale consists of nine items that were selected from the Long Flow Scales, primarily used to measure flow in physical activity (S. A. Jackson & Eklund, 2002; S. A. Jackson & Marsh, 1996). Each item represents one of the nine dimensions of flow as described by Jackson and Marsh (1996): challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration on the task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience. Item selection was based on a combination of factor loadings from the Long Flow Scales and good content validity (Martin & Jackson, 2008). Items are rated on a 7-point Likert scale, 1 = *strongly disagree* to 7 = *strongly agree*. An example item is, "*I have a feeling of total control*" (Martin & Jackson, 2008, p. 155). As this critical review focuses on measures suitable for the work context, only the established reliability and validity of the Short Flow Scale within the work domain are presented here. In terms of reliability, the Short Flow Scale obtained an acceptable Cronbach's alpha coefficient of .73. A confirmatory factor analysis (CFA) showed that there was an acceptable fit between the hypothesised model and data. Loadings for the nine items onto a global Flow factor ranged from .23 - .73 (Martin & Jackson, 2008). In terms of construct validity, the Short Flow Scale was found to be related to motivation and engagement constructs. Invariance between factor loadings across different samples was also found, providing additional support for the scale's validity (Martin & Jackson, 2008).

There are, however, some issues with the Short Flow Scale. Firstly, in the development of the scale, an exploratory factor analysis (EFA) should have been performed prior to CFA (Worthington & Whittaker, 2006). Worthington and Whittaker (2006) state that, rather than simply confirming a proposed factor structure, an EFA should be used to determine the dimensionality of the set of items of a scale, regardless of how well the scale developer expects their selected items to measure intended factors. An EFA also enables the scale developer to easily identify items that do not measure their intended factor or items that also may measure multiple factors (Worthington & Whittaker, 2006). Similarly, B. M. Byrne (2001) also states that the "...application of CFA procedures to assess instruments that are still in the initial stages of development represents a serious misuse of this analytic strategy" (p. 99). Another issue is that although there was an acceptable fit between the proposed model and data, the factor loadings of two items "*I do things spontaneously and automatically without having to think*" and "*I am completely focused on the task at hand*" (Martin & Jackson, 2008, p. 155) were substantially low: .25 and .23, respectively. In terms of item wording, it was noted that a double barrelled item also exists, "*I do things spontaneously and automatically without having to think*" (Martin & Jackson, 2008, p. 155), which conveys two meanings – spontaneously and automatically.

In terms of content validity, it was noted that there are some items that may not appropriately reflect the flow experience. For example, the item, "*I feel I am competent enough to meet the high demands of the situation*" (Martin & Jackson, 2008, p. 155), does not necessarily reflect an appropriately challenging situation where one's skills are stretched; rather it simply assumes one has the necessary skills to meet the high demands of a situation. The item, "*I do things spontaneously and automatically without having to think*"(Martin & Jackson, 2008, p. 155), does not necessarily reflect the flow experience, as it can also be strongly endorsed by someone who is participating in an easy activity, which requires little psychic energy. A possible explanation for this error is that the items were derived from the original Long Flow Scales where the context setting is flow specific, whereas in the Short Flow Scale it is not. In the original scale, participants are instructed to respond to items based on an optimal experience they have had during sport participation, defined as, "one where you were totally absorbed in what you were doing, and which was very enjoyable" (S. A. Jackson & Marsh, 1996, p. 22). In the original scale, participants who do not experience flow are excluded (S. A. Jackson & Marsh, 1996). However, in the Short Flow Scale, respondents are asked to respond to the same items based on their experience regardless of whether they were in flow or not. When developing the Short Flow Scale, the effect of changing the context from a specific flow experience to a general activity, may have been overlooked.

A further issue is that the items based on the nine dimensions of flow, said to represent a global flow score, include items that more likely resemble the conditions to flow, which likely confound the flow score. For instance, the control item, "*I have a feeling of total control*"; feedback item, "*I have a good idea while I am performing about how well I am doing*"; and the clear goal item, "*I have a strong sense of what I want to do*" (Martin & Jackson, 2008, p. 155), can also be experienced and highly endorsed by someone who is not in flow. In addition, as discussed in more detail later in this thesis (see Chapter 6, page 76), the autotelic experience, although mentioned as a dimension of flow, has been more appropriately described as a by-product of the flow experience itself (Csikszentmihalyi, 1975, 1988a) and therefore should not be seen as a dimension of flow itself.

Lastly, although the authors of the Short Flow Scale have made a cogent argument for the development of a brief scale, the flow construct is multidimensional. Having a brief scale measure a multidimensional construct, where a single item represents a dimension (latent variable) of flow is likely psychometrically inappropriate. For example, in this scale, the item measuring the clear goals dimension, "*I have a strong sense of what I want to do*" (Martin & Jackson, 2008, p. 155), does not fully reflect the clear goals dimension. It implies that goals need to be clearly defined prior to undertaking the activity. However, in the flow model, for flow to occur, clear goals do not necessarily have to be established prior to commencing an activity, they can also be created during the activity. For instance, an artist in flow, may not necessarily know what his/her finished painting will look like until after he/she has begun painting (Csikszentmihalyi, 2002).

5.3.7 Core Flow Scale.

The Core Flow Scale aimed to capture the "real time" subjective experience of flow itself. This scale consists of 10 items that were developed from qualitative research describing elite athletes' experience of flow (S. A. Jackson, 1992, 1995, 1996). A total of 10 items were developed that incorporated elite athletes expressions of what it felt like to be in flow. An example item is: "*It feels like 'everything clicks'*" (Martin & Jackson, 2008, p. 155). Items are rated on a 1 = *never/strongly disagree* to 5 = *always/strongly agree* rating scale. The Core Flow Scale has two versions, a state (i.e., particular events just participated in) and a dispositional version (i.e., how one generally feels in a given activity; Martin & Jackson, 2008). Although the Core Flow Scale is intended for multiple domains, there is currently no established evidence of reliability and validity in the work context, and therefore none are reported here.

Apart from the lack of established reliability and validity in the work context, there are a number of other concerns with this scale. The scale originated from descriptions of flow given by elite athletes (i.e., "in the zone"), which may not necessarily be recognisable as flow experiences in other domains and even among non-elite athletes. Therefore, the scale may not be appropriate for samples other than elite athletes. The scale is also said to represent the real time experience of flow, however, it does not directly attempt to assess all the originally identified dimensions of flow (i.e., transformation of time and loss of self-consciousness), which occur during real time flow experiences (Csikszentmihalyi, 2002).

It is also noted that there are issues with the content validity of this scale. The item, "*I feel in control*" (Martin & Jackson, 2008, p. 155), may not appropriately reflect the flow experience, as one can also feel in control in non-flow experiences (i.e., easy non-challenging activities). Additionally, the item, "*It feels like I am 'in the flow' of things*" (Martin & Jackson, 2008, p. 155), may also be incorrectly interpreted as the more traditional meaning of flow, that is, simply going with the flow, which is quite different to the meaning of the flow experience being measured. Furthermore, it was not reported whether the scale's items were reviewed by others who were familiar with the flow construct, and items were also not selected from a large initial item pool. Similarly, like the Short Flow Scale, items were not subjected to EFA, but rather a CFA was used to confirm the proposed factor structure – issues with performing a CFA prior to EFA have been previously discussed, see pages 62 -63.

5.3.8 Work-Related Flow Inventory.

The Work-Related Flow Inventory (WOLF for short) aimed to measure the frequency of flow at work (A. B. Bakker, 2008). According to the author of the scale, flow at work is seen as "a short-term peak experience at work that is characterised by absorption, work enjoyment, and intrinsic motivation"(A. B. Bakker, 2005, p. 400). Absorption refers to total concentration and immersion in one's work. It is where the passage of time appears to go faster than normal and where everything else is forgotten. Work enjoyment refers to feelings of happiness and positive judgements about one's life at work. Intrinsic motivation refers to one's interest in carrying out an activity because it is rewarding in and of itself (A. B. Bakker, 2005). An original set of 16 items were generated and reviewed for content validity by five organisational psychologists. EFA and reliability analysis revealed a set of 13 items and three dimensions were seen to represent flow: Absorption (four items), "*When I am working, I think about nothing else*"; Work Enjoyment (four items), "*My work gives me a good feeling*"; and Intrinsic Motivation (five items), "*I would still do this work, even if I received less pay*" (A. B. Bakker, 2005, p. 412). Respondents rate each item using a 7-point scale, 1 = *never* to 7 = *always*.

CFA from six samples provides further evidence that the three dimensional model is acceptable. In terms of reliability, Cronbach's alpha coefficients taken from seven samples, range from: .75 to .86 for Absorption, .88 to .96 for Work Enjoyment, and .63 to .82 for Intrinsic Work Motivation (A. B. Bakker, 2008). In terms of validity, all three subscales (Absorption, Work

Enjoyment, and Intrinsic Work Motivation) of the WOLF have medium to large correlations with a general index of flow and job satisfaction. Job characteristics (i.e., work pressure, emotional demands, autonomy, social support from colleagues, and opportunities for self-growth) explained 18.7%, 28.3%, and 20.9% of the variance in Absorption, Work Enjoyment, and Intrinsic Work Motivation, respectively (A. B. Bakker, 2008), providing evidence of construct validity for the three WOLF subscales. There is also evidence of predictive validity, with Work Enjoyment being a predictor of in-role performance, and Intrinsic Work Motivation being a predictor of extra-role performance. Absorption was not found to be a predictor of in-role performance; it was not examined whether it would be a predictor of extra-role performance (A. B. Bakker, 2008).

Although the WOLF scale has sound psychometric properties and was developed appropriately, the dimensions of the WOLF scale are not a direct attempt to measure the flow experience itself. As mentioned previously and discussed in more detail in Chapter 6 (page 76), enjoyment is more appropriately seen as a by-product or outcome of experiencing flow (Csikszentmihalyi, 1975, 1988a) and can also be experienced within non-flow activities. Additionally, the three factors of the WOLF scale do not assess all the experiential dimensions of flow originally found in interviews (e.g., loss of self-consciousness, merging of action and awareness, and transformation of time); albeit the transformation of time is referred to in the description of the absorption dimension, but is not specifically measured. Another concern is that intrinsic motivation, one of the three subscales of the WOLF, is likely a possible confounding variable, as it is possible for someone to be intrinsically motivated, yet not be experiencing flow (i.e., intrinsically motivated in an activity that is not appropriately challenging).

5.3.9 Nielsen Flow Scale.

In a recent study, Nielsen and Cleal (2010) developed a nine item flow scale that aimed to better capture the experiential state of flow. This scale aimed to exclude the antecedents to flow that are often found in other flow measures, which confound the measurement of the flow experience. Additionally, it is also suggested that this nine item scale captures the broader range of characteristics experienced when in flow. This scale is used as part of the event sampling method, where the respondent completes the scale every time he/she is paged. Example items include, "*Did you feel in control of the situation?*", "*How active did you feel when you were beeped?*", and "*How clear on what you were doing did you feel?*" (Nielsen & Cleal, 2010, p. 184). Items are rated on a 5-point Likert type scale, 1 = *not at all* to *5 = to a very large extent*. A CFA was performed to assess the factor structure and confirmed that items loaded onto a single Flow factor. The obtained Cronbach's alpha coefficient for this scale was .85 (Nielsen & Cleal, 2010).

The concerns with this scale are that the initial item pool did not contain a larger set of items than the intended final scale, and as there was no indication that the items were reviewed by others, it was therefore assumed that this did not take place. Additionally, the initial developmental sample was small (*N* = 58) and was limited to a specific of occupation (i.e., line manager). Furthermore, no EFA was carried out on the set of items but rather a CFA was performed (issues with performing a CFA prior to EFA have been previously discussed, see pages 62-63). The small sample size used in this study is well below the generally recommended sample size of 300 for conducting CFA. A small sample size tends to result in less reliable correlation coefficients (Tabachnick & Fidell, 2007).

In terms of the content validity of this scale, although the scale developers aimed to better capture the experiential state of flow, it appears that some items may also be capturing non-flow experiences. For example, the items, "*Did you feel in control of the situation?*", "*To which degree did you feel you succeeded at what you were doing?*", and "*How clear on what you were doing did you feel?*" (Nielsen & Cleal, 2010, p. 184), could also be strongly endorsed by someone who is doing an easy, non-challenging task (i.e., a non-flow activity). Additionally, being in control of the situation and receiving clear goals are also likely better seen as conditions to flow and not the flow experience itself. The two items that appear to assess the balance between challenge and skills dimension of flow: "*To which degree did you use your skills?*", and "*To which degree did you feel challenged by the activity?*" (Nielsen & Cleal, 2010, p. 184), unlikely capture the appropriate balance or stretching of one's skills. Endorsing either one of these items could imply that he/she may have been either "under-skilled" or "over-challenged". The meaning of "active" in the item "*How active did you feel when you were beeped?*" (Nielsen & Cleal, 2010, p. 184), is more likely to be interpreted as being physically active, rather than mentally active; mental activity should also be considered a possible flow experience (e.g., attentional resources used when playing chess). The item assessing enjoyment, "*To which degree were you enjoying what you were doing?*" (Nielsen & Cleal, 2010, p. 184), can also be endorsed by someone not in flow; performing an easy job (i.e., a non-flow activity) may be seen as enjoyable. Additionally, as mentioned earlier and discussed in more detail in Chapter 6 (page 76), the enjoyment dimension of flow is more appropriately seen as a by-product of flow (Csikszentmihalyi, 1975, 1988a). Lastly, although this nine item scale aimed to better capture the experiential state of flow more so than previous existing measures, not all of the dimensions identified in flow theory are included in this scale (i.e., transformation of time, merging of action and awareness, and loss of self-consciousness).

5.3.10 The Flow State Scale-2 and Dispositional Flow Scale-2.

The Flow State Scale-2 (FSS-2) was designed to measure a situation-specific experience of flow and the Dispositional Flow Scale-2 (DFS-2) was intended to measure the frequency with which people experience flow in a particular physical activity (S. A. Jackson & Eklund, 2004). Although both scales were designed to measure flow experiences in physical activity, items from these scales and modified scale versions have been used to assess flow experiences in the workplace (e.g., Deitcher, 2011; Forest, Mageau, Sarrazin, & Morin, 2011; Fullagar & Kelloway, 2009; Quinn, 2005).

Each scale consists of 36 items, with 4 items representing each of the nine flow dimensions as described by Csikszentmihalyi (1990); challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration on task, sense of control, loss of self-consciousness, time transformation, and autotelic experience. For the FSS-2, respondents rate each item using a 5-point scale, 1 = *never* to 5 = *always*. The DFS-2 utilises a 5-point Likert scale, 1 = *strongly disagree* to 5 = *strongly agree* (S. A. Jackson & Eklund, 2004).

Both the FSS-2 and DFS-2 have established evidence of factorial validity (S. A. Jackson & Eklund, 2004). However, this has primarily been established using athletes who participated in sport/physical activity (Delle Fave et al., 2011). Confirmatory factor analyses have revealed an acceptable first and higher-order model providing support for the interpretation of the nine intended dimensions of flow and also a global higher-order flow scale (S. A. Jackson & Eklund, 2004). A concern with the validity of these scales is that the items were never subjected to an EFA, which is the recommended procedure for newly developed items, as previously mentioned (see pages 62-63). Another concern is that for the FSS-2, the transformation of time factor has a relatively weak factor loading (.21; S. A. Jackson & Eklund, 2002). Both scales have been found to be reliable with reported Cronbach's alpha coefficients ranging from .80 to .92 for the FSS-2 and .78 to .90 for the DFS-2 (S. A. Jackson & Eklund, 2002).

In terms of content validity, there are number of concerns with both scales. A number of the dimensions are more likely conditions (i.e., challenge skill-balance, clear goals, unambiguous feedback, and sense of control) or an outcome (i.e., autotelic experience) to flow rather than facets of the flow experience. These antecedent and outcome dimensions are likely to confound the measurement of flow as items within these scales could be highly endorsed by someone who was not in flow. For example, the items "*I know clearly what to do*", *"I have a sense of control* *over what I am doing", "I really enjoy the experience", "I have a strong sense of what I want to do", "I have a feeling of total control"* could all be highly endorsed by someone who was participating in easy, non-challenging (i.e., non-flow like) activities.

Another concern is the suitability of the scales for the workplace. Both scales were initially developed to assess flow experiences in physical activity. A number of items specifically relate to physical activity, "*I make the correct movements without thinking about trying to do so*" and "*I feel in total control of my body*", and therefore do not include mental activity, which should also be considered when examining flow experiences at work. Additionally, the developmental samples and validity studies primarily consisted of athlete's participation in physical activity. Therefore the psychometric properties obtained are unlikely generalisable to other contexts (e.g., the work environment). Further evidence suggesting that the scales may not be suitable for the workplace is that researchers have often modified the scales to suit the workplace context (e.g., Deitcher, 2011; Forest et al., 2011; Fullagar & Kelloway, 2009; Quinn, 2005). At the item level, it is also noted that double barrelled items exist, where two ideas are presented in the one item: "*I love the feeling of the performance and want to capture it again*" and "*I do things spontaneously and automatically without having to think*".

5.4 Conclusion

From this chapter it can be seen that there are a number of concerns with the current methods for assessing flow in the workplace. Although the majority of assessments report some evidence of established reliability and validity, it was revealed upon a rigorous and detailed inspection that there were many concerns surrounding the reliability and validity of these assessments.

Of the scales that have evidence of reliability, few have established evidence of reliability in the work context. Moreover, developmental samples are often specific to a particular domain other than work (e.g., sport/physical activity) and it would be inappropriate to assume that the reliability obtained in a non-work domain would be generalisable to the work domain.

Flow is typically operationalised as a higher-order unidimensional variable and many factor analytic studies have confirmed the presence of a unidimensional flow variable, which provides support for the interpretation of a single global flow construct (S. A. Jackson & Eklund, 2002, 2004; S. A. Jackson & Marsh, 1996; Martin & Jackson, 2008; Nielsen & Cleal, 2010). However, many scales have often subjected items to a CFA rather than an EFA and as a CFA only tests the appropriateness of a proposed model, it is therefore not known if a more appropriate underlying factor structure is present. Consequently, initial factor structures obtained using CFA have not adequately been assessed and their factorial validity remains questionable.

Of the reviewed scales, few adhered to recommended guidelines in scale development. Many scales did not have initial item pools larger than their intended final scale and few had items reviewed by other professionals familiar with the construct. This lack of careful item selection and review has likely resulted in many problematic items remaining in final scales (i.e., double barrelled items and items that also capture non-flow experiences), which may explain their psychometric shortcomings.

A major concern found in this review is the way in which flow has been operationalised. Scales either assess flow by measuring an antecedent (i.e., balance between challenge and skill) of flow (e.g., Experience Sampling Method), a combination of flow characteristics and outcomes (e.g., Flow Experience Survey), or a combination of antecedents, flow characteristics, and outcomes (e.g., The Flow Questionnaire, Short Flow Scale, Core Flow Scale, WOLF, Nielsen Flow Scale, FSS-2, and DFS-2). It can be seen that none of the existing measures of flow appropriately capture the complete experiential state of flow at work without confounding variables (e.g., antecedents or an outcome of flow). Nielsen and Cleal (2010) have suggested that more research is needed to better operationalise the flow experience and also the conditions for flow. Furthermore, Shin (2006) acknowledges that conceptualisations of flow often incorporate both antecedents and outcomes of flow, rather than just the flow experience itself.

From this review it can be concluded that there are no suitable scales that appropriately capture the flow experience at work. The present thesis aims to address this issue and researchers' calls to better operationalise the flow construct, by using a rigorous scale development process that follows the most recent recommended guidelines, to develop scales to assess the conditions to flow and flow experience at work. More specifically, this thesis aims to: (a) examine which of the dimensions identified in flow theory should represent the conditions to flow or flow experience; (b) develop a new appropriate set of scales to assess the conditions to flow and the flow experience for the workplace; (c) and investigate the scales reliability and validity through a series of studies. It is argued that this rigorous scale development process will yield scales with superior psychometric properties to that of existing scales and result in a more valid and reliable measure of flow that is suitable for the workplace.

Chapter 6

Development of the Conditions to Flow and Flow Scales

6.1 Overview

The previous chapter highlighted a number of concerns with the currently available methods for assessing flow at work and concluded that there is no reliable and valid scale that adequately captures the flow experience. A main concern was that the measurement of flow was often confounded by the measurement of the antecedents or the outcome of flow. In the present chapter, the researcher looks again at the originally identified dimensions of flow and discusses which of these dimensions should be seen as antecedents of flow, as the flow experience itself, and as the outcome of flow. Once a clearer understanding of the constructs of interest has been established, this chapter then reports on the development and evaluation of a scale to measure the conditions to flow and a scale to measure the flow experience.

6.2 Introduction

As mentioned in Chapter 3, Csikszentmihalyi and his students found that, irrespective of activity, people who participated in intrinsically rewarding activities reported a number of common experiences. These experiences subsequently became known as the dimensions of flow (Csikszentmihalyi, 1988b) and have been consistently found across a wide range of activities, classes, cultures, genders, and ages (Nakamura & Csikszentmihalyi, 2002). As detailed in Chapter 3, the dimensions of flow include a balance between challenge and skills, clear goals, unambiguous feedback, control, merging of action and awareness, deep concentration, loss of self-consciousness, transformation of time, and autotelic experience. It is argued by the present researcher that not all these dimensions represent the flow experience itself and that some of these dimensions are more likely to represent either antecedents or the outcome of flow. The idea that some dimensions of flow can potentially be seen as antecedents and one of them may be a possible outcome of flow has previously been suggested by Csikszentmihalyi (1975, 1988a) and Nakamura and Csikszentmihalyi (2002). However, it appears that few researchers clearly make this important distinction. To address this issue, the present researcher aims to describe here which dimensions represent the conditions to flow, which correspond to the flow experience itself, and which is the outcome of flow.

6.2.1 Conditions to flow.

The following four dimensions are suggested to represent the conditions to flow, rather than the flow experience: balance between challenge and skills, clear goals, feedback, and control. To date, flow research has largely been correlational and, therefore, cause and effect relationships between the conditions to flow and the flow experience are limited (Keller & Bless, 2008). However, some support for these four dimensions as being conditions to flow is provided below by using theoretical arguments found in the literature as well as studies that provide evidence of an association between each of the proposed conditions to flow and the flow experience.

6.2.1.1 Balance between challenge and skills.

For flow to occur, it is necessary for one's skills to be appropriately stretched. That is, they should not be underutilised, overmatched, or exactly matched (Nakamura & Csikszentmihalyi, 2002). Without appropriately stretching their skills, a person is unlikely to experience flow. Further, depending on the degree of imbalance between challenge and skills, they may be more likely to experience relaxation, frustration, boredom, anxiety, or worry. In particular, if perceived skills are greater than the demands of the task, the person is unlikely to experience flow and, depending on the degree of imbalance, is more likely to experience relaxation, then boredom, and eventually anxiety. Likewise, if the perceived demands of the task are greater than perceived skills, then the person is also unlikely to experience flow and is more likely to experience frustration, then worry, and eventually anxiety (Csikszentmihalyi, 1997). Similarly, if there is a match between low skills and low challenges, one is unlikely to experience flow and is more likely to experience boredom (Massimini & Carli, 1988). However, if one perceives that their skills are appropriately challenged (i.e., skill stretching), then they are likely to enter into an optimal state of flow.

Support for the contention that the appropriate challenge dimension should be seen as a condition to flow can be found in the related work motivation literature (reviewed in Chapter 4). The JCM, suggests that tasks requiring a large number of skills (i.e., challenging activities) will result in increased levels of motivation and engagement (Oldham & Hackman, 2010). Additionally, GST also states that when goals are set at a high level and one has the necessary skills to obtain the goal, performance will be at its best (Locke & Latham, 2002). Given that the flow experience involves a complete engagement in the task at hand, where one performs at their peak

(Nakamura & Csikszentmihalyi, 2002), it is likely that, appropriate task challenge also facilitates the flow experience.

There is empirical evidence to suggest that the appropriate challenge dimension is related to flow. Bryce and Haworth (2002) and Nielsen and Cleal (2010) both found that activities believed to be appropriately challenging (e.g., planning and problem solving) were significantly positively associated with flow. Bryce and Haworth (2002) measured flow by presenting a description of a flow experience and asking participants to rate how often they experienced a similar state and Nielsen and Cleal (2010) measured flow using a nine item scale representing some of the originally identified dimensions of flow (i.e., appropriate challenge, clear goals, feedback, control, deep concentration, and autotelic experience). Fullagar, Knight, and Sovern (2012) found in a longitudinal study among student musicians that, the appropriate challenge dimension was associated with flow experiences, which was measured using six items that were adapted from the FSS-2 (S. A. Jackson & Eklund, 2004). These items were said to measure enjoyment, concentration, merging of action and awareness, loss of self-consciousness, transformation of time, and control. Furthermore, in an experimental study, where the level of challenge was manipulated, participants who were in the appropriately challenged condition, reported significantly more flow experiences than those who were not in the appropriate challenged conditions (Keller & Bless, 2008). Keller and Bless (2008) measured the flow experience by assessing participants perception of time, enjoyment, and deep involvement. Perception of time was measured using a 10cm horizontal line with end points *very short* to *very long*. Enjoyment and deep involvement in the activity were measured using a 14-item scale.

6.2.1.2 Clear goals.

It is difficult for one to get absorbed in an activity if one does not know what to do (Csikszentmihalyi, 1988a). Clear goals allow one to decide what action to take and what action not to take. Having clear goals that do not contradict one another helps to facilitate the flow experience (Csikszentmihalyi, 1975). Similarly, in the related work motivation literature, the JD-R states that role clarity, having clear goals, is responsible for employee engagement, which as argued in Chapter 4 is a similar construct to the flow experience (A. B. Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). Furthermore, GST states that clear goals enhance motivation and engagement by directing attention to relevant tasks and away from unnecessary action or activity (Locke & Latham, 2002). Empirical evidence also suggests a relationship between clear goals and flow. Salanova, Bakker, and Llorens (2006) found that clear goals positively influence flow among teachers.

6.2.1.3 Unambiguous feedback.

Feedback is necessary in order to determine how one is performing in a given activity (Csikszentmihalyi, 2002). Without it, one is less likely to experience flow. Additionally, the flow experience is likely to be interrupted if feedback ceases to exist, as one starts to question one's actions. This breaks the intense and focused concentration typical of the flow experience. Similarly, the JCM, a similar theoretical framework to flow (See Chapter 4), states that feedback that is direct and provides clear information about how one is performing, is a predictor of work motivation (Hackman & Oldham, 1976). This model has undergone extensive testing and empirical studies provide evidence of its validity as a model (De Varo et al., 2007; Fried & Ferris, 1987; Hackman et al., 1975) .

Empirical evidence has revealed that feedback is associated with flow. Using a sample of music teachers, A. B. Bakker (2005) found that performance feedback in the workplace was conducive to flow, which was measured using the WOLF scale (see page 65 for details of this scale). Additionally, Demerouti (2006), using the same scale, also found that feedback was related to flow among employees from a range of sectors and job positions.

6.2.1.4 Control.

Csikszentmihalyi (1999) states that one has to be in control of the activity if they are to experience flow. Flow activities make control possible; they are constructed in such a way that they allow one to develop sufficient skills to almost completely remove the possibility of error (Csikszentmihalyi, 2002). Not being in control of the situation requires attention to be diverted away from the task at hand as one may have to deal with an unexpected event. This disruption would break the intense focused attention, smooth effortless movement of action, and order of consciousness, which are all characteristics of the flow experience. For example, one is unlikely to experience flow crossing a busy city street where there are a number of unpredictable taxi, bus, and car drivers (Csikszentmihalyi, 2002). However, an artist is more likely to experience flow when painting, as there are few unexpected events that occur while painting and he/she has the necessary skills. In this scenario, the artist has complete control over the paintbrush and canvas.

Empirically, A. B. Bakker (2005) found that job control contributed to the experience of flow. Similarly, in other work motivation research, control is seen to be a predictor of work motivation. For example, in the employee engagement literature, control is seen as an antecedent to employee engagement (Maslach et al., 2001) and research has found that control was significantly positively related to employee engagement (A. B. Bakker et al., 2007; Hakanen et al., 2006; Mauno et al., 2007).

The control dimension should not be seen as a facet of flow as it is possible to experience control in non-challenging activities (i.e., non-flow activities). If the control dimension is included as a facet of flow, it has the potential to confound the measurement, as items assessing one's level of control could be highly endorsed even when someone is not in flow.

6.2.2 The flow experience.

It is suggested that the four dimensions described above that represent the conditions to flow (appropriate balance between challenge and skills, clear goals, feedback, and control), facilitate the following four dimensions of the flow experience: merging of action and awareness, deep concentration, loss of self-consciousness, and transformation of time. The suggestion that these four dimensions represent the experiential state of flow has also been proposed by other researchers (Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005; Fullagar et al., 2012; Nakamura & Csikszentmihalyi, 2002, 2009). These dimensions are detailed further below.

6.2.2.1 Merging of action and awareness.

Merging of action and awareness is seen as a characteristic of flow, as it represents an experience of flow where one has no dualistic perspective between action and awareness. One cannot see the activity from outside the activity itself. In other words, during the flow experience, one does not stop to reflect on the awareness of the activity itself. Additionally, the lack of available psychic energy does not allow one to recognise the large amounts of physical or mental energy expended and as a result, actions feel almost automatic and effortless (Csikszentmihalyi, 2002). The notion of effortless attention has also been recognised in other similar positive experiential constructs such as peak experience (Maslow, 1971) and peak performance (Privette, 1981).

6.2.2.2 Deep concentration.

Deep concentration is seen as a characteristic of flow as it represents the intense and focused concentration experienced during flow; where one forgets about their worries and frustrations of everyday life. In typical everyday activities, concentration is rarely this intense and there is available psychic energy to think about everyday worries and frustrations (Csikszentmihalyi, 2002). A high level of concentration is also a central defining characteristic of other similar positive experiential constructs, such as employee engagement (Macey & Schneider, 2008; Schaufeli & Bakker, 2004), absorption (Tellegen & Atkinson, 1974), peak performance (Privette, 1981), and peak experience (Maslow, 1971).

6.2.2.3 Loss of self-consciousness.

Loss of self-consciousness is seen as a characteristic of flow as it represents the experience of losing a sense of "self", which occurs during the flow experience. This loss of self also allows one to feel connected to his/her environment, which has also been identified as a common experience of flow (Csikszentmihalyi, 2002). This experience differs from typical everyday life where we often spend a considerable amount of time focusing on ourselves. The loss of self-consciousness dimension is also a characteristic of peak experience (Blanchard, 1969), which, as discussed in Chapter 3, is a similar construct to flow.

6.2.2.4 Transformation of time.

Transformation of time is seen as a characteristic of flow, as it was noticed that during the flow experience most people were not aware of how fast time had passed and for some, the flow experience resulted in time passing slower than normal. In general, it appears that the flow experience alters one's perception of the passage of time (Csikszentmihalyi, 2002).

6.2.3 Outcome of flow.

6.2.3.1 Autotelic experience (enjoyment).

The flow experience is said to be autotelic, in that it is rewarding in and of itself (i.e., intrinsically rewarding; Csikszentmihalyi, 2002). Although listed as a dimension of flow, the autotelic experience is more likely best represented as a by-product or outcome of flow (Csikszentmihalyi, 1975, 1988a, 1997). Experiencing an activity as being intrinsically rewarding is due to both cognitive and affective evaluations of the experience (Diener, 2000; Diener & Diener, 1996), which can only be processed after the flow experience, as when in flow one has little to no psychic energy available to process anything but the demands of the activity. It is for this reason that the flow experience is not seen as intrinsically rewarding at the time.

6.3 Study 1: Initial Development and Evaluation of the Conditions to Flow and Flow Scales

6.3.1 The aim of the present study.

To summarise, the flow model presented in this research incorporates a set of antecedents or conditions to flow that include: the balance between challenge and skills, clear goals, unambiguous feedback, and control. It is proposed that these conditions facilitate the flow experience, which is represented by the following dimensions: merging of action and awareness, deep concentration, loss of self-consciousness, and transformation of time. A by-product or outcome of the flow experience is that the activity is seen as autotelic. It is argued that by adopting this model, a more appropriate scale can be developed that accurately captures the experiential state of flow. Previous measures of flow often contained items that assess both the conditions and outcomes of flow (i.e., autotelic experience), which confounds the measurement of flow.

In Chapter 5 of the present thesis, all suitable methods for assessing the flow experience at work were reviewed, showing that there is currently no suitable, reliable, and valid way to measure the flow experience at work. The present chapter also has appropriately described which dimensions should be seen as antecedents of flow, as constituting the experience of flow, and as the outcome of experiencing flow, respectively. Having shown that there is a need to develop a reliable and valid measure of flow at work and having a clearer understanding of the phenomenon of interest, the present study aims to develop two scales for the workplace; one that measures the conditions to flow and the other that measures the flow experience.

6.3.2 Method.

6.3.2.1 Initial scale development.

In line with the most recent guidelines in scale development available at the time (DeVellis, 2003), the present researcher self-generated items using the most established theoretical model of flow. It is important to reiterate here that the model of flow being referred to is the original account of flow based on countless extensive interviews by Csikszentmihalyi and colleagues (Nakamura & Csikszentmihalyi, 2002). However, the present researcher modified this original model by refining the dimension of balance between challenge and skills. This modification was substantiated on Massimini and Carli’s (1988) research showing that, for flow to occur, perceived challenges must be above average for the individual and he/she must have the necessary skills, rather than there being a balance between skills and challenges.

Utilising the descriptions of the dimensions identified in flow theory, items were developed by the present researcher for each of the dimensions to and of flow. These items were evaluated independently by five other researchers familiar with the flow construct. Evaluators provided feedback on item wording, the relevance of items to their intended dimension, and suggested revisions. Items that were not seen as relevant were excluded and replaced with suggested revisions. Items that were flagged as poorly worded were also revised in consultation with evaluators.

The evaluation of the items resulted in the selection of 23 items for the Conditions to Flow Scale, and 19 items for the Flow Scale (see Appendix A-1). As recommended by scale development guidelines, the initial item pool contained more items than what was planned to make up the final scale and it was expected that no less than three items would comprise each dimension. Example items for each of the condition dimensions to flow were: balance between challenge and skills, "*I engage in activities that appropriately challenge my capabilities"*; clear goals, "*I have clear goals before I engage in an activity"*; feedback, *"I get/receive feedback towards goals/activities I set";* and control, *"I'm able to perceive that I have control over the activity or situation at hand"*. Example items for each of the flow dimensions were: deep concentration*, "During my activities I am fully focused on the activity at hand"*; merging of action and awareness, *"I do not think about my actions, the right thing just happens";* loss of self-consciousness, *"I do not think about myself when engaging in activities";* and transformation of time, *"During my activities time varies to that of reality"*. To avoid possible acquiescence, affirmation, or agreement bias responding (commonly used interchangeable terms referring to a participant's tendency to endorse items irrespective of their meaning), the initial item pool also contained negatively keyed items (DeVellis, 2003). An example of a negatively keyed item is, *"Feedback is not something I obtain"*. All dimensions for the conditions to flow and flow scales contained both negatively keyed and positively keyed items. The balance between challenge and skills dimension contained two negative and four positive items; clear goals, one negative and three positive; feedback, three negative and four positive; control, two negative and four positive; deep concentration, one negative and six positive; merging of action and awareness, two negative and one positive; loss of self-consciousness, one negative and three positive; and transformation of time, one negative and four positive.

Prior to responding to items, respondents were first asked to record up to 10 activities they had completed in the last seven days at work. This was used to prime respondents so that they were thinking about a range of activities when responding, and not just activities that stood out the most, which can occur when responding retrospectively (Massimini & Carli, 1988). To help ensure that participants did not respond to items in relation to physical activities only, the following statement was included in the preamble: "*An activity can be defined as anything that requires psychic energy/attention; it does not necessarily have to be a physical activity requiring a physical skill. For example, one such activity might be sending an email*". Respondents were asked to rate each item using a 7-point Likert type scale: 0 = *does not apply to me*; 1 = *very untrue, atypical or uncharacteristic of m*e; 2 = *fairly untrue, atypical or uncharacteristic of me*; 3 = *a bit untrue, atypical or uncharacteristic of me*; 4 = *a bit true, typical or characteristic of me*; 5 = *fairly true, typical or characteristic of me*; and 6 = *very true, typical or characteristic of m*e.

6.3.2.2 Demographic measures.

A small set of demographic questions was also asked that provided information about participants' age, gender, education, occupation, and income (see Appendix A-2 for questions).

6.3.2.3 Participants.

A convenience sample of 296 participants was recruited. The sample was made up of 90 (30.4%) males and 203 (68.6%) females; three (1.0%) participants did not indicate their gender. The mean age was 38.32 (*SD* = 12.43; 18 - 65 years). Seven participants (2.4%) indicated that they did not finish school, 6 (2.0%) indicated they had completed an apprenticeship, 49 (16.6%) indicated they had finished high school, and 229 (77.3%) indicated they had completed a degree or higher degree; 5 (1.7%) did not indicate their education level. In terms of annual income ($AUD), 96 (32.4%), 118 (39.9%), and 53 (17.9%) indicated an annual income of up to $40,000, $40,001 – $80,000, and greater than $80,001, respectively; 18 (6.1%) did not wish to divulge their annual income and 11 (3.7%) did not respond to the question. Four participants (1.4%) were categorised as Labourers, 2 (0.7%) Machinery Operators/Drivers, 13 (4.4%) Sales Workers, 70 (23.6%) Clerical and Administrative Workers, 17 (5.7%) Community and Personal Service Workers, 18 (6.1%) Technicians and Trades Workers, 113 (38.1%) Professionals, and 23 (7.8%) Managers; 36 (12.2%) did not specify their occupation.

6.3.2.4 Procedure.

This study received ethics approval from the Australian Catholic University Human Research Ethics Committee (HREC); study HREC approval register No. V200506 59 (see Appendix A-3). The questionnaire containing demographic questions and both the conditions to flow and the flow items was electronically formatted for online use. Participants were recruited from multiple sources: word of mouth, online social networking websites, e-newsletters, website advertisement, and online forums. Online social networking websites, LinkedIn and Facebook, displayed banner advertisements that asked potential participants if they could spare 30 minutes to complete an anonymous online survey for PhD research into life at work. An age filter was employed so that the advertisement only reached those who were 18 years and older. Similar worded banner advertisements appeared on the wellbeing.com.au website, e-newsletters of The Happiness Institute, and other related online forums. To participate, potential participants were provided a URL link that directed them to a website containing a participant information sheet (see Appendix A-4), followed by the online questionnaire. At the end of the questionnaire, participants submitted their responses to a secure electronic database by clicking a “submit” button. Participation was anonymous, with informed consent implied following the submission of their electronic data. Participation was voluntary and they were free to withdraw from the study at any time during the completion of the questionnaire. However, once their data were submitted, they were unable to withdraw their responses. Participants also had the opportunity to request a report of the study findings by contacting the researcher via email.

6.3.2.5 Data analysis.

Items for both the Conditions to Flow and Flow Scales were subjected to EFA. As recommended by Worthington and Whittaker (2006), the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test was used to evaluate the factorability of the data, as the cases to items ratio exceeded 5:1. A KMO value of .60 and above is considered appropriate for factor analysis (Tabachnick & Fidell, 2007). Additionally, to also determine the factorability of the data, the correlation matrix was examined for the presence of correlations .3 and above. As recommended by Widaman (1993) and Worthington and Whittaker (2006), factor analysis extraction was chosen over principal components analysis. Factor analysis is better aligned with scale development use, as it aims to examine the latent factors that explain only shared variance between items, whereas principal components analysis aims to reduce the number of items and retain original item variance. Additionally, Gorsuch (1990) also recommends factor analysis over principal components analysis, as factor analysis recognises error in variables and results in unbiased loadings. Principal axis factoring was chosen over the more commonly used maximum likelihood estimation, as it has been found that the latter can result in occasional problems when analysis involves highly iterated communalities (Gorsuch, 1997). Based on theory, it was assumed that the factors for the conditions to flow and the flow experience would be related and therefore the factors were subjected to an oblique rotation (Direct Oblimin). Delta value was set at zero for factor rotation.

Factor retention was based on multiple criteria, which included: the Kaiser rule (Kaiser as cited in Worthington & Whittaker, 2006), scree test (Cattell as cited in Pallant, 2011), parallel analysis (Horn as cited in Pallant, 2011), and conceptual interpretability, as recommended by Worthington and Whittaker (2006). For item retention, as recommended by Comrey and Lee (1992), the decision was made to retain items that had loadings greater than .55 (30% overlapping variance). Cross loading items (i.e., items that loaded above .32 on more than one factor) were retained if the difference in cross load was greater than .14 from the item's highest factor loading. Cross loading items were not deleted in the initial factor solutions for both the Condition to Flow and Flow Scales, as cross loading items may subsequently not cross load if factors are later combined or eliminated in subsequent EFA, if required. If *approximate simple structure* was not revealed in the initial EFA, problematic items were removed and an EFA was rerun using the retained items. The term approximate simple structure was used here instead of *simple structure,* as simple structure, often inappropriately used in psychological research, is present when items load highly on only one factor and have zero loadings on other factors. Approximate simple structure is where items load highly on only one factor and low on other remaining factors, which is a more realistic expectation in psychological research (McDonald, 1985).

In addition to examining the factor structure, reliability analysis was also performed on items that were retained in final factor solutions. As the sample size was large, it was randomly split into two approximately equally sized subsamples and Cronbach's alpha coefficients were calculated for each factor in both subsamples. All analyses were performed using SPSS IBM® statistics 19 software.

6.3.3 Results.

6.3.3.1 Data screening.

Prior to analysis, data were subjected to missing values analysis to assess the degree of missing data and patterns of missingness. Data were also screened for out of range values, normality, univariate and multivariate outliers, linearity, multicollinearity, and singularity.

In terms of assessing the amount of missing data, it was found that participant attrition (participants who responded to at least one item but responded to less than 60% of items) accounted for only 11.8% of the sample and missing data due to item non-response ranged from 0.0% to a high of only 1.2% for the entire set of items. To assess if patterns were present among missing data, a missing value analysis was conducted. Little's test (Little, 1988) revealed that the data were MCAR ($X^2 = 631.20$, $df = 586$, $p = .096$) and a casewise/listwise deletion for any cases that had missing values was performed (Tabachnick & Fidell, 2007). This led to a 17.9% deletion of cases and resulted in an acceptable sample size for intended analyses ($N = 243$; Comrey & Lee, 1992).

Prior to analysis, scores from negatively keyed items (items: 9, 12, 26, 27, 28, 29, 30, 31, 33, 34, 36, 38, and 42) were reversed. To assess normality, due to the likelihood of null hypothesis rejection with large samples, the shape of distributions were examined instead of formal inference tests (Tabachnick & Fidell, 2007). An inspection of frequency histograms with super imposed normal distributions, expected normal probability plots, and detrended expected normal probability plots revealed that a number of items required transformation due to moderate and substantial negative skewness. No univariate outliers (z score > 3.29; Tabachnick & Fidell, 2007) were identified. To examine evidence of linearity for both the conditions to flow and the experience of flow items, scatter plots of items considered among the worst (i.e., the most positively and negatively skewed) confirmed that the assumption of linearity was not violated.

In checking for multivariate outliers for the conditions to flow items, 13 cases were found to have Mahalanobis distance values greater than the critical value: $\chi^2(23) = 49.73$, $p < .001$ and were subsequently removed. The removal of the 13 identified outliers from the conditions to flow items dataset resulted in a sample size of 230. For the flow items, 13 cases were found ($\chi^2(19) = 43.82$, $p < .001$) and were subsequently removed, seven of which were the same cases as those removed from the conditions to flow items dataset. The removal of the 13 outliers from the flow items dataset resulted in a sample size of 230.

In checking for multicollinearity and singularity for the conditions to flow items, there was no evidence of multicollinearity (i.e., no bivariate correlations between items that were .90 or above; Tabachnick & Fidell, 2007). No squared multiple correlations (SMCs; 1 - tolerance) were found to be equal to one and therefore there was no evidence of singularity present. For the flow items, there was also no evidence of multicollinearity or singularity.

6.3.3.2 Initial EFA – Conditions to Flow Scale.

The correlation matrix of the 23 items of the Conditions to Flow Scale was subjected to a factor analysis, principal axis factoring with an oblique rotation (Direct Oblimin). The factorability of the correlation matrix was confirmed by the presence of many coefficients above .3 and a KMO value of .85.

In determining the number of factors to retain, the EFA revealed five factors with eigenvalues greater than 1 (see Table 6.1). The scree plot (see Appendix A-5) suggested that either a three (plotted eigenvalues break above a horizontal line drawn through Factor 4 and Factor 23) or five (plotted eigenvalues break above a horizontal line drawn through Factor 6 and Factor 23) factor solution should be retained. Finally, parallel analysis revealed four factors with eigenvalues greater than criterion values (95th percentile) for the same size randomly generated data matrix (230 cases x 23 variables). Conceptually it was seen as acceptable to retain four factors. Additionally, the fifth factor only contained two items that loaded above the .32 minimum cut-off criterion (Comrey & Lee, 1992). It was therefore decided to retain a four factor solution.

Table 6.1

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (N = 230)

		Pattern coefficients				Structure coefficients				
	Item	GLS	FBK	NEG	CTL	GLS	FBK	NEG	CTL	h^2
11.	When completing activities, goals are clear to me.	**.68**	-.15	.01	-.17	.77	-.32	.09	-.48	.65
19.	Before I complete activities I think or envisage what the outcomes might be like.	**.63**	-.16	.01	.01	.65	-.27	.06	-.28	.45
17.	Given my skills I believe that the activities I engage in are achievable.	**.62**	.26	.16	-.24	.68	.07	.21	-.42	.57
3.	I have clear goals before I engage in any activity.	.54	-.12	.01	-.21	.65	-.28	.07	-.47	.49
39.	I undertake activities that I have a good chance of completing.	.54	.11	.12	-.06	.55	-.02	.15	-.26	.33
40.	During my activities I try to spot or recognise any feedback that might be useful for me.	.41	-.39	-.04	.01	.47	-.45	.01	-.26	.36
14.	I believe that perfection is attainable in the activities I undertake.	.31	.05	-.10	-.25	.39	-.07	-.06	-.35	.21
9.	The activities I engage in are too easy for me. (N)	.29	**.59**	.06	.04	.17	.54	.04	.09	.37
35.	I use feedback obtained to evaluate how to accomplish my goals/activities.	.27	**-.57**	-.15	.01	.35	-.60	-.09	-.24	.45
12.	Feedback is not something I obtain. (N)	.10	**-.56**	.13	-.01	.21	-.59	.17	-.22	.38
28.	The feedback I obtain is usually not related to my activities. (N).	-.04	-.54	.47	-.10	.13	-.59	.51	-.29	.58
42.	I pay no attention to feedback presented to me. (N)	.02	-.51	.38	.10	.10	-.51	.41	-.10	.41
4.	I get/receive feedback towards goals/activities I set.	.26	-.50	-.10	-.27	.45	-.62	-.02	-.51	.57

Table 6.1 (continued)

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (N = 230)

		Pattern coefficients				Structure coefficients				
	Item	GLS	FBK	NEG	CTL	GLS	FBK	NEG	CTL	h^2
25.	I engage in activities that appropriately challenge my capabilities.	.09	-.44	-.22	-.38	.31	-.55	-.14	-.53	.50
20.	When I receive feedback it occurs immediately after an action/activity.	-.05	.35	.06	.25	-.21	.43	.01	.37	.25
33.	The activities I engage in are too difficult for me to accomplish. (N)	.18	.18	**.77**	.12	.15	.14	.76	.02	.64
36.	I worry about losing control of goal attainment when completing activities. (N)	.05	-.05	-.54	.23	-.07	.05	-.55	.25	.35
27.	When I am completing activities the goals or outcomes are not clear to me. (N)	.34	-.19	.49	.06	.39	-.27	.52	-.18	.43
22.	I feel as if I have a sense of control in activities I undertake.	.12	.02	.03	**-.81**	.43	-.24	.12	-.85	.73
6.	I'm able to perceive that I have control over the activity or situation at hand.	.15	.10	.04	**-.80**	.45	-.16	.12	-.83	.72
41.	I believe that I am able to exercise a sense of control with regard to the activities I undertake.	.15	-.05	.04	**-.73**	.45	-.29	.13	-.81	.68
30.	When completing activities, there are a number of factors that are out of my control. (N)	.20	.14	-.33	.38	.00	.24	-.37	.38	.30
1.	The activities I undertake equal my capabilities.	.26	-.27	-.12	-.37	.45	-.41	-.05	-.54	.43
EV		6.74	2.37	2.20	1.55					
% of Var.		27.26	7.97	7.34	4.55					

Note. Boldface factor loadings in the pattern matrix represent item loadings greater than .55. The eigenvalue of the fifth unretained factor was 1.29. GLS = Clear Goals; FBK = Feedback; NEG = Negative Keyed Item factor; CTL = Control; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation; (N) = negatively keyed item.

Prior to rotation, the four factors explained a total of 47.13% of the variance, with Factors 1 through 4 explaining 27.26%, 7.97%, 7.34%, and 4.55%, respectively. As factors are allowed to correlate in an oblique rotation and therefore may share overlapping variability, these proportions of variance can only be seen as rough indicators of proportions of variance after rotation (Tabachnick & Fidell, 2007).

As shown in Table 6.1, the pattern matrix revealed that for the GLS, FBK, and CTL factors, three items loaded above .55 for each factor, and one item loaded above .55 for the NEG factor. Conceptually, the NEG factor could only be interpreted as a negatively keyed item factor, as all the items loading above the .32 minimum cut-off criteria were negatively keyed items. A similar pattern was also seen in the structure coefficients matrix. From Table 6.1 it can be seen that item 14 did not load (>. 32) on any factor and the items loading on the negatively keyed item factor (>. 32) were problematic, likely due to being negatively keyed. These items were subsequently removed and an EFA was rerun in an attempt to obtain approximate simple structure (McDonald, 1985).

6.3.3.3 Revised EFA – Conditions to Flow Scale.

Rerunning an EFA with the problematic items removed (items 14, 27, 28, 30, 33, 36, and 42) revealed two complex items (items 17 and 39) that were subsequently removed and resulted in the remaining 14 conditions to flow items being subjected to EFA. Complex items are those that cross load above .32 on more than one factor and where the difference between the factor loadings is equal to or less than .14 from the item's highest factor loading. The factorability of the correlation matrix was confirmed (presence of coefficients above .3 and a KMO value of .84).

In determining the number of factors to retain, the EFA revealed four factors with eigenvalues greater than 1 (see Table 6.2), the scree plot (see Appendix A-6) suggested the retention of four factors, and parallel analysis suggested two factors. Conceptually it was seen as acceptable to retain four factors; the fourth factor had three items loading above .55 and represented a known dimension to flow. It was therefore decided by the present researcher to specify a four factor solution.

Table 6.2

Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (N = 230)

	Item	Pattern coefficients				Structure coefficients				h^2
		CTL	CHL	GLS	FBK	CTL	CHL	GLS	FBK	
22.	I feel as if I have a sense of control in activities I undertake.	**.86**	-.03	-.01	.04	.88	-.23	.49	.38	.77
6.	I'm able to perceive that I have control over the activity or situation at hand.	**.86**	.01	.03	-.03	.87	-.17	.49	.32	.75
41.	I believe that I am able to exercise a sense of control with regard to the activities I undertake.	**.78**	.03	-.01	.17	.84	-.21	.49	.46	.72
25.	I engage in activities that appropriately challenge my capabilities.	.21	**-.82**	.18	-.06	.46	-.88	.45	.45	.87
9.	The activities I engage in are too easy for me. (N)	.15	**.55**	.10	-.15	.02	.56	-.02	-.28	.35
1.	The activities I undertake equal my capabilities.	.25	**-.44**	.31	-.02	.50	-.55	.53	.40	.52
3.	I have clear goals before I engage in any activity.	.02	-.06	**.83**	-.07	.46	-.23	.82	.35	.68
11.	When completing activities, goals are clear to me.	.08	.03	**.76**	.08	.52	-.20	.83	.45	.71
19.	Before I complete activities I think or envisage what the outcomes might be like.	-.07	.02	**.61**	.15	.32	-.17	.64	.40	.43
35.	I use feedback obtained to evaluate how to accomplish my goals/activities.	-.04	-.01	.06	**.68**	.26	-.30	.35	.70	.49
40.	During my activities I try to spot or recognise any feedback that might be useful for me.	.03	.10	.14	**.56**	.31	-.18	.39	.60	.38
12.	Feedback is not something I obtain. (N)	.00	-.10	-.04	**.55**	.21	-.32	.24	.58	.34
4.	I get/receive feedback towards goals/activities I set.	.14	-.15	.17	.51	.46	-.43	.52	.71	.58
20.	When I receive feedback it occurs immediately after an action/activity.	-.15	.04	.04	-.44	-.31	.25	-.26	-.50	.27
EV		5.58	1.60	1.19	1.13					
% of Var.		37.19	8.34	5.69	4.88					

Note. Boldface factor loadings in the pattern matrix represent the retained items. The eigenvalue of the fifth unretained factor was 0.84. CTL = Control; CHL = Appropriate Challenge; GLS = Clear Goals; FBK = Feedback; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation; (N) = negatively keyed item.

Prior to rotation, the four factors explained a total of 56.09% of the variance, with Factors 1 through 4 explaining 37.19%, 8.34%, 5.69%, and 4.88%, respectively. As shown in Table 6.2, the pattern matrix revealed that for the CTL, GLS, and FBK factors, three items loaded above .55 for each factor and two items loaded above .55 for the CHL factor. However, as this was an interpretable factor and a scale can contain a minimum of three items (DeVellis, 2003), and given the high cut-off criterion, it was decided to also retain the third highest item loading for the CHL factor (item 1). This loading for item 1 (-.44) was still well above the minimum .32 cut-off criteria for retaining items. The structure matrix revealed a similar pattern to the pattern matrix. As can be seen in Table 6.2, the revised EFA approximates simple structure (McDonald, 1985). The correlations between factors were next inspected to assess whether an oblique rotation was warranted.

Table 6.3

Conditions to Flow, Revised Four Factor Correlation Matrix (N = 230)

Factor	1	2	3	4
1. CTL	-	-.21	.55	.39
2. CHL	-.21	-	-.23	-.42
3. GLS	.55	-.23	-	.46
4. FBK	.39	-.42	.46	-

Note. CTL = Control; CHL = Appropriate Challenge; GLS = Clear Goals; FBK = Feedback.

Table 6.3 shows that factors were found to correlate above .32, warranting the use of an oblique rotation.

6.3.3.4 Cronbach's alpha coefficients for the revised EFA – conditions to flow.

To determine Cronbach's alpha coefficients, the sample was randomly split into two equally sized subsamples and coefficients were computed for each subsample.

Table 6.4

Cronbach's alpha Coefficients for the Four Factors

Subsample	CTL	CHL	GLS	FBK
1	.89	.45	.82	.54
2	.91	.40	.80	.69

Note. CTL = Control; CHL = Appropriate Challenge; GLS = Clear Goals; FBK = Feedback.

As shown in Table 6.4, only the CTL and GLS factors had Cronbach's alpha coefficients greater than the recommended minimum .60 cut-off criteria in both subsamples (DeVellis, 2003).

6.3.3.5 Initial EFA – Flow Scale.

The correlation matrix of the 19 items of flow was subjected to a factor analysis, principal axis factoring with an oblique rotation (Direct Oblimin). The factorability of the correlation matrix was confirmed (presence of correlation coefficients above .3 and a KMO value of .92).

In determining the number of factors to retain, the EFA revealed four factors with eigenvalues greater than 1 (see Table 6.5), the scree plot (see Appendix A-7) suggested that either a two (plotted eigenvalues break above a horizontal line drawn through Factor 3 and Factor 19) or a four (plotted eigenvalues break above a horizontal line drawn through Factor 5 and Factor 19) factor solution should be retained, and parallel analysis suggested the retention of two factors. Conceptually it was seen as acceptable to retain four factors; the fifth factor only had two items that loaded above .32. It was therefore decided by the present researcher to specify a four factor solution.

Table 6.5

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Flow Items (N = 230)

		Pattern coefficients				Structure coefficients				
	Item	CON	NEG	UNI	TOT	CON	NEG	UNI	TOT	h^2
10.	The activities I undertake require my full concentration.	**.88**	.10	.10	.01	.83	.12	-.38	.35	.70
21.	My activities require me to concentrate all my attention to the task at hand.	**.87**	.09	-.02	-.05	.86	.10	-.48	.34	.75
18.	My attention is completely absorbed when I am completing activities.	**.60**	.08	-.26	.14	.80	.09	-.64	.50	.72
2.	During my activities I am fully focused on the activity at hand.	.53	.26	-.20	.20	.72	.27	-.56	.53	.67
23.	I feel so involved in my activities that I forget about myself.	-.48	.12	.37	-.12	-.73	.12	.69	-.46	.67
29.	When I engage in activities, I don't feel focused on the task at hand. (N)	.18	**.56**	-.49	.16	.53	.55	-.64	.49	.80
26.	When I am completing activities I am easily distracted. (N)	-.14	-.38	.35	-.16	-.40	-.39	.48	-.40	.43
37.	I do not think about my actions, the right thing just happens.	.07	.24	.04	-.03	.04	.24	.02	.01	.06
7.	I do not think about myself when engaging in activities.	.30	-.23	**-.59**	-.06	.60	-.26	-.74	.29	.65
31.	I am conscious of myself during activities I complete. (N)	.04	.02	**.57**	.10	-.23	.05	.51	-.12	.27
34.	During my activities I have doubts and question why am I doing them. (N)	.07	-.25	.53	-.19	-.31	-.25	.56	-.40	.42
13.	When involved in my activities, I forget about the unpleasant aspects of life.	-.19	.22	.53	-.22	-.57	.22	.73	-.50	.65
5.	I am involved in activities that allow me to forget about my worries and frustrations about everyday life.	-.20	.12	.52	-.12	-.54	.13	.68	-.41	.53
15.	I feel a sense of union with my environment when engaging in activities.	-.25	.02	.25	-.22	-.47	.01	.47	-.42	.33
24.	During my activities time varies to that of reality.	-.14	.27	.04	**-.63**	-.43	.22	.39	-.69	.57
32.	After completing activities I am amazed at how fast time has passed.	.30	-.10	-.06	**.58**	.58	-.05	-.47	.72	.62

Table 6.5 (continued)

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Flow Items (N = 230)

	Item	Pattern coefficients				Structure coefficients				h^2
		CON	NEG	UNI	TOT	CON	NEG	UNI	TOT	
16.	Time appears to be going much faster than normal in my activities.	.32	-.17	-.13	**.57**	.63	-.12	-.55	.74	.71
8.	I lose track of time during activities.	-.22	.27	.17	-.47	-.51	.24	.50	-.61	.55
38.	During my activities I never notice that time varies from reality. (N)	.08	-.12	-.04	-.30	-.03	-.15	.04	-.26	.09
EV		8.18	1.47	1.22	1.15					
% of Var.		41.11	5.43	3.65	3.39					

Note. Boldface factor loadings in the pattern matrix represent item loadings greater than .55. The eigenvalue of the fifth unretained factor was 0.95. CON = Deep Concentration; NEG = Negatively Keyed Item factor; UNI = Uninterpretable factor; TOT = Transformation of Time; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation; (N) = negatively keyed item.

Prior to rotation, the four factors explained a total of 53.58% of the variance, with Factors 1 through 4 explaining 41.11%, 5.43%, 3.65%, and 3.39%, respectively. As shown in Table 6.5, the pattern matrix revealed that for the CON and TOT factors, three items loaded above .55 for each factor and for the NEG factor, one item loaded above .55 and another item loaded above the minimum .32 cut-off criteria. The NEG factor was interpreted as a negatively keyed item factor, as the two items that loaded above .32 were both negatively keyed. The UNI factor contained two items loading above .55 that were intended to resemble the loss of self-consciousness dimension of flow. Additionally, a third item loading above .32 on this UNI factor also represented this same dimension. There were also three items that were intended to load onto the deep concentration dimension and two items that were intended to load onto the merging of action and awareness dimension that loaded above .32 on this same UNI factor. As multiple items from different dimensions loaded onto this UNI factor, no meaningful interpretation was possible for this factor. A similar pattern can also be seen in the structure coefficients matrix. The structure matrix only showed good discrimination between the CON factor and the other three factors and also the TOT and the other three factors: the loadings for the CON factor showed that the lowest loading item retained for that factor (.80) was higher than the loadings of retained items from other factors. Likewise for the TOT factor, the lowest loading item retained for that factor (-.69) was higher than the loadings of retained items from other factors.

From Table 6.5 it can seen that there were three items that did not load above the minimum .32 cut-off criteria on the four factors, additionally two of these items had substantially low communality coefficient estimates (e.g., < .10), suggesting that these items had only a very small amount of variance that could be explained by the four factors. The two items that loaded above .32 on the NEG factor were also problematic, likely due to being negatively keyed. These items (i.e., both the low loading and negatively keyed) were subsequently removed and an EFA was rerun in an attempt to obtain approximate simple structure (McDonald, 1985).

6.3.3.6 Revised EFA – Flow Scale.

Rerunning an EFA with the problematic items removed (items 15, 26, 29, 37, and 38) revealed a complex item (item 23), which was removed and resulted in the remaining 13 flow items being subjected to EFA. The factorability of the correlation matrix was confirmed (presence of correlation coefficients above 3 and a KMO value of .91).

In determining the number of factors to retain, the EFA revealed three factors with eigenvalues greater than 1 (see Table 6.6), the scree plot (see Appendix A-8) suggested a three factor solution, and parallel analysis suggested the retention of one factor. Conceptually it was seen as acceptable to retain three factors; the third factor was an interpretable factor and had five items that loaded above .32. It was therefore decided by the present researcher to specify a three factor solution.

Table 6.6

Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Three Factor Solution of the Flow Items (N = 230)

		Pattern coefficients			Structure coefficients			
	Item	TOT	CON	ORD	TOT	CON	ORD	h^2
16.	Time appears to be going much faster than normal in my activities.	**.80**	.10	.00	.86	.61	-.50	.75
24.	During my activities time varies to that of reality.	**-.76**	.07	-.01	-.71	-.41	.38	.50
32.	After completing activities I am amazed at how fast time has passed.	**.72**	.15	.04	.79	.59	-.45	.64
8.	I lose track of time during activities.	**-.67**	.01	.12	-.74	-.49	.50	.55
10.	The activities I undertake require my full concentration.	-.01	**.89**	.10	.51	.83	-.38	.69
21.	My activities require me to concentrate all my attention to the task at hand.	-.08	**.88**	-.05	.51	.86	-.48	.74
18.	My attention is completely absorbed when I am completing activities.	.14	**.62**	-.21	.65	.82	-.62	.73
2.	During my activities I am fully focused on the activity at hand.	.14	**.62**	-.11	.59	.76	-.52	.61
31.	I am conscious of myself during activities I complete. (N)	.09	.03	**.60**	-.23	-.24	.53	.29
7.	I do not think about myself when engaging in activities.	.13	.16	**-.56**	.55	.54	-.72	.56
5.	I am involved in activities that allow me to forget about my worries and frustrations about everyday life.	-.21	-.09	**.54**	-.57	-.52	.71	.55
13.	When involved in my activities, I forget about the unpleasant aspects of life.	-.35	-.03	.54	-.23	-.24	.53	.65
34.	During my activities I have doubts and question why am I doing them. (N)	-.10	-.12	.37	-.38	-.38	.49	.26
EV		6.51	1.16	1.12				
% of Var.		47.18	6.02	4.64				

Note. Boldface factor loadings in the pattern matrix represent the items retained. The eigenvalue of the fourth unretained factor was 0.78. TOT = Transformation of Time; CON = Deep Concentration; ORD = Order in Consciousness; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation; (N) = negatively keyed item.

Prior to rotation, the three factors explained a total of 57.84% of the variance, with Factors 1 through 3 explaining 47.18%, 6.02%, and 4.64%, respectively. As shown in Table 6.6, the pattern matrix revealed that for the TOT and CON factors, four items loaded above .55 for each factor and two items loaded above .55 for the ORD factor. However, it was decided to also retain the third highest item loading for this ORD factor (item 5), given the high cut-off criteria. This loading (.54) was still well above the minimum .32 cut-off criteria for retaining items. A similar pattern can also be seen in the structure coefficients matrix. The structure matrix revealed good discrimination between the TOT factor and the other two factors, as well as the CON and the other two factors: the loadings for the TOT factor showed that the lowest loading item retained for that factor (-.71) was higher than the loadings of retained items from other factors. Likewise for the CON factor, the lowest loading item retained for that factor (.76) was higher than the loadings of retained items from other factors. As can be seen in Table 6.6, the revised EFA approximates simple structure (McDonald, 1985). The correlations between factors were next inspected to assess whether an oblique rotation was warranted.

Table 6.7

Flow, Revised Three Factor Correlation Matrix (N = 230)

Factor	1	2	3
1. TOT	-	.64	-.57
2. CON	.64	-	-.54
3. ORD	-.57	-.54	-

Note. TOT = Transformation of Time; CON = Deep Concentration; ORD = Order in Consciousness.

Correlations above .32 in Table 6.7 provide support for the decision to use an oblique rotation for this correlation matrix.

6.3.3.7 Cronbach’s alpha coefficients for the revised EFA – flow.

Next Cronbach's alpha coefficients were computed for each randomly split subsample.

Table 6.8

Cronbach's alpha Coefficients for the Three Flow Factors

Subsample	TOT	CON	ORD
1	.69	.89	.52
2	.70	.88	.52

Note. TOT = Transformation of Time; CON = Deep Concentration; ORD = Order in Consciousness.

As shown in Table 6.8, only the TOT and CON factors had Cronbach's alpha coefficients greater than the recommended minimum .60 cut-off criteria (DeVellis, 2003).

6.3.4 Study 1 discussion.

The aim of the present study was to develop two scales for the workplace; one that measures the conditions to flow and the other that measures the flow experience. For the Conditions to Flow Scale, it was expected that, factor analysis would reveal the following four interpretable factors: appropriate challenge, clear goals, feedback, and control. These four factors were proposed to represent the conditions to flow. For the Flow Scale, it was expected that factor analysis would reveal the following four interpretable factors: transformation of time, deep concentration, loss of self-consciousness, and merging of action and awareness. These four factors were proposed to represent dimensions of the flow experience.

As expected, for the Conditions to Flow Scale, a four factor solution was found, with each factor representing one of the four proposed conditions to flow. Three items were found to load on each of the four factors and all item loadings, except for one (item 1), loaded above .55, which is seen as good according to Comrey and Lee (1992). The item not found to load above .55 (item 1) was still well above the minimum .32 cut-off criterion (-.44). Although there is evidence of factorial validity for the Conditions to Flow Scale, Cronbach's alpha coefficients for the Appropriate Challenge and Feedback factors (subsample one only) were found to be below the accepted minimum .60 cut-off criterion (DeVellis, 2003), indicating that items may not necessarily be internally consistent.

A possible explanation for the low internal consistency found in the Appropriate Challenge and Feedback factors may be due to the use of negatively keyed items. DeVellis (2003) states that, having both positively and negatively keyed items in the same scale can be confusing for participants, and other researchers have found that negatively keyed items lowered the internal consistency of scales (Barnette, 2000; Schriesheim & Eisenbach, 1995). The Appropriate Challenge and Feedback factors were the only two factors that contained negatively keyed items and had unacceptably low internal consistency.

Another possible explanation for the low internal consistency for the Appropriate Challenge dimension is that the items may not clearly capture the appropriate balance between challenge and skill. It was noticed that the negatively keyed item, "*The activities I engage in are too easy for me*", could also be endorsed (i.e., "*very much atypical or uncharacteristic of me*") by someone who was over-challenged (i.e., someone who was not in flow). For this item, responding by someone who was appropriately challenged would be indistinguishable from someone whose skills were over-utilised (i.e., someone who was not in flow). Additionally, the item, "*The activities I undertake equal my capabilities*", may not necessarily be capturing the appropriate stretching of skills that helps to facilitate the flow experience. It is, therefore, suggested that these items be further revised to better reflect the appropriate stretching of a person's skills.

For the Flow Scale, a three factor solution was found with two factors representing two of the known dimensions to flow: Transformation of Time and Deep Concentration. The third factor was interpreted as a possible Order in Consciousness factor, as the three items retained (item 31, "*I am conscious of myself during activities I complete*" – negatively keyed; item 7, "*I do not think about myself when engaging in activities*"; and item 5, "*I am involved in activities that allow me to forget about my worries and frustrations about everyday life*") all relate to the experience where one's mind is in order – he/she is unable to think about themselves nor think about their everyday worries and frustrations. Providing further support for the interpretation of this factor is that item 13, "*When involved in my activities, I forget about the unpleasant aspects of life*", although not retained, was the next lowest loading item (.54) on this factor and also relates to an order in consciousness.

Csikszentmihalyi (2002) mentions the possibility of experiencing order in consciousness, described as a complete focusing of attention, so much so, that there is no available psychic energy left to process non-task related information. Although not seen as a separate dimension of flow, order in consciousness is referred to within the deep concentration dimension. However, it may be that the deep concentration dimension contains two possible dimensions of flow: one of deep concentration and the other of order in consciousness. The results from this study offer some support for this possibility: In the final EFA solution, out of the retained six items developed for the deep concentration dimension: item 2, "*During my activities I am fully focused on the activity at hand*"; item 10, "*The activities I undertake require my full concentration*"; item 18, "*My attention is completely absorbed when I am completing activities*"; and item 21, "*My activities require me to concentrate all my attention to the task at hand*", loaded onto a separate factor interpreted as Deep Concentration, while item 5, "*I am involved in activities that allow me to forget about my worries and frustrations about everyday life*" and item 13, "*When involved in my activities, I forget about the unpleasant aspects of life*", loaded onto the Order in Consciousness factor. As was found in the present study, it may also be possible that the items resembling the loss of self-consciousness dimension (i.e., items 7 and 31) may load on the same Order in Consciousness factor, as forgetting about the concept of one's self may add to order in consciousness. This is because forgetting about one's self resembles attention being directed away from task-irrelevant stimuli (i.e., preoccupation with the 'self') and increased attention being directed towards the task at hand (i.e., order in consciousness). However, the flow model describes the loss of self-consciousness as a separate dimension of flow (Csikszentmihalyi, 2002). Although there is some evidence of factorial validity for the Flow Scale, Cronbach's alpha coefficients for the Order in Consciousness factor remain below the accepted minimum .60 cut-off criterion (DeVellis, 2003), indicating that items may not necessarily be internally consistent. Similar to the Appropriate Challenge and Feedback factor, the Order in Consciousness factor had a negatively keyed item in the final factor solution, which, as previously mentioned, may negatively affect the internal consistency of a scale.

A possible reason as to why EFA did not reveal a Merging of Action Awareness factor may be due to items not clearly reflecting the experience where one is unaware that they are performing the activity (i.e., automatic and effortless movement). For example, the negatively keyed item, "*When I am completing activities I am easily distracted*", when endorsed (i.e., "*very much atypical or uncharacteristic of me*"), likely better reflects the extent to which one is able to concentrate on the task at hand. Similarly, the negatively keyed item, "*During my activities I have doubts and question why am I doing them"*, when endorsed (i.e., "*very much atypical or uncharacteristic of me*"), likely better reflects the Order in Consciousness factor, as it reflects an inability to process non-task related information. It is, therefore, suggested that these items be further revised to specifically reflect the experience where one is unaware that they are performing the activity.

In the developed scales, it appears that the inclusion of negatively keyed items may be problematic for the internal consistency of the scales. The recommendation to use negatively keyed items is based on the assumptions that: (a) response biases pose a severe threat to the scales validity, (b) negatively keyed items do not negatively affect the psychometric properties of the scale, and (c) the underlying meaning of an item is not changed when reworded into a negatively keyed format (Schriesheim & Eisenbach, 1995). However, research has found issues with the validity of all three assumptions (Schriesheim & Eisenbach, 1995). Firstly, Nunnally (1978) states that there is substantial evidence showing that response biases pose little threat to the validity of scales. Secondly, as previously mentioned, researchers have found that negatively keyed items lowered the internal consistency of scales (Barnette, 2000; Schriesheim & Eisenbach, 1995) and factor analysis often results in negatively keyed factors (Schmitt & Stuits, 1985). For example, Schmitt and Stuits (1985) identified in three separate data sets that when only 10% of the sample was responding carelessly (i.e., not correctly reading the direction of the items), this resulted in a negative factor. This finding is consistent with the results from the present research. For both the Conditions to Flow Scale and Flow Scale, a Negative Keyed Item factor was found. Thirdly, research has shown that participants find some truth to both positively and negatively keyed items, despite their opposing underlying meaning (Weijters, Geuens, & Schillewaert, 2009). Barnette (2000) states that the inclusion of negatively keyed items to prevent against acquiescent, affirmation, or agreement bias style responding is likely unnecessary in most research where participation is voluntary and where reasoned responses can be provided.

Given the results of the current study, it is suggested that a number of revisions be made to the Conditions to Flow scale and Flow Scale to improve the internal consistency and to better capture all the intended dimensions of the conditions to flow and of the flow experience itself. These suggested revisions are discussed below.

(a) Given the findings from the current study and the supporting literature suggesting that the inclusion of negatively keyed items are problematic and likely unwarranted, it suggested that in future scale revisions, all negatively keyed items be removed and replaced with positively keyed items.

(b) For the Appropriate Challenge dimension, as mentioned previously, it is suggested that items be revised to better capture the stretching of one's skills, rather just the degree of balance between challenge and skill, and to ensure that items cannot be endorsed by someone who is under-challenged (i.e., someone who was not in flow).

(c) For the Merging of Action and Awareness dimension, as mentioned previously, it is suggested that items be revised to specifically capture the experience where one is unaware that they are performing the activity (i.e., automatic and effortless movement).

(d) As the intended scales aimed to measure the flow experience at work, it is suggested that, the word "activities" in the items be replaced with the word "work". This suggestion is made because it is likely that responding to items in reference to activities involves an unnecessary three step processing of information, whereby participants are required to firstly, think about their activities at work; secondly, decide how to respond for each activity; and then thirdly, generate a single response that best represents their activities overall. It is, therefore, considered more appropriate to simply ask participants to respond to items based on their experience of work.

(e) For items that aimed to capture the feedback dimension, it is believed that the word "feedback" may prompt respondents to only report feedback received from managers, supervisors, or colleagues. It is, therefore, suggested that items be revised to better reflect all possible forms of feedback, including those that can be derived from the task itself.

(f) It is suggested that items be changed from present tense to past tense, as participants respond retrospectively to items.

(g) To help ensure that state like experiences were captured in responses, rather than trait like experiences, it is suggested that in the preamble, participants be instructed to respond to items in relation to the previous two weeks, rather than how they generally behave and feel.

(h) The responding format of the current scales measure the extent to which the conditions to flow and the dimensions of the flow experience are present in the workplace. However, given that the flow experience doesn't vary in its level of intensity (i.e., one is either experiencing flow or not), it may be more useful to measure the frequency of flow experiences, rather than the degree to which one experiences flow. Therefore, it is suggested that the responding format be changed to reflect the frequency of the specific dimensions experienced.

(i) It is possible for participants to not be familiar with some of the flow experiences and, therefore, it is suggested that in the preamble, participants be instructed to take their time to understand each statement as best they can, prior to responding.

(j) As negatively phrased items (i.e., items that contain "do not" – not negatively keyed) can be confusing for some participants, it is suggested that in the preamble, participants be informed of their presence in the scale and instructed to respond accordingly.

6.4 Study 2: Revised Development of the Conditions to Flow and Flow Scales

The results from the previous study revealed that both the Conditions to Flow and Flow Scales were psychometrically inadequate and unlikely to capture all the dimensions of the conditions to flow, and of the flow experience. Drawing upon these findings and based on the psychometric literature reviewed in this chapter, a number of revisions were made to improve the psychometric properties of the developed scales and to more fully capture both the conditions to flow and the flow experience.

6.4.1 Introduction.

Based on the dimensions identified in flow theory, the developed scales in Study 1 revealed internally consistent factors for the control, clear goals, transformation of time, and deep concentration dimensions, and did not reveal either factors or internally consistent factors for the other dimensions identified in flow theory: appropriate challenge, feedback, merging of action and awareness, and loss of self-consciousness. It was suggested that negatively keyed items were largely responsible for EFAs not revealing internally consistent factors for all the dimensions.

Given the findings from the previous study and the supporting literature suggesting that the inclusion of negatively keyed items were problematic and likely unwarranted, it was decided to remove all negatively keyed items and replace them with positively keyed items. It is believed that this will improve the internal consistency of the factors extracted and prevent the emergence of negatively keyed item factors. Additionally, as mentioned in the discussion of the previous study, a number of suggested scale revisions will also be made to better capture all the dimensions of the conditions to flow and of the flow experience, and to make it easier for participants to respond to items. These revisions are detailed below in section 6.4.2.1

6.4.2 Method.

6.4.2.1 Revised scale development.

The revisions made to both scales (see Appendix A-9 for scales) are listed below:

(a) The word “activities” in the items was replaced with the word “work”. For example, the previously worded item, “*The activities I undertake require my full concentration*” was revised to, “*My work required my full concentration*”. In the revised version of these scales, participants were not asked to list their activities completed at work as it was considered unnecessary once having removed the reference to activities from items.

(b) For the appropriate challenge dimension, items were revised to better reflect the stretching of one's skills. An example of a revised items is, "*My work neither underutilised nor exceeded my skill level"*.

(c) For the feedback dimension, items were reworded to better reflect all possible forms of feedback that could be obtained. An example of a revised item for this dimension is, "*At work I clearly knew if I was performing well*".

(d) For the merging of action and awareness dimension, items were revised to better reflect the experience where one is unaware that they are performing the activity (i.e., automatic and effortless movement). An example of a revised item is, "*I was so involved in my work that it felt effortless*".

(e) As previously mentioned, all negatively keyed items were reworded into a positively keyed format. For example, "*When I am completing activities the goals or outcomes are not clear to me*", was reworded to, "*At work I clearly understood what I needed to do*".

(f) The response format was changed to reflect the frequency of the specific dimensions experienced, rather than the extent to which they were experienced. This was achieved by changing the original 7-point Likert type scale: 0 = *does not apply to me*; 1 = *very untrue, atypical or uncharacteristic of me*; 2 = *fairly untrue atypical or uncharacteristic of me*; 3 = *a bit untrue atypical or uncharacteristic of me*; 4 = *a bit true typical or characteristic of me*; 5 = *fairly true typical or characteristic of me*; and 6 = *very true, typical or characteristic of me,* to a 6-point Likert type scale; 0 = *never*, 1 = *almost never*, 2 = *seldom*, 3 = *sometimes*, 4 = *usually*, and 5 = *almost alway*s.

(g) Items were changed from present tense to past tense, as participants respond retrospectively to items.

(h) In the preamble, participants were specifically asked to respond to items in relation to the previous two weeks, rather than how they generally behave and feel. This was done to help ensure that state like experiences were captured in responses, rather than trait like experiences.

(i) As participants may not necessarily be familiar with some flow experiences, they were informed to take their time to understand each statement as best they could, prior to responding.

(j) As some items were negatively phrased (i.e., contain "do not"– not negatively keyed; e.g., "*During my work I did not question/doubt what I was doing"*), participants were informed that such items exist and were instructed to respond accordingly (see Appendix A-9 for instruction).

6.4.2.2 Demographic measures.

A small set of demographic questions was asked that provided information about participants' age, gender, education, occupation, average weekly hours of employment, job tenure, and income (see Appendix A-10 for questions).

6.4.2.3 Participants.

A convenience sample of 333 participants was recruited. The sample was made up of 78 (23.4%) males and 251 (75.4%) females; four (1.2%) participants did not indicate their gender. The mean age was 40.41 (*SD* = 11.29; 18 - 74 years). Two participants (0.6%) indicated that they did not finish school, 4 (1.2%) indicated they had completed an apprenticeship, 39 (11.7%) indicated they had finished high school, and 284 (85.3%) indicated they had completed a degree or higher degree; 4 (1.2%) did not specify their level of education. Responding to the annual income ($AUD) question showed that 57 (17.1%), 155 (46.5%), and 89 (26.7%) participants indicated an annual income of up to $40,000, $40,001 – $80,000, and greater than $80,001, respectively; 26 (7.8%) did not wish to divulge their annual income and 6 (1.8%) did not respond to the question. In terms of occupation, 3 (0.9%) were categorised as Labourers, 14 (4.2%) Sales Workers, 58 (17.4%) Clerical and Administrative Workers, 38 (11.4%) Community and Personal Service Workers, 8 (2.4%) Technicians and Trades Workers, 151 (45.3%) Professionals, and 40 (12.0%) Managers; 21 (6.3%) did not indicate their occupation. The mean number of hours worked per week was 38.17 (*SD* = 10.82; with a range of 5 - 90 hours) and the mean job tenure was 5.40 years (*SD* = 6.02; with a range of 1.2 months - 44 years).

6.4.2.4 Procedure.

Ethics approval from the previous study was used following an amendment to extend the duration of the approval and to administer the revised items (Australian Catholic University HREC approval register No. V200506 59; see Appendix A-11 for the amendment approval letter). This study followed the same procedures as detailed in Study 1 (see section 6.3.2.4, page 79)

6.4.2.5 Data analysis.

This study utilised the same data analytic strategy as detailed in Study 1 (see section 6.3.2.5, page 80).

6.4.3 Results.

6.4.3.1 Data screening.

Prior to analysis, data were screened as detailed in Study 1, (see section 6.3.3.1, page 81). Participant attrition accounted for only 0.3% of the sample and missing data due to item non-response ranged from 0.0% to a high of only 3.0% for the entire set of items. Using SPSS missing value analysis, Little's test (Little, 1988) revealed that the data were not MCAR (χ^2 = 5261.11, *df* = 4384, $p < .001$). Multiple imputation (MI) methods are considered appropriate for data that is not MCAR (Schafer & Graham, 2002; Schlomer, Bauman, & Card, 2010) as the imputation technique does not assume that the data are randomly missing (Tabachnick & Fidell, 2007) and, therefore, MI was performed to impute missing values.

Prior to MI, data were screened for normality and it was revealed that some items required transformation due to moderate negative skewness. Additionally, as outliers can excessively influence the imputation of missing values (Quintano, Castellano, & Rocca, 2010), prior to MI, potential univariate outliers, seen as a legitimate part of the population in this study, were retained and adjusted using the formula $x = (3 \times SD) \pm \bar{x}$ (Field, 2005).

MI was performed as described in SPSS Inc. (2007).To ensure that no out of range values were imputed, the imputation of values was constrained to the possible scoring response range of the items in the developed scales (i.e., zero to five). In checking for multivariate outliers for the conditions to flow items, 13 cases were found to have Mahalanobis distance values greater than the critical value: $\chi^2(26) = 54.05$, $p < .001$ and were subsequently removed. For the flow items, 22 cases were found ($\chi^2(28) = 56.89$, $p < .001$) and were subsequently removed. As MI generates five imputed data sets by default, only cases that were found to be multivariate outliers in all five data sets were removed. The removal of 13 outliers from the condition to flow items dataset and 22 outliers from the flow items dataset resulted in a sample size of 320 and 311, respectively.

Linearity was confirmed by methods as detailed in Study 1 (see page 82). For the conditions to flow items, there was no evidence of multicollinearity (i.e., no bivariate correlations between items that were .90 or above; Tabachnick & Fidell, 2007) and no evidence of singularity. For the flow items, the presence of multicollinearity was found between items 53 and 54 and, therefore, item 53 was removed as this was the item in the model with the highest proportion of variance explained by the root (dimension) with a condition index above 30. There was no evidence of singularity for the flow items. As analyses produced negligible differences among the five imputed data sets, only the results from the first imputed data set were presented.

6.4.3.2 Initial EFA – revised Conditions to Flow Scale.

The correlation matrix of the 26 items of the revised Conditions to Flow Scale was subjected to an EFA, principal axis factoring with an oblique rotation (Direct Oblimin). The factorability of the correlation matrix was confirmed (based on the presence of correlation coefficients larger than .3 and a KMO value of .95).

In determining the number of factors to retain, the EFA revealed five factors with eigenvalues greater than 1 (see Table 6.9), the scree plot (see Appendix A-12) and parallel analysis both suggested a three factor solution. Conceptually, it was seen as acceptable to retain four factors, the fifth factor contained only two items that loaded just above the minimum .32 cut-off criteria, they were not highly correlated with each other (i.e., .70), and were correlated with other items making the fifth factor hazardous and unreliable (Tabachnick & Fidell, 2007). It was therefore decided to specify a four factor solution.

Table 6.9

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (N = 320)

		Pattern coefficients				Structure coefficients				
	Item	FBK	CHL	CTL	GLS	FBK	CHL	CTL	GLS	h^2
43.	At work I constantly knew if I was performing well.	**.94**	.03	.00	-.01	.95	.34	.62	.57	.90
36.	At work I clearly knew if I was performing well.	**.88**	.01	.06	.04	.94	.33	.66	.60	.89
28.	At work I immediately knew if I was performing well.	**-.85**	-.05	.04	-.06	-.88	-.35	-.57	-.57	.78
12.	At work it was clear to me how well I was performing.	**.82**	.03	.04	.03	.88	.32	.60	.56	.77
20.	At work I was regularly aware of how well I was performing.	**.82**	.04	.02	.08	.90	.35	.62	.60	.82
4.	At work I could tell if I was succeeding in my goals.	.39	.04	.24	.24	.70	.33	.64	.62	.59
33.	My work appropriately challenged my skill level.	-.01	**.89**	.05	.06	.35	.92	.31	.43	.85
17.	My work appropriately challenged me.	-.06	**.88**	.10	.07	.34	.92	.34	.44	.86
47.	At work I felt appropriately challenged.	.00	**.84**	.11	.04	.38	.89	.36	.44	.81
1.	My work appropriately challenged my capabilities.	-.04	**.82**	-.01	.11	.29	.85	.25	.41	.73
40.	My work neither underutilised nor exceeded my skill level.	.09	.30	.24	.06	.38	.42	.41	.37	.28
25.	Given my skills, my work was just manageable.	-.05	-.27	.05	.05	-.08	-.25	-.03	-.06	.07
3.	I felt that I was in control of my work.	-.06	-.08	**.84**	.08	.51	.16	.82	.49	.69
35.	I felt that I had total control of my work.	.09	.05	**.82**	.00	.64	.29	.88	.53	.79
11.	I believed that it was possible to have control of my own work.	.03	.09	**.77**	.00	.56	.31	.81	.49	.67
19.	At work I believed that I was able to exercise a sense of control over what I was doing.	.05	.17	**.73**	.08	.63	.42	.86	.59	.78
42.	At work I experienced a sense of control over what I was doing.	.16	.05	**.71**	.07	.68	.32	.87	.59	.78
9.	My work was neither easy nor too difficult for me.	-.03	.12	.44	.08	.35	.27	.50	.37	.28
27.	I did not worry about losing control of my work.	.15	-.07	.39	-.08	.33	.06	.43	.20	.20
48.	At work I did not have any conflicting demands (goals).	.04	.02	-.37	.00	-.20	-.07	-.40	-.18	.12
2.	I had clear goals before I engaged in my work.	-.04	.07	-.07	**.77**	.40	.35	.36	.73	.55
18.	Before I engaged in my work, my goals were clearly defined.	.13	.02	.06	**.72**	.61	.37	.56	.84	.73
10.	At work my goals were clear to me.	.19	.05	.18	**.56**	.65	.38	.63	.79	.69

Table 6.9 (continued)

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (N = 320)

		Pattern coefficients				Structure coefficients				
	Item	FBK	CHL	CTL	GLS	FBK	CHL	CTL	GLS	h^2
34.	At work I clearly understood what I needed to do.	.30	-.06	.22	.43	.67	.26	.64	.70	.62
26.	At work I regularly knew what I needed to achieve.	.29	.01	.16	.43	.64	.31	.59	.69	.57
41.	At work my demands (goals) were logically ordered.	-.30	.03	-.12	-.37	-.60	-.25	-.52	-.61	.47
EV		12.18	2.69	1.51	1.11					
% of Var.		45.74	9.41	4.52	2.82					

Note. Boldface factor loadings in the pattern matrix represent item loadings greater than .55. The eigenvalue of the fifth unretained factor was 1.04. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation.

Prior to rotation, the four factors explained a total of 62.49% of the variance, with Factors 1 through 4 explaining 45.74%, 9.41%, 4.52%, and 2.82%, respectively. As shown in Table 6.9, the pattern matrix revealed that for the FBK and CTL factors, five items loaded above .55 for each factor, four items loaded above .55 for the CHL factor, and three items loaded above .55 for the GLS factor. This same pattern was also seen in the structure coefficients matrix. The structure matrix showed good discrimination between the four factors. From Table 6.9 it can be seen that there were nine items that did not adequately load (i.e., above .55) on any of the four factors, additionally two of these items had low communality coefficient estimates (e.g., < .20), indicating that the variance among these items was not accounted for by the four factor solution. These items (items: 4, 9, 25, 26, 27, 34, 40, 41, and 48) were subsequently removed and an EFA was re-run to obtain approximate simple structure (McDonald, 1985).

6.4.3.3 Revised EFA – revised Conditions to Flow Scale.

The factorability of the correlation matrix was confirmed (presence of correlation coefficients larger than .3 and a KMO value of .94). In determining the number of factors to retain, the EFA revealed three factors with eigenvalues greater than 1 (see Table 6.10), the scree plot (see Appendix A-13) suggested a four factor solution, and parallel analysis suggested the retention of two factors. Conceptually, in line with the scree plot, it was seen as acceptable to specify a four factor solution; the fourth factor in the previous EFA contained three items that could be interpreted as a condition to flow, these items were not removed from this subsequent EFA, nor were any highly loading items removed that represented a factor.

Table 6.10

Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Four Factor Solution of the Conditions to Flow Items (N = 320)

		Pattern coefficients				Structure coefficients				
	Item	FBK	CHL	CTL	GLS	FBK	CHL	CTL	GLS	h^2
43.	At work I constantly knew if I was performing well.	**.98**	.01	-.02	-.03	.95	.38	.64	.57	.90
36.	At work I clearly knew if I was performing well.	**.91**	-.02	.05	.00	.94	.37	.68	.59	.89
28.	At work I immediately knew if I was performing well.	**-.89**	-.02	.07	-.06	-.89	-.38	-.59	-.58	.79
20.	At work I was regularly aware of how well I was performing.	**.86**	.01	.03	.04	.91	.38	.65	.59	.82
12.	At work it was clear to me how well I was performing.	**.85**	.00	.06	-.01	.88	.36	.64	.55	.77
17.	My work appropriately challenged me.	-.03	**.92**	.04	.01	.38	.93	.38	.47	.87
33.	My work appropriately challenged my skill level.	.02	**.91**	-.01	-.00	.38	.92	.35	.45	.84
47.	At work I felt appropriately challenged.	.03	**.87**	.07	-.03	.41	.89	.40	.45	.80
1.	My work appropriately challenged my capabilities.	-.01	**.86**	-.06	.05	.33	.85	.28	.43	.73
3.	I felt that I was in control of my work.	-.07	-.10	**.86**	.06	.52	.22	.81	.46	.66
35.	I felt that I had total control of my work.	.07	.01	**.85**	-.04	.65	.35	.89	.50	.79
11.	I believed that it was possible to have control of my own work.	-.00	.06	**.83**	-.02	.58	.36	.84	.48	.70
19.	At work I believed that I was able to exercise a sense of control over what I was doing.	.01	.15	**.81**	.03	.65	.48	.89	.58	.82
42.	At work I experienced a sense of control over what I was doing.	.16	.02	**.73**	.03	.69	.38	.87	.56	.77
18.	Before I engaged in my work, my goals were clearly defined.	.09	-.05	.09	**.81**	.64	.42	.60	.90	.82
2.	I had clear goals before I engaged in my work.	-.04	.05	-.05	**.77**	.43	.39	.38	.74	.55
10.	At work my goals were clear to me.	.21	.06	.24	**.42**	.66	.44	.65	.72	.63
EV		9.38	2.46	1.31	0.96					
% of Var.		53.92	13.30	6.41	3.76					

Note. Boldface factor loadings in the pattern matrix represent the items retained. The eigenvalue of the fifth unretained factor was 0.45. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation.

Prior to rotation, the four factors explained a total of 77.39% of the variance, with Factors 1 through 4 explaining 53.92%, 13.30%, 6.41%, and 3.76%, respectively. As shown in Table 6.10, the pattern matrix revealed that for the FBK and CTL factors, five items loaded above .55 for each factor, four items loaded above .55 for the CHL factor, and two items loaded above .55 for the GLS factor. However, given the high cut-off criteria it was decided to also retain the third highest item loading for this factor (item 10), which had a loading of .42, still well above the minimum .32 cut-off criteria used for retaining items (Tabachnick & Fidell, 2007). This same pattern was also seen in the structure coefficients matrix. The structure matrix showed good discrimination between the four factors: the loadings for each factor showed that the lowest loading item retained for a factor was higher than the loadings of items retained from other factors. As can be seen in Table 6.10, the revised EFA approximates simple structure (McDonald, 1985). The correlations between factors were next inspected to assess whether an oblique rotation was warranted.

Table 6.11

Conditions to Flow, Revised Four Factor Correlation Matrix (N = 320)

Factor	1	2	3	4
1. FBK	-	.40	.69	.62
2. CHL	.40	-	.38	.49
3. CTL	.69	.38	-	.57
4. GLS	.62	.49	.57	-

Note. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals.

Table 6.11 shows many factor correlations above .32, warranting the use of an oblique rotation.

6.4.3.4 Cronbach's alpha coefficients for the revised EFA – conditions to flow.

Cronbach's alpha coefficients were next computed for each randomly split subsample.

Table 6.12

Cronbach's alpha Coefficients for the Four Factors

Subsample	FBK	CHL	CTL	GLS
1	.85	.95	.93	.84
2	.85	.94	.93	.82

Note. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals.

As can be seen from Table 6.12, all four factors revealed high Cronbach's alpha coefficients, well above the acceptable minimum .60 cut-off criteria (DeVellis, 2003). Furthermore, as the four factors extracted were found to correlate (see Table 6.11), a higher-order FA was performed to assess generalisability beyond the first-order factors extracted.

6.4.3.5 Higher-order FA for the revised Conditions to Flow Scale.

All analyses were performed using SPSS IBM® statistics 19 software. To aid in the interpretation of any higher-order factor, the Schmid-Leiman solution (SLS; Schmid & Leiman, 1957) was used to obtain the independent influence of first-order factors and higher-order factor(s) on the items (Wolff & Preising, 2005). As the SLS was not built into the currently available SPSS IBM® statistics 19 software, the SPSS syntax written by Wolff and Preising (2005) was used.

6.4.3.5.1 Data screening.

In checking for normality for these four factors, it was found that all four were normally distributed. No potential univariate outliers were identified ($z > 3.29$). Linearity was confirmed by inspecting the scatter plot of the two most non-normally distributed factors. In checking for multivariate outliers, two cases were found to have Mahalanobis distance values greater than the critical value: $\chi^2(4) = 18.47$, $p < .001$ and were subsequently removed. As MI, which was previously performed for this dataset, generated five imputed data sets, only cases that were found to be multivariate outliers in all five data sets were removed. Collinearity statistics revealed no evidence of multicollinearity or singularity.

6.4.3.5.2 Higher-order FA.

The correlation matrix of the four factors of the conditions to flow was subjected to an FA, principal axis factoring. The factorability of the correlation matrix was confirmed (correlation coefficients larger than.3 and a KMO value of .79). In determining the number of factors to retain, the FA revealed a single factor with an eigenvalue greater than 1 (2.66), the scree plot (see Appendix A-14), and parallel analysis, also suggested a single factor solution, which confirmed the specification of a single factor solution. Item loadings and total and common variance explained for the higher-order Conditions to Flow factor and first-order factors can be seen in Table 6.13.

Table 6.13

Factor Structure Coefficients and Variance Sources for the Conditions to Flow Based on the Orthogonalised Higher-Order Factor Model (N = 318)

Item		Condition		FBK		CHL		CTL		GLS			
		b	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	h^2	u^2
43.	At work I constantly knew if I was performing well.	.79	62	.52	27	.00	0	-.01	0	-.02	0	.90	.11
36.	At work I clearly knew if I was performing well.	.80	65	.49	24	-.01	0	.03	0	.00	0	.88	.12
28.	At work I immediately knew if I was performing well.	-.76	57	-.48	23	-.02	0	.04	0	-.03	0	.80	.20
20.	At work I was regularly aware of how well I was performing.	.78	61	.46	21	.01	0	.02	0	.02	0	.83	.18
12.	At work it was clear to me how well I was performing.	.75	56	.45	20	.00	0	.03	0	-.01	0	.77	.23
17.	My work appropriately challenged me.	.55	31	-.02	0	.75	56	.03	0	.01	0	.87	.13
33.	My work appropriately challenged my skill level.	.54	29	.01	0	.74	55	-.01	0	-.00	0	.84	.16
47.	At work I felt appropriately challenged.	.56	31	.02	0	.71	50	.04	0	-.02	0	.82	.18
1.	My work appropriately challenged my capabilities.	.48	23	-.00	0	.70	48	-.04	0	.03	0	.72	.28
3.	I felt that I was in control of my work.	.62	39	-.04	0	-.09	1	.51	26	.03	0	.66	.34
35.	I felt that I had total control of my work.	.72	52	.04	0	.01	0	.51	26	-.02	0	.79	.21

Table 6.13 (continued)

Factor Structure Coefficients and Variance Sources for the Conditions to Flow Based on the Orthogonalised Higher-Order Factor Model (N = 318)

Item	Condition		FBK		CHL		CTL		GLS			
	b	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	h^2	u^2
11. I believed that it was possible to have control of my own work.	.68	46	-.00	0	.05	0	.49	24	-.01	0	.71	.29
19. At work I believed that I was able to exercise a sense of control over what I was doing.	.78	60	.01	0	.12	1	.48	23	.02	0	.85	.15
42. At work I experienced a sense of control over what I was doing.	.76	58	.08	1	.02	0	.44	19	.02	0	.78	.22
18. Before I engaged in my work, my goals were clearly defined.	.81	65	.05	0	-.04	0	.06	0	.44	19	.85	.15
2. I had clear goals before I engaged in my work.	.61	37	-.02	0	.04	0	-.03	0	.42	17	.54	.46
10. At work my goals were clear to me.	.76	58	.11	1	.05	0	.15	2	.23	5	.67	.33
% Total S^2		48.82		6.92		12.55		7.20		2.48	77.97	22.03
% Common S^2		62.60		8.90		16.10		9.20		3.20		

Note. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals; *b* = factor structure coefficient; %S^2 = percentage of variance; h^2 = communality coefficient; u^2 = uniqueness coefficient.

SLS results shown in Table 6.13 revealed that the higher-order Conditions to Flow factor accounted for 23% to 65% of the individual item variance, the highest portion of total variance and the highest portion of common variance. After the higher-order Conditions to Flow factor, the CHL factor was the first-order factor to account for the highest percentage of total and common variance, followed by the CTL, FBK, and GLS factors (see %Total and %Common rows in Table 6.13). All first-order factors remained consistent with the condition to flow dimensions, with their respective items having acceptable loadings, with the exception of one item (item 10) that loaded .23 on its intended GLS factor. The higher-order and first-order factors combined, explained a total of 77.97% of the variance in the conditions to flow items, resulting in 22.03% unique variance (specific and error).

6.4.3.5.3 Cronbach's alpha coefficients for the higher-order conditions to flow factor.

For the two randomly selected subsamples, Cronbach's alpha coefficients for the global Conditions to Flow factor were .93 and .92.

6.4.3.6 Initial EFA – revised Flow Scale.

The correlation matrix of the 27 items of the Flow Scale was subjected to a factor analysis, principal axis factoring with an oblique rotation (Direct Oblimin). The item correlation matrix revealed many coefficients larger than.3 and a KMO value of .93.

In determining the number of factors to retain, the EFA revealed five factors with eigenvalues greater than 1 (see Table 6.14), the scree plot (see Appendix A-15) suggested a five factor solution, and parallel analysis suggested the retention of three factors. Conceptually it was seen as acceptable to retain five factors, as the fifth factor contained three items that could be interpreted as a dimension of flow. In addition, these three items loaded above .45 (over 20% overlapping variance), which is well above the minimum .32 cut-off criteria. Furthermore, as the number of items is less than 40 and sample size is large (N = 311), the eigenvalue rule is unlikely to overestimate the number of factors and is therefore likely more reliable (Tabachnick & Fidell, 2007). It was therefore decided to specify a five factor solution.

Table 6.14

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Five Factor Solution of the Flow Items (N = 311)

		Pattern coefficients					Structure coefficients					
	Item	ORD	LOS	CON	TOT	MAA	ORD	LOS	CON	TOT	MAA	h^2
54.	At work I forgot about the problems that were in my life.	**.76**	-.05	-.05	.27	.03	.85	.18	-.48	.54	-.51	.79
51.	At work I forgot about the unpleasant aspects of life.	**.70**	.04	-.04	.23	-.06	.84	.27	-.49	.54	-.57	.78
37.	At work I forgot about my worries of everyday life.	**.60**	.05	-.14	.20	-.08	.78	.29	-.54	.53	-.57	.71
49.	At work I was unaware of other events happening around me.	.42	.21	-.11	.02	-.04	.54	.35	-.38	.30	-.39	.36
15.	During my work I did not question/doubt what I was doing.	.38	.09	-.02	-.07	-.15	.46	.20	-.23	.17	-.36	.24
44.	At work my mind did not wander away from what I was doing.	.37	.03	-.36	.06	-.07	.58	.26	-.58	.42	-.46	.49
45.	At work I was unaware of how others may have perceived me.	.31	.24	-.03	-.15	-.17	.41	.32	-.23	.12	-.36	.25
30.	At work I was unaware of who I was.	.08	**.92**	.01	.00	.06	.23	.92	-.30	.25	-.30	.84
22.	At work I lost all thought of who I was.	.04	**.87**	-.04	.06	-.02	.26	.91	-.38	.34	-.38	.85
14.	At work I was oblivious to who I was.	.18	**.76**	-.02	-.02	.05	.30	.78	-.31	.24	-.31	.63
6.	At work I forgot about who I was.	-.07	**.69**	-.05	.06	-.11	.17	.74	-.32	.29	-.35	.57
32.	At work I felt that the passage of time varied from reality.	-.05	.43	-.02	.22	-.02	.14	.50	-.26	.34	-.25	.29
5.	At work I needed to concentrate all my attention on what I was doing.	.09	.01	**.91**	.06	-.03	-.26	-.25	.83	-.38	.28	.70
13.	My work required my full concentration.	.09	.01	**.85**	-.09	-.05	-.27	-.25	.83	-.48	.29	.70
29.	At work I was fully focused on what I was doing.	-.20	.10	**.78**	-.03	-.02	-.51	-.20	.84	-.48	.40	.75
21.	At work my attention was completely absorbed in what I was doing.	-.09	-.02	**.70**	-.07	.08	-.46	-.32	.82	-.52	.47	.70

Table 6.14 (continued)

Pattern and Structure Matrix for Initial EFA with Oblique Rotation for a Five Factor Solution of the Flow Items (N = 311)

		Pattern coefficients					Structure coefficients					
	Item	ORD	LOS	CON	TOT	MAA	ORD	LOS	CON	TOT	MAA	h^2
31.	During my work I was only aware of what I was doing.	.04	.30	-.46	.01	-.13	.36	.50	-.63	.41	-.44	.51
8.	At work I was amazed at how fast time had passed.	.06	.04	-.13	**.79**	-.02	.41	.32	-.60	.90	-.47	.83
16.	At work I felt that time appeared to be going much faster than normal.	.10	.10	-.09	**.72**	-.07	.45	.37	-.58	.86	-.52	.79
24.	At work I lost track of time.	.04	.25	-.08	**.59**	-.07	.37	.47	-.53	.75	-.48	.65
38.	At work I felt that I was part of a larger system of action greater than myself.	-.13	.04	.03	-.32	.21	-.36	.16	.33	-.47	.42	.29
46.	I was so involved in my work that it felt effortless.	.18	-.12	-.01	.04	**-.73**	.57	.18	-.37	.40	-.81	.69
50.	I was so involved in my work that it almost felt automatic.	.20	-.05	-.08	.10	-.53	.54	.22	-.42	.43	-.70	.54
52.	I felt that my work progressed smoothly.	.10	-.32	-.04	-.10	.53	-.27	-.49	.30	-.37	.61	.48
7.	During my work I was unaware of how much I was concentrating.	-.13	.21	-.22	.05	-.44	.26	.42	-.45	.38	-.56	.42
39.	I was so involved in my work that it felt spontaneous.	.14	.00	-.19	.21	-.44	.53	.30	-.55	.55	-.69	.59
23.	During my work I was unaware of the amount of effort used.	.32	-.27	-.05	.13	-.40	.55	-.01	-.34	.38	-.56	.47
EV		10.92	2.79	1.81	1.25	1.02						
% of Var.		39.11	9.14	5.39	3.04	2.30						

Note. Boldface factor loadings in the pattern matrix represent item loadings greater than .55. The eigenvalue of the sixth unretained factor was 0.90. ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation.

Prior to rotation, the five factors explained a total of 58.98% of the variance, with Factors 1 through 5 explaining 39.11%, 9.14%, 5.39%, 3.04%, and 2.30%, respectively. As shown in Table 6.14, the pattern matrix revealed that for the ORD and TOT factors, three items loaded above .55 for each factor. For the LOS and CON factors, four items loaded above .55 for each factor, and for the MAA factor, only one item loaded above .55. However, given the high loading cut-off criteria it was decided to also retain the second and third highest loading items for this MAA factor (items 50 and 52). These items both loaded well above the minimum acceptable .32 cut-off criteria (-.53 and .53, respectively; Tabachnick & Fidell, 2007). A similar pattern was also seen in the structure coefficients matrix.

From Table 6.14, it can be seen that there were 10 items (items: 7, 15, 23, 31, 32, 38, 39, 44, 45, and 49) that did not adequately load on any of the five factors. These items were subsequently removed and a EFA was rerun in an attempt to obtain approximate simple structure (McDonald, 1985).

6.4.3.7 Revised EFA – revised Flow Scale.

The revised correlation matrix revealed the presence of many coefficients with values of .3 and above and a KMO value of .90. In determining the number of factors to retain, the EFA revealed three factors with eigenvalues greater than 1 (see Table 6.15), the scree plot (see Appendix A-16) suggested either a three (plotted eigenvalues break above a horizontal line drawn through Factor 4 and Factor 17) or five (plotted eigenvalues break above a horizontal line drawn through Factor 6 and Factor 17) factor solution, and parallel analysis suggested the retention of three factors. Conceptually, in line with the scree plot, it was seen as acceptable to retain five factors; the fifth factor in the previous EFA contained three items that could be interpreted as a dimension of flow. These items were not removed from this subsequent factor analysis nor were any highly loading items removed that represented a factor. It was therefore decided to specify a five factor solution.

Table 6.15

Pattern and Structure Matrix for Revised EFA with Oblique Rotation for a Five Factor Solution of the Flow items (N = 311)

		Pattern coefficients					Structure coefficients					
	Item	ORD	LOS	CON	TOT	MAA	ORD	LOS	CON	TOT	MAA	h^2
54.	At work I forgot about the problems that were in my life.	**1.02**	-.04	.02	.04	.08	.97	.23	-.46	.58	-.62	.94
37.	At work I forgot about my worries of everyday life.	**.74**	.09	-.10	.01	-.05	.85	.34	-.52	.59	-.62	.75
51.	At work I forgot about the unpleasant aspects of life.	**.71**	.08	-.01	.02	-.17	.87	.32	-.47	.59	-.69	.78
22.	At work I lost all thought of who I was.	-.03	**.92**	-.03	.06	-.02	.28	.95	-.35	.49	-.24	.90
30.	At work I was unaware of who I was.	.02	**.91**	.02	.01	.06	.23	.90	-.27	.40	-.16	.81
14.	At work I was oblivious to who I was.	.08	**.79**	.01	-.03	-.01	.28	.80	-.28	.38	-.22	.64
6.	At work I forgot about who I was.	-.02	**.73**	-.03	.02	-.05	.23	.76	-.28	.39	-.22	.57
5.	At work I needed to concentrate all my attention on what I was doing.	.02	-.03	**.88**	.06	-.04	-.36	-.27	.82	-.46	.28	.68
13.	My work required my full concentration.	.02	.00	**.86**	-.06	-.08	-.39	-.28	.86	-.54	.30	.74
29.	At work I was fully focused on what I was doing.	-.12	.05	**.71**	-.02	.12	-.56	-.25	.82	-.58	.50	.71
21.	At work my attention was completely absorbed in what I was doing.	.00	-.06	**.67**	-.10	.16	-.51	-.35	.81	-.63	.50	.70
8.	At work I was amazed at how fast time had passed.	.01	-.08	-.03	**.94**	.03	.56	.36	-.59	.92	-.52	.85
16.	At work I felt that time appeared to be going much faster than normal.	.01	.00	.01	**.86**	-.07	.57	.41	-.56	.90	-.57	.81
24.	At work I lost track of time.	.02	.13	.00	**.73**	.01	.49	.47	-.50	.80	-.45	.65
46.	I was so involved in my work that it felt effortless.	-.02	.05	.02	-.01	**-.84**	.55	.22	-.33	.48	-.83	.69
50.	I was so involved in my work that it almost felt automatic.	.00	.08	-.04	.06	**-.68**	.53	.27	-.38	.51	-.74	.57
52.	I felt that my work progressed smoothly.	-.14	.14	.04	-.04	**.57**	-.53	-.06	.33	-.42	.67	.48
EV		7.83	2.49	1.58	.91	.80						
% of Var.		44.54	13.08	7.59	4.04	3.03						

Note. Boldface factor loadings in the pattern matrix represent the items retained. The eigenvalue of the sixth unretained factor was 0.51. ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness; h^2 = communality coefficient; EV = eigenvalue; % of Var. = percentage of variance prior to rotation.

Prior to rotation, the five factors explained a total of 72.28% of the variance, with Factors 1 through 5 explaining 44.54%, 13.08%, 7.59%, 4.04%, and 3.03%, respectively. As shown in the pattern matrix in Table 6.15, for the ORD, TOT, and MAA factors, three items loaded above .55 for each factor and for the LOS and CON factors, four items loaded above .55 for each factor. This same pattern was also seen in the structure coefficients matrix. The structure matrix showed good discrimination between the five factors: the loadings for each factor showed that the lowest loading item retained for a factor was higher than the loadings of retained items from other factors, except for the MAA factor which had one item (item 51) that loaded slightly higher than the lowest retained item for that factor. In an oblique rotation, factors are allowed to correlate and therefore when there is overlap between factors, this can result in inflated loadings in a structure matrix (Tabachnick & Fidell, 2007). In the pattern matrix, which has the overlap among factors partialed out, it can be seen that item 51 did not substantially load on the MAA factor, suggesting that the high loading revealed in the structure matrix for this item is an inflated loading due to the overlap among factors. As can be seen in Table 6.15, the revised EFA approximates simple structure (McDonald, 1985); each item loaded highly on only one factor and no complex items were found. The correlations between factors were next inspected to assess whether an oblique rotation was warranted.

Table 6.16

Flow, Revised Five Factor Correlation Matrix (N = 311)

Factor	1	2	3	4	5
1. ORD	-	.27	-.50	.61	-.68
2. LOS	.27	-	-.32	.46	-.22
3. CON	-.50	-.32	-	-.62	.41
4. TOT	.61	.46	-.62	-	-.58
5. MAA	-.68	-.22	.41	-.58	-

Note. ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness.

From Table 6.16, it can be seen that the presence of correlations above .32 warrant the use of an oblique rotation.

6.4.3.8 Cronbach's alpha coefficients for the revised EFA – flow.

Cronbach's alpha coefficients were next computed for each factor in both randomly split subsamples.

Table 6.17

Cronbach's alpha Coefficients for the Four Factors

Subsample	ORD	LOS	CON	TOT	MAA
1	.93	.92	.88	.91	.68
2	.91	.91	.91	.90	.72

Note. ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness.

As can be seen in Table 6.17, all five factors revealed acceptable Cronbach's alpha coefficients. Furthermore, as the five factors extracted were found to correlate (see Table 6.16), a higher-order FA was performed.

6.4.3.9 Higher-order FA for the revised Flow Scale.

6.4.3.9.1 Data screening.

In checking for normality for these five factors, it was found that all were normally distributed. No potential univariate outliers were identified ($z > 3.29$). Linearity was confirmed by inspecting the scatter plot of the two most non-normally distributed factors and no multivariate outliers were identified. Collinearity statistics revealed no evidence of multicollinearity or singularity.

6.4.3.9.2 Higher-order FA.

The correlation matrix of the five factors of flow was subjected to an FA, principal axis factoring. The correlation matrix revealed the presence of many coefficients with values above .3 and the obtained KMO value was .78. In determining the number of factors to retain, the FA revealed a single factor with an eigenvalue greater than 1 (3.09), the scree plot (see Appendix A-17), and parallel analysis also suggested a single factor solution, which confirmed the specification of single factor solution. Item loadings and total and common variance explained for the higher-order Flow factor and first-order factors can be seen in Table 6.18.

Table 6.18

Factor Structure Coefficients and Variance Sources for Flow Based on the Orthogonalised Higher-Order Factor Model (N = 311)

	Flow		ORD		LOS		CON		TOT		MAA			
Item	*b*	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	*B*	%S^2	h^2	u^2
54. At work I forgot about the problems that were in my life.	.75	56	.62	39	-.04	0	.02	0	.02	0	.05	0	.96	.05
37. At work I forgot about my worries of everyday life.	.74	55	.45	20	.09	1	-.07	0	.00	0	-.03	0	.77	.24
51. At work I forgot about the unpleasant aspects of life.	.76	57	.44	19	.07	0	.00	0	.01	0	-.11	1	.78	.22
22. At work I lost all thought of who I was.	.46	21	-.02	0	.83	68	-.02	0	.03	0	-.01	0	.90	.10
30. At work I was unaware of who I was.	.37	14	.01	0	.82	67	.01	0	.01	0	.04	0	.80	.20
14. At work I was oblivious to who I was.	.39	15	.05	0	.71	50	.00	0	-.01	0	.00	0	.65	.35
6. At work I forgot about who I was.	.38	14	-.01	0	.66	44	-.02	0	.01	0	-.03	0	.58	.42
5. At work I needed to concentrate all my attention on what I was doing.	-.53	28	.01	0	-.02	0	.63	39	.03	0	-.03	0	.67	.33
13. My work required my full concentration.	-.59	34	.01	0	.00	0	.62	38	-.03	0	-.05	0	.73	.28
29. At work I was fully focused on what I was doing.	-.68	47	-.08	1	.05	0	.51	26	-.01	0	.08	1	.74	.26
21. At work my attention was completely absorbed in what I was doing.	-.70	49	.00	0	-.05	0	.48	23	-.04	0	.10	1	.73	.27
8. At work I was amazed at how fast time had passed.	.82	67	.01	0	-.07	0	-.02	0	.43	18	.02	0	.85	.15

Table 6.18 (continued)

Factor Structure Coefficients and Variance Sources for Flow Based on the Orthogonalised Higher-Order Factor Model (N = 311)

Item	Flow		ORD		LOS		CON		TOT		MAA			
	b	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	*b*	%S^2	*B*	%S^2	h^2	u^2
16. At work I felt that time appeared to be going much faster than normal.	.82	67	.00	0	.00	0	.01	0	.39	15	-.04	0	.83	.18
24. At work I lost track of time.	.72	52	.01	0	.12	1	.00	0	.33	11	.01	0	.64	.36
46. I was so involved in my work that it felt effortless.	.63	40	-.01	0	.05	0	.01	0	.00	0	-.54	29	.69	.31
50. I was so involved in my work that it almost felt automatic.	.64	40	.00		.07	0	-.03	0	.03	0	-.43	19	.60	.40
52. I felt that my work progressed smoothly.	-.55	30	-.09	1	.13	2	.03	0	-.02	0	.37	13	.46	.54
% Total S2		40.35		4.69		13.79		7.44		2.64		3.83	72.74	27.26
% Common S2		55.50		6.50		19.00		10.20		3.60		5.30		

Note. ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness; *b* = factor structure coefficient; %S^2 = percentage of variance; h^2 = communality coefficient; u^2 = uniqueness coefficient.

The SLS results shown in Table 6.18 revealed that the higher-order Flow factor accounted for 14% to 67% of the individual item variance, the highest portion of total variance, and the highest portion of common variance. After the higher-order Flow factor, the LOS factor was the first-order factor to account for the highest percentage of total and common variance, followed by the CON, ORD, MAA, and TOT factors (see %Total and %Common rows in Table 6.18). All first-order factors remained consistent with the dimensions of flow with their respective items having acceptable loadings. The higher-order and first-order factors combined, explained a total of 72.74% of the variance in the flow items, resulting in 27.26% unique variance (specific and error).

6.4.3.9.3 Cronbach's alpha coefficients for the higher-order flow factor.

For the two randomly selected subsamples, Cronbach's alpha coefficients for the global Flow factor were .92 and .88, well above the acceptable minimum .60 criteria (DeVellis, 2003).

6.4.4 Study 2 discussion.

The aim of the present study was to improve the internal consistency and factor structure of the developed Conditions to Flow Scale and Flow Scale found in Study 1. In this study, a number of revisions were made to the developed scales and the revised version was administered to another recruited sample. The results from the current study demonstrate that the revised scales capture all the proposed dimensions that can be considered conditions to and dimensions of flow (Nakamura & Csikszentmihalyi, 2002). Additionally, the psychometric properties of the revised scales were well above the minimum requirements recommended for a scale. This study also provided evidence of higher-order factors for both the Conditions to Flow Scales and the Flow Scales; suggesting that for both scales, items can be represented by a single interpretable global factor, that is, a single score representing the conditions to flow and a single score representing the flow experience.

For the Conditions to Flow Scales, a four factor solution was found with each factor representing one of the proposed conditions to flow. The Feedback and Control factors were found to comprise of five items each, the Appropriate Challenge factor comprised of four items, and the Clear Goals factor comprised of three items. All items were found to load well above the .55 cut-off criteria, with the exception of one retained item, which still had an acceptable loading of .42, well above the minimum .32 cut-off criteria as suggested by Comrey and Lee (1992). All items appropriately loaded on their intended factors, with no complex items, approximating simple structure (McDonald, 1985). Mean Cronbach's alpha coefficients for the four factors across the two randomly split subsamples (Feedback α = .85, Appropriate Challenge α = .94, Control α = .93, and Clear Goals α = .83), were all well above the recommended minimum of .60 (DeVellis, 2003).

For the Flow Scales, a five factor solution was found with each factor representing one of the known dimensions of flow, with the exception of the deep concentration dimension, which was found to contain two interpretable factors: Deep Concentration and Order in Consciousness. The Order in Consciousness, Transformation of Time, and Merging of Action and Awareness factors were found to comprise of three items each. The Loss of Self-Consciousness and Deep Concentration factors comprised of four items each. Having chosen a modest .55 cut-off criteria, all items appropriately loaded on their intended factors, with no complex items present, so the solution approximated a simple structure (McDonald, 1985). Mean Cronbach's alpha coefficients for the five factors across the two randomly split subsamples (Order in Consciousness α = .92, Loss of Self-Consciousness α = .91, Deep Concentration α = .89, Transformation of Time α = .90, and Merging of Action and Awareness α = .70) were all above the recommended minimum of .60 (DeVellis, 2003).

As discussed in the previous chapter, Csikszentmihalyi's (2002) description of the deep concentration dimension incorporates both a complete concentration aspect and also an ordering of consciousness aspect. As was the case with the original Flow Scale in Study 1, this revised scale also showed that there were two distinguishable factors for Csikszentmihalyi's deep concentration dimension: One being the experience of deep concentration, as seen by items 5, 13, 29, and 21, and the other being the experience of order in consciousness, as seen by items 54, 37, and 51. Order in consciousness is described by Csikszentmihalyi (2002) as a complete focusing of attention, so much so, that there is no available psychic energy left to process non-task related information that typically absorbs our attention in normal everyday life, such as daily problems, worries, and frustrations. Items 54, "*At work I forgot about the problems that were in my life*"; 37, "*At work I forgot about my worries of everyday life*"; and 51, "*At work I forgot about the unpleasant aspects of life*", capture this experience of flow.

The revisions made to these two scales substantially improved their psychometric properties. Removing the negatively keyed items, additional rewording of items, revised responding format, and the rewording of the preamble, improved both factorial validity and also internal consistency for scales.

The results from the higher-order FA revealed both a global factor for the conditions to flow and also a global factor for the flow experience. Both the global Conditions to Flow and Flow factors were found to be internally consistent with mean Cronbach's alpha coefficients across the two subsamples of .93 and .90, respectively. For both scales, the results suggest that scores can be interpreted on two levels. At a narrow level, each of the specific dimensions to and of flow can be examined. For example, it may be possible to identify specific conditions to flow that are present or absent in the workplace (e.g., clear goals or feedback), which previously may not have been easy to identify. Identifying specific flow-relevant conditions in the workplace may allow organisations to develop more direct and cost effective interventions or workplace changes that specifically target conditions lacking, rather than targeting a range of conditions within the workplace, which may not necessarily be required. On a more global level, the total frequency with which employees experience the conditions to flow or flow itself can also be examined, which may be useful for ongoing monitoring to ensure employees are experiencing the conditions to flow overall and that they are experiencing flow at work. If this monitoring reveals low levels, interpretation of scores at the narrow (subscale) level can be used to specifically identify what may be preventing employees from experiencing flow. Both levels of interpretation (narrow and global) may also be useful in the evaluation of interventions/programs or workplace changes, where pre and post data could be compared to examine their effectiveness.

Csikszentmihalyi (2002) suggests that activities can be conducive to flow if they allow for an appropriate balance between challenge and skill, control, have clear goals, and provide feedback. Examples of such flow activities include chess, basketball, and painting. The presence of a global factor for the conditions to flow (i.e., appropriate balance between challenge and skill, control, clear goals, and control) found in the present study is consistent with Csikszentmihalyi's suggestion of possible flow activities and also suggests that such activities are present in the workplace. The presence of a global factor for the conditions to flow also offers support for the suggestion that, when a number of the conditions are present at the same time, they are likely conducive to the flow experience (Csikszentmihalyi, 1999, 2002; Nakamura & Csikszentmihalyi, 2009).

The presence of a global factor for the dimensions considered to represent the flow experience (i.e., deep concentration, order in consciousness, loss of self-consciousness, merging of action and awareness, and transformation of time), suggests that combined, they represent the flow experience. This is consistent with flow theory, which suggests that the flow experience involves a full concentration on the activity at hand, where distractions (i.e., everyday worries and frustrations and the concept of who we are) are absent, actions and awareness merge, and the passage of time is perceived to be distorted (Csikszentmihalyi et al., 2005; Fullagar et al., 2012; Nakamura & Csikszentmihalyi, 2009).

It is believed that the revised Flow Scale is superior to other currently known methods for assessing flow in the workplace. It is the only known scale that captures all the dimensions believed to represent the flow experience, as described by flow theory, without confounding antecedents or outcomes. Furthermore, the scale is psychometrically sound at the global (scale) and narrow (subscale) level. Similarly, the revised Conditions to Flow Scale is the only known scale that likely captures the conditions to flow, as described by flow theory, without confounding variables, and is also psychometrically sound at the global (scale) level and narrow (subscale) level. Despite these findings, it is suggested that future research is still needed to replicate these findings and to further test the validity of these scales.

6.5 Conclusion

The studies in this chapter aimed to develop and evaluate a scale to measure the conditions to flow and a scale to measure the flow experience at work. The scales that were initially developed (Study 1) were problematic as it was shown that there were issues with internal consistency and factor structure. This was taken as evidence that the target dimensions were not adequately captured. In particular, the dimensions that proved to be problematic were appropriate challenge, feedback, merging of action and awareness, and loss of self-consciousness. Based on the findings from the first study a second attempt was made to improve the two developed scales (Study 2). Guided by results from Study 1 and psychometric literature, a number of changes were made to the items and the instructions. These changes substantially improved the psychometric properties of the revised scales. In particular, each intended dimension was represented by a single factor, with the exception of one (i.e., deep concentration), which resulted in two interpretable factors (i.e., complete concentration and order in consciousness). All factors were also found to be internally consistent. Additionally, it was also revealed that the revised scales can be interpreted on two levels. First, at a first-order level, factors were extracted that represent dimensions corresponding either to conditions to flow or to aspects of the flow experience. Second, at a higher-order, more global, level, two factors were extracted representing either a general conditions to flow or a general experience of flow score, respectively. It is believed that the revised Conditions to Flow Scale and Flow Scale are the only known psychometrically sound scales suitable for the workplace that likely capture all the dimensions to and of flow as described by flow theory.

Chapter 7

Validity of the Conditions to Flow and Flow Scales

7.1 Overview

In the previous chapter, analyses yielded good psychometric properties in terms of factor structures and internal consistency for the revised scales. However, further research is required to provide evidence of validity. This chapter presents a series of studies that examined the validity of both the Condition to Flow and Flow Scales.

7.2 Introduction

As previously mentioned in Chapter 5, the appropriate development of a scale requires rigorous testing to ensure that the scale has evidence of both reliability and validity. The results presented in Chapter 6 provided evidence of reliability (internal consistency), and content and factorial validity for both scales. This chapter seeks to further examine the validity of the scales by examining known group, discriminant, convergent, and further factorial validity.

7.2.1 Known group validity.

Previous research has shown that there are known occupation differences in the amount of flow experienced (LeFevre, 1988; Morgan, 2005). LeFevre (1988) found that flow was experienced more frequently among employees who were in higher skilled occupations (managers and engineers) than less skilled occupations (clerical and assembly line workers). LeFevre suggested that this may be due to the differences in job characteristics. The high-skilled jobs were suggested to offer more challenges and flexibility, which provides for more control, and allows employees to select challenges that match their skills. The less-skilled jobs, on the other hand, typically involve simple, non-challenging, tasks that are repetitious and lack flexibility, which results in a lack of control. In a study conducted by Morgan (2005), teachers were found to experience more flow than other occupations (those in IT/ telecommunication, banking/finance, marketing/PR, and administration sectors). It is believed that this is largely a result of the challenging nature of teaching and the regular feedback received from their students as they develop and succeed in the classroom (Morgan, 2005). Surgeons also often experience flow at work (Csikszentmihalyi, 1975). It is believed that this is due to surgery containing a number of the conditions necessary for the flow experience. For example, before surgery, goals are clearly defined and during surgery, surgeons are provided with immediate and continuous feedback (e.g., the absence/presence of blood in the cavity and computer monitoring systems both inform the surgeon how the operation is going). Surgery also requires a great deal of precision and efficiency, so there is also no lack of challenge either (Csikszentmihalyi, 1975, 2002).

The studies reviewed above assume that the observed flow experiences were due to state-like characteristics, rather than trait-like characteristics, meaning that flow is the result of the working conditions and not due to personality factors. However, early in Csikszentmihalyi's (1975) research career, he acknowledged the possibility that flow may also be due to trait-level characteristics, as in his research it was noticed that some people were able to experience flow in anti-flow activities (i.e., activities that were not conducive to flow), whereas others required a high level of external rewards even in activities that were considered highly conducive to flow (Csikszentmihalyi, 1975). The possible influence of trait-level characteristics on flow was seen in a case study conducted by Massimini and Carli (1988), where it was found that one student almost never experienced flow, while another classmate experienced flow one third of the time. In a study of talent development during adolescence, Csikszentmihalyi et al. (1993) compared a group of talented teenagers, those who excelled in mathematics, science, music, art, or athletics, to a group of average performing teenagers (normative samples). Comparisons between groups revealed that the talented group experienced more flow to their average performing counterparts, as measured by the ESM. To examine possible reasons why the talented group differed from the average comparison group, they examined personality attributes of the two samples using the Jackson's Personality Research Form (PRF) and found that the talented teenagers scored significantly higher on personality factors: Sentience, Understanding, Achievement, and Endurance. Csikszentmihalyi et al. (1993) believed that these factors represent an *autotelic personality* (see Chapter 3, page 23 for definition) and that these attributes, commonly found among talented teenagers, help to facilitate the flow experience, which in turn results in the potential for personal growth and excellence. It has since been suggested that there are several trait-like meta-skills that enable individuals to experience flow more often and in less flow producing activities. These meta-skills include: general curiosity, interest in life, persistence, and low self-centeredness (Nakamura & Csikszentmihalyi, 2002). Combined, these meta-skills have been suggested to represent an autotelic personality (Nakamura & Csikszentmihalyi, 2002). Given that there are possible state and trait-like antecedents to flow, it is likely that trait-level characteristics may also influence how often flow is experienced. However, the studies cited above did not examine the influence trait level characteristics (i.e., autotelic personality) may have had on the frequency with which flow was experienced.

7.2.2 Discriminant validity.

Evidence of discriminant validity occurs when a scale is found to be unrelated to other measures that are known to be unrelated (DeVellis, 2003). As constructs being measured by self-reports can potentially be confounded by social desirable responding, the scale development literature recommends that newly developed scales be assessed to determine whether or not scores are influenced by social desirable responding (DeVellis, 2003). Social desirable responding occurs when retrieved information is adjusted and construed so that responses reflect the respondent in a more positive way as determined by society (Holtgraves, 2004). To provide evidence of discriminant validity and to ensure scores on a scale are not likely confounded by one's need to portray themselves in a more positive way, a scale that does not aim to measure social desirable responding or a related construct should not be highly associated with a measure of social desirable responding. While it is acknowledged that there are also other suitable contrasts that can be used to provide evidence of discriminant validity, the present researcher believes it important to establish that the developed scales are not influenced by social desirable responding: It is a construct that is relatively easily measured (DeVellis, 2003), and existing scales have been found to be reliable and valid (Paulhus, 1988).

7.2.3 Convergent validity.

Employee engagement was used as a measure to test convergent validity of the flow scales. In particular, this construct was chosen because, as was discussed in Chapter 4, it is generally accepted that, employee engagement represents a high level of vigour and identification with one's work (i.e., merging of self in role; A. B. Bakker et al., 2008). Flow is similar to employee engagement, in that it also incorporates both these vigour and identification dimensions. When in flow, all available psychic energy is directed towards the task at hand and one enters into a state of complete concentration, which represents a high degree of vigour. Often when in flow, one also experiences a loss of self-consciousness and a merging of self with activity, "You don't see yourself as separate from the activity" (Csikszentmihalyi, 2002, p. 53), which represents a strong identification with the activity/task at hand. Absorption, is another characteristic that is experienced in both flow and employee engagement. A high level of absorption is represented by the deep concentration experienced during flow (Csikszentmihalyi, 2002), and in the employee engagement literature, absorption represents full concentration on one's work (Schaufeli et al., 2002). Additionally, as mentioned in Chapter 4, both employee engagement and flow have a number of similar antecedents namely, control, workload/appropriate balance between challenge and skill (Hakanen et al., 2006; Maslach et al., 2001), feedback, and clear goals (Macey & Schneider, 2008). Given these similarities, it is therefore likely that there is some conceptual overlap between flow and employee engagement. Furthermore, empirical evidence suggests a conceptual overlap between flow and employee engagement (Rupayana, 2008). Using a sample of 450 business school students, CFA provided evidence of convergent validity between flow and employee engagement as measured by the WOLF and Utrecht Work Engagement Scale (UWES-9) scales, respectively (Rupayana, 2008). However, as argued in Chapter 4, employee engagement and flow are not necessarily one and the same and should still be considered distinct concepts. In this chapter, it is argued that employee engagement is better suited to test convergent validity than other possible constructs, such as peak experience or organisational citizenship behaviour. This is because employee engagement has many similarities to flow. First, it is specifically a workplace construct, which is the same context for which the Flow Scale was designed. Second, employee engagement is easily measurable with established evidence of reliability and validity (i.e., UWES-9). Third, there is empirical evidence that employee engagement is related to flow.

7.2.4 Factorial validity.

Confirmatory Factor Analysis (CFA) is beginning to play a major role in the field of scale development, as it has much to offer in the scale development process. First, CFA adds to the factorial validity of the scale, further confirming that the factor structure is sound. Second, rather than testing a single proposed model, CFA provides further validity of a model by comparing multiple competing models to determine superior model fit. Finally, through examining competing models, CFA can also provide further information about the dimensionality of the scale (i.e., by examining how items and constructs within a scale are related; Noar, 2003).

7.2.5 Objectives of the studies.

The aims of the studies in the present chapter were:

(a) Given the literature shows consistent differences between high-skilled and low-skilled occupations and describes the possible reasons for these differences, the present research aimed to examine if the Conditions to Flow and the Flow scales discriminate between high-skilled and low-skilled occupations.

(b) As self-report measures have the potential to be contaminated by social desirable responding, the second aim was to examine whether scores both on the Conditions to Flow and the Flow Scales were associated with social desirable responding.

(c) As the concept of employee engagement is similar to flow, the third aim was to examine whether scores on the Flow Scale were associated with employee engagement.

(d) Using CFA, the fourth aim was to examine whether the previously found factor structure for both the Conditions to Flow and Flow Scales would be confirmed in a new independent sample.

7.3 Study 3: Known Group and Discriminant Validity

7.3.1 Overview.

The present study aimed to examine the known group and discriminant validity of the two developed scales. Known group validity was examined by demonstrating differences in scores on the Conditions to Flow Scale, and Flow Scale between a group of employees in high-skilled occupations versus a group of employees in low-skilled occupations. For group comparisons with the Flow Scale, the possible confounding influence of autotelic personality was to be controlled for if warranted (i.e., if it was found to be associated with the Flow Scale). Discriminant validity was tested by examining the degree of association between the Conditions to Flow and Flow Scales, and Social Desirable Responding (Self-Deceptive Positivity and Impression Management). It was hypothesised that, employees in high-skilled occupations would score higher on the Conditions to Flow Scale than employees in low-skilled occupations. Similarly, it was hypothesised that, employees in high-skilled occupations would score higher on the Flow Scale than employees in low-skilled occupations, after having controlled for autotelic personality. Additionally, it was hypothesised that Social Desirable Responding (Self-Deceptive Positivity and Impression Management) would not be largely associated with the Conditions to Flow Scale and Flow Scale.

7.3.2 Method.

7.3.2.1 Participants.

A convenience sample of 314 participants was recruited. To recruit the two groups that were anticipated to be “high” and “low” flow groups, clerical workers were recruited to comprise the low-flow group, and managers, surgeons, and teachers were recruited to comprise the high-flow group. Using the most recently available Australian and New Zealand Standard Classification of Occupations (ANZSCO; Trewin & Pink, 2006), participant's reported current occupation was used to classify participants into either the high or low-flow groups. The ANZSCO is a system of classification of occupations based on skill level. Occupational skill level is determined by the level of formal education/training, work experience, and on-the-job training required to perform occupational tasks (Trewin & Pink, 2006). The decision to classify occupations based on skill level into either the low-flow or high-flow group was guided by previous research, reviewed earlier in section 7.2.1, which has found that low-skilled occupations (e.g., clerical workers) experience less flow than high-skilled occupations (e.g., teachers, surgeons, and managers). One hundred and forty two participants formed the low-flow group. This group comprised of receptionists (n = 89, 62.7%), personal assistants (n = 6, 4.2%), secretaries (n = 21, 14.8%), and other clerical and administrative workers (n = 26, 18.3%). One hundred and seventy two participants were recruited into the high-flow group. This group comprised of school teachers (n = 130, 75.6%), tertiary education teachers (n = 2, 1.1%), miscellaneous educational professionals (n = 15, 8.7%), surgeons (n = 21, 12.2%), and managers (n = 4, 2.3%). The ANZSCO has an occupational skill rating of 1 (high) to 5 (low). Occupations in the low-flow group had a low skill rating of either a 3 or 4 (M = 3.81, SD = 0.39) and the high-flow group all had a high skill rating of 1. Further characteristics of both groups and the total sample (groups combined) are presented in Table 7.1.

Table 7.1

Demographic Characteristics of the Low and High-Flow Groups, and Total Sample (Groups Combined)

	Low-flow group (*n* = 142)				High-flow group (*n* = 172)					Groups combined (*N* = 314)
	Receptionist (*n* = 89)	Personal Assistant (*n* = 6)	Secretary (*n* = 21)	Other Clerical and Admin. Worker (*n* = 26)	School Teacher (*n* = 130)	Tertiary Education Teacher (*n* = 2)	Misc. Education Professional (*n* = 15)	Surgeon (*n* = 21)	Manager (*n* = 4)	
Age	28.18 (11.38)	44.83 (14.47)	40.50 (14.70)	35.81 (13.58)	37.04 (10.32)	36.00 (5.66)	33.33 (10.41)	39.00 (13.24)	35.75 (12.34)	34.71 (12.23)
Gender (% Female)	95.5%	100%	100%	100%	85.4%	100%	93.3%	61.9%	75%	89.5%
Mean weekly hours worked (*SD*)	33.77 (11.24)	41.67 (6.65)	33.05 (9.55)	35.94 (6.04)	33.63 (12.63)	15.00 (0.00)	29.46 (16.83)	60.71 (10.16)	35.67 (9.29)	35.53 (13.47)
Mean job tenure in years (*SD*)	2.12 (1.96)	5.47 (4.78)	8.41 (8.21)	6.53 (7.52)	8.40 (8.39)	1.50 (0.71)	5.61 (4.26)	9.35 (9.00)	4.25 (1.50)	6.27 (7.31)
Yearly income ($AUD)										
$\leq$ $40,000	84.2%	16.7%	52.3%	38.5%	16.9%	50.0%	26.7%	0.0%	0.0%	39.5%
$40,001 - $80,000	12.4%	83.3%	47.7%	57.7%	60.0%	50.0%	20.0%	23.8%	50.0%	41.4%
$\geq$ $80,001	0.0%	0.0%	0.0%	0.0%	15.4%	0.0%	26.7%	71.4%	0.0%	12.4%
Did not wish to divulge	3.4%	0.0%	0.0%	3.8%	6.9%	0.0%	26.7%	4.8%	50.0%	6.4%
Did not respond	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.3%
Education										
Did not finish School	9.0%	0.0%	4.8%	3.8%	0.8%	0.0%	0.0%	0.0%	0.0%	3.5%
High School (Year 7 – 12)	42.7%	33.3%	38.1%	42.4%	0.8%	0.0%	6.7%	0.0%	25.0%	19.7%
Higher education	48.3%	66.7%	57.1%	53.8%	98.4%	100%	93.4%	100%	75.0%	76.8%

Note. Values in brackets represent standard deviations.

7.3.2.2 Measures.

Demographic measures: A small set of demographic questions was asked that gathered information about participants' age, gender, education, occupation, average weekly hours of employment, job tenure, and income (see Appendix A-10 for the questions).

Conditions to Flow Scale: The Conditions to Flow Scale developed in Study 2 in the previous chapter was used in this study. The scale consists of 17 items representing four subscales: Appropriate Challenge (4 items; e.g., "*My work appropriately challenged my capabilities"*), Clear Goals (3 items; e.g., "*I had clear goals before I engaged in my work"*), Feedback (5 items; e.g., "At work it was clear to me how well I was performing"), and Control (5 items; e.g., "*I felt that I was in control of my work"*). Participants respond to each item using a 6-point Likert type scale: 0 = *never*, 1 = *almost never*, 2 = *seldom*, 3 = *sometimes*, 4 = *usually,* and 5 = *almost always*. Cronbach's alpha coefficients for the Conditions to Flow Scale in this sample were (high/low-flow group): .93/.94 (see Appendix A-18 for scale). To obtain a Conditions to Flow Scale score, for each respondent, the mean item score of each subscale was calculated (i.e., adding the item scores in each subscale and dividing them by the number of items in each subscale) and the computed mean item scores of the four subscales were added.

Flow Scale: The Flow Scale developed in Study 2 in the previous chapter was used in this study. The scale consists of 17 items representing five subscales: Order in Consciousness (3 items; e.g., *"At work I forgot about the problems that were in my life")*, Loss of Self-Consciousness (4 items; e.g., *"At work I lost all thought of who I was"*), Deep Concentration (4 items; e.g., "*At work I needed to concentrate all my attention on what I was doing*"), Transformation of Time (3 items; e.g., *"At work I was amazed at how fast time had passed"*), and Merging of Action and Awareness (3 items; e.g., *"*I was so involved in my work that it felt effortless*"*). Participants respond to each item using a 6-point Likert type scale: 0 = *never*, 1 = *almost never*, 2 = *seldom*, 3 = *sometimes*, 4 = *usually,* and 5 = *almost always*. Cronbach's alpha coefficients for the Flow Scale in this sample were (high/low-flow group): .87/.89. To obtain a Flow Scale score, for each respondent, the mean item score of each subscale was calculated (i.e., adding the item scores in each subscale and dividing them by the number of items in each subscale) and the computed mean item scores of the five subscales were added (see Appendix A-18 for scale).

Autotelic Personality: Four scales from the Personality Research Form (PRF) have been suggested by Csikszentmihalyi, Rathunde et al. (1993) to represent an autotelic personality. Each of the scales consists of 16 statements. Participants respond using a binary, *true* or *false* option format (D. N. Jackson, 1984). The scales include: Achievement (e.g., *"People should be more* *involved in their work"*), Endurance (e.g., *"When I hit a snag in what I am doing, I don't stop until I have found a way to get around it"*), Sentience (e.g., *"The motion of water in a river can almost hypnotise me"*), and Understanding (e.g., *"I have read several books on one topic at the same time"*). Scores in each of the scales range from 0 to 16. The observed Cronbach's alphas for the Achievement, Endurance, Sentience, and Understanding scales in this sample were (high/low-flow group): .75/.70, .69/.73, .70/.72, and .67/.73, respectively. Due to a licensing agreement, it was not possible to include a copy of these four scales in appendices. However, a copy can be purchased through SIGMA Assessment Systems, Inc.

Balanced Inventory of Desirable Responding (BIDR): The BIDR is a 40 item instrument comprising of two scales. The Self-deceptive Positivity scale measures the tendency to respond in a positive bias using 20 items (e.g., "*I am a completely rational person*"). The Impression Management scale measures deliberate self-presentation with 20 items (e.g., "*I never swear*"). Respondents rate each statement on a 7-point scale: 1 = *not true* to 7 = *very true*. The scale is equally balanced with negatively and positively keyed statements. The scale is scored by rating a score of 1 for every extreme response (i.e., 6 or 7). All 40 items are added to give a total score of social desirable responding, with larger values indicating that a respondent is likely to portray themselves in a more positive way as determined by society. The reported internal consistency (Cronbach's alpha coefficients) for the total scale, and Self-Deceptive Positivity and Impression Management subscales are .83, .74, and .81, respectively (Paulhus, 1988). In the present study Cronbach's alpha coefficients for the total scale and subscales (Self-Deceptive Positivity and Impression Management) were .79, .67, and .77, respectively (see Appendix A-19 for the scale).

7.3.2.3 Procedure.

This study received ethics approval from Australian Catholic University Human Research Ethics Committee (HREC); study HREC approval register No. V2010 90 (see Appendix A-20). Participants were recruited through an advertisement displayed on the social networking website, Facebook. The advertisement asked potential participants whether they could spare 30 minutes to complete an anonymous online survey for PhD research into life at work. Age (i.e., 18 and over) and occupation (i.e., clerical workers, managers, surgeons, and teachers) filters were employed to specifically target those participants suitable for participation. To participate, potential participants clicked on the brief advertisement which then directed them to a separate website containing a participant information sheet (see Appendix A-21), followed by the online questionnaire. The participant information sheet and online questionnaire were hosted by www.psychdata.com. Participants submitted their responses to a secure electronic database as they progressed through the questionnaire web pages. Participation was anonymous, with informed consent implied following the submission of their electronic data. They also had the opportunity to enter into a draw to win two movie tickets for their participation. To ensure anonymity for the movie ticket draw, participants were instructed to email the researcher the generic study code that was displayed on the final questionnaire webpage. As the same code was used for all participants, it was not possible to link submitted participant data to email addresses. Participation was voluntary. However, once their data were submitted (i.e., participant forward clicked onto the next questionnaire webpage), participants were unable to withdraw their responses. They also had the opportunity to request a report of the study findings by contacting the researcher via email.

7.3.2.4 Data analysis.

There is little empirical research that has examined the effects autotelic personality has on the frequency of flow experiences. Therefore, correlations between autotelic personality and the Flow Scale and subscale scores were examined to determine if controlling for autotelic personality was warranted when examining group differences (i.e., high and low-flow) in the Flow Scale scores. As recommended by Tabachnick & Fidell (2007), substantial correlations between covariates and dependent variables warrant the inclusion of covariates. However, in the present study, the four scales from the PRF, said to represent an autotelic personality, were not found to substantially correlate with the Flow Scale or any of the flow subscales. The highest correlation was found between the Flow Scale and the Achievement PRF scale, $r = .249$ (6.2% shared variance; $N = 172$). Given the small associations between the proposed four autotelic personality dimensions and flow, it was decided that controlling for autotelic personality was unwarranted.

To examine the known group validity for both the Conditions to Flow and Flow Scales, a multivariate analysis of variance (MANOVA) was used to determine if there were statistically significant differences between low and high-flow groups on the Conditions to Flow and Flow Scales. Effect sizes, eta squared (η^2), were interpreted according to guidelines proposed by Cohen (1988); .01 = a small effect, .06 = a moderate effect, and .14 = a large effect.

Pearson's product-moment correlations were used to examine the possible associations between each of the two flow scales (i.e., Conditions to Flow Scale and Flow Scale) and the Social Desirable Responding Scale and the two components of the Social Desirable Responding Scale (i.e., Self-Deceptive Positivity and Impression Management subscales). Correlations were also disattenuated to control for imperfect reliability. Correlations were interpreted using Cohen's (1988) guidelines.

7.3.3 Results.

Prior to analysis, data were screened for missing data, out of range variables, normality, potential univariate and multivariate outliers, linearity, and homogeneity of variance-covariance matrices.

In assessing the amount of missing data, it was found that participant attrition (participants who responded to at least one item but responded to less than 60% of the items for a scale) accounted for 37.6% of the sample and missing data due to item non-response ranged from 0.0% to a high of only 5.1% for items that constitute the scales. For the Conditions to Flow Scale, missing data due to item non-response was greater than 5.0% for the following items: "*At work I clearly knew if I was performing well" (5.1%), "At work I constantly knew if I was performing well" (5.1%), and "At work I experienced a sense of control over what I was doing*," (5.1%). For the Flow Scale, missing data due to item non-response was greater than 5.0% for the following items: "*I felt that my work progressed smoothly*" (5.1%) and "*At work I was unaware of who I was*" (5.1%). For the Self-deceptive Positivity and Impression Management scales, missing data due to item non-response did not exceed 5.0%.

When multiple items scales are used in research, missing data can be present at the item level or scale level (Roth, Switzer III, & Switzer, 1999). Best practices for missing data management suggest that individual items missing on multiple item scales should be imputed and scores calculated prior to the imputation at the scale/analysis level (Schlomer et al., 2010). This imputation at the item level is performed to preserve and maximise the use of information collected by not ignoring items responded to and using item-level data to estimate missing scores (Roth et al., 1999).

To assess if patterns were present among missing data at the item level, SPSS missing values analysis was used to detect if data were MCAR. As recommended by B.G. Tabachnick (personal communication, August, 8, 2011), for determining MCAR for grouped data, the grouping variable (i.e., low-flow versus high-flow) was dummy coded and included in Little's MCAR test. Using Little's test (Little, 1988) it was revealed that the data at the item level were MCAR (χ^2 = 9579.91, *df* = 9498, *p* = .275). Missing items due to item non-response were, therefore, imputed using the *person mean substitution (PMS)* approach (Downey & King, 1998). The person mean substitution approach involves replacing missing items of a subscale or scale with the participant's mean response for items responded to. The proportion of missing items due to item non-response that were imputed for the Conditions to Flow Scale, Flow Scale, Self-Deceptive Positivity, and Impression Management scales was 1.53%, 1.53%, 0.72%, and 0.69%, respectively.

At the scale/subscale level, SPSS missing values analysis revealed that the data were MCAR (χ^2 = 121.08, *df* = 153, *p* = .973) and therefore it was seen as acceptable to perform a casewise/listwise deletion for missing data at the scale level. This deletion still resulted in an acceptable sample size for intended analyses (low-flow group *n* = 83 and high-flow group *n* = 113).

To assess normality, an inspection of histograms with super imposed normal distributions, expected normal probability plots, and detrended expected normal probability plots revealed that no variables had excessive departure from normality. No potential univariate outliers were identified ($z > 3.29$). For the two dependent variables in the MANOVA (i.e., Conditions to Flow Scale score and Flow Scale score), one case was identified as a multivariate outlier by Mahalanobis distance (critical value: χ^2 (2) = 13.82, $p < .001$). However, it was decided to retain this case given it was not a substantial outlier (Mahalanobis distance score = 14.08) and MANOVA is robust to a few outliers, particularly when they are not a substantial outlier (Pallant, 2011).

Linearity was confirmed by inspecting a matrix of scatter plots between the conditions to flow and flow scores, for each group (i.e., low and high-flow group). The assumption of homogeneity of variance-covariance matrices was tested using Box's M test which revealed a non-significant result, providing evidence that this assumption was not violated.

7.3.3.1 Known group validity.

Prior to testing the known group validity hypotheses of the present study, means, standard deviations, and Cronbach's alpha coefficients were examined for the Conditions to Flow and Flow Scales.

Table 7.2

Means, Standard Deviations and Cronbach's alpha Coefficients for Grouped Data for the Conditions to Flow and Flow Scales

	Low-flow group (n = 83)		High-flow group (n = 113)	
	M (SD)	α	M (SD)	α
CDN	13.71 (3.30)	.94	15.00 (2.70)	.93
FLW	14.92 (3.75)	.89	15.97 (3.23)	.87

Note. CDN = Conditions to Flow; FLW = Flow.

It can be seen from Table 7.2 that, the high-flow group had average scores that were higher than the low-flow group for both the Conditions to Flow and Flow Scales. It can also be seen from Table 7.2 that, both scales had Cronbach's alpha coefficients greater than the recommended minimum .60 cut-off criterion (DeVellis, 2003).

To test the present study's hypothesis that the high-flow group would score higher than the low-flow group on both the Conditions to Flow and Flow Scales, a MANOVA was performed. Results revealed a statistically significant difference between high and low-flow groups on the combined conditions to flow and flow scores (F(2, 193) = 4.92, p = .008; Wilks' Lambda = .95). The degree of difference was small to moderate (η^2 = .048). For the Conditions to Flow Scale, the difference between mean scores on the high-flow group (M = 15.00, SD = 2.70) and low-flow group (M = 13.71, SD = 3.30) was statistically significant (F(1, 194) = 8.99, p = .003; equal variances assumed). The degree of difference between the means (mean difference = -1.29, 95% CI [-2.14, -0.45]) was small to moderate (η^2 = .045). For the Flow Scale, the difference between mean scores on the high-flow group (M = 15.97, SD = 3.23) and low-flow group (M = 14.92, SD = 3.75) was also found to be statistically significant (F(1, 194) = 4.366, p = .038; equal variances assumed). The degree of difference between the means (mean difference = -1.05, 95% CI [-2.03, -0.06]) was small to moderate (η^2 = .022).

7.3.3.2 Discriminant validity.

Table 7.3 shows the Pearson's product-moment correlations (both attenuated and disattenuated) of the Conditions to Flow and Flow Scales with Social Desirable Responding Scale (including Self-Deceptive Positivity and Impression Management subscales).

Table 7.3

Attenuated and Disattenuated Pearson's Product-Moment Correlations of the Conditions to Flow and Flow Scales With Social Desirable Responding, Self-Deceptive Positivity, and Impression Management (N = 167)

	CDN	FLW
Attenuated		
SDP	**.33**	**.26**
IM	**.23**	.11
SDR	**.33**	**.23**
Disattenuated		
SDP	.42	.34
IM	.27	.13
SDR	.38	.28

Note. Statistically significant correlations at $p < .05$ (2 tailed) are shown in boldface (for attenuated correlations only as disattenuated cannot be tested for significance). CDN = Conditions to Flow; FLW = Flow; SDP = Self-Deceptive Positivity; IM = Impression Management; SDR = Social Desirable Responding.

As can be seen in Table 7.3, small to medium positive correlations were found between the Conditions to Flow Scale, Flow Scale and Self Deceptive Positivity, Impression Management, and Social Desirable Responding. The strongest correlation found among both the attenuated and disattenuated correlations was between the Conditions to Flow Scale and the Self-Deceptive Positivity subscale. This suggests that, the percentage of common variance shared with either the Conditions to Flow Scale, the Flow Scale and Social Desirable Responding was not substantially large (17.6%).

7.3.4 Study 3 discussion.

The aims of Study 3 were to examine the validity of the Conditions to Flow and Flow Scales. More specifically, to provide evidence of known group validity and discriminant validity, Study 3 aimed to demonstrate differences between known occupation groups for both scales and show that (using disattenuated correlations) there were no large associations between both the developed scales and social desirable responding.

The hypotheses of Study 3 were supported; (a) participants in the high-flow group (managers, surgeons, and teachers) scored statistically significantly higher on both the Conditions to Flow and Flow Scales than the low-flow group (clerical workers), and (b) neither the Conditions to Flow Scale nor the Flow Scale were largely associated (i.e., $r \geq .50$) with Social Desirable Responding (including Self Deceptive Positivity and Impression Management).

7.3.4.1 Known group validity.

The statistically significant difference between the low and high-flow groups both on the Conditions to Flow Scale and Flow Scale provide evidence of known group validity. Group differences found in the present study for the Flow Scale are consistent with the findings from previous studies that examined flow experiences among occupations (Csikszentmihalyi, 1975, 2002; LeFevre, 1988; Morgan, 2005). Group differences found in the present study for the Conditions to Flow Scale are also in line with suggestions that low-skilled occupations are likely to experience less of the conditions to flow than high-skilled occupations (LeFevre, 1988; Morgan, 2005). Finding only a small to moderate difference between groups for the Conditions to Flow Scale, although sufficient for providing evidence of validity, may be due to those in the low-flow group occasionally experiencing high levels of certain conditions to flow and those in the high-flow group occasionally not experiencing high levels of certain conditions to flow. For instance, it is reasonable to expect that both knowing how well one is performing (i.e., feedback) and feeling in control, could also be experienced in low-skilled or non-challenging occupations (i.e., non-flow experiences). However, what may be lacking in the low-flow group are the other known conditions to flow (i.e., appropriate challenge and clear goals), which when combined with feedback and control, likely result in more flow experiences.

Finding only a small to moderate difference between groups for the Flow Scale, although again sufficient for providing evidence of validity, may be due to employees in the low-flow group experiencing flow some of the time at work or it may be that employees in the high-flow group do not experience flow at work as frequently as expected. For employees in the low-flow group, it is reasonable to expect that they may find some aspects of their work conducive to flow (e.g., completing a particular task by a deadline that was considered to be just manageable). Conversely, for employees in the high-flow group, it is reasonable to expect that there may be some aspects of their work that are not conducive to flow (e.g., dealing with an impossible deadline).

The lack of a significant association between autotelic personality and the Flow Scale may suggest that the Flow Scale is not valid. However, another explanation as to why no significant associations were found could be due to the operationalisation of autotelic personality. Csikszentmihalyi and colleague’s (1993) operationalisation of an autotelic personality, was derived from its ability to distinguish between average performing and talented teenagers. However, there is no evidence that this operationalisation explains an ability to experience flow more often and in less autotelic activities (i.e., autotelic personality). Therefore, there are concerns about the validity of the operationalisation and measurement of autotelic personality used in the current study. Similarly, Baumann (2012) recently stated that despite Csikszentmihalyi's (1975) conceptualisation of an autotelic personality, it has not been adequately operationalised and as such it remains difficult to measure. Another explanation as to why there was no substantial association between autotelic personality and the Flow Scale, is that research suggests that personality factors have little influence on the experience of flow and that the situational characteristics of the task/activity are largely responsible for the flow experience (Fullagar & Kelloway, 2009). Combined, these two factors may explain the insignificant associations found between autotelic personality and flow.

One possible limitation of the current study is that occupations were classified into occupational groups. As mentioned previously, the classification of the ANZSCO is determined by occupational skill level, where occupations with similar skill levels are grouped together (Trewin & Pink, 2006). Using this classification, it was expected that occupations with a similar skill level would be grouped together. However, it is possible that occupational skill level within the occupational groups may differ to some degree, which would consequently affect the frequency with which flow was experienced. For example, in the low-flow group, receptionist work may require fewer skills than secretarial work and consequently, more flow may be experienced in secretarial work. A second limitation is the criterion used to classify participants into either a low or high-flow group. The criterion used for the classification was occupational skill level, as previous research has found that there were group differences in the amount of flow experienced between low and high-skilled occupations. It was suggested that group differences were due to the low-skilled occupations having few of the conditions to flow and the high-skilled occupations having many (LeFevre, 1988; Morgan, 2005). However, occupational skill level alone may not necessarily indicate the presence or absence of the conditions to flow. For example, it is reasonable to expect that an employee who possesses low skills may find a low-skill occupation appropriately challenging. Although significant differences were revealed between occupational groups (high-flow vs. low-flow), larger effect sizes may have been found if comparisons were made between specific occupations that are known to differ in the occurrence of the conditions to flow. A third limitation is that the recruited sample was predominantly female. However, the experience of flow is not considered to be gender specific (Nakamura & Csikszentmihalyi, 2002) and therefore it is likely that the current study's findings are not limited to female populations.

7.3.4.2 Discriminant validity.

The finding that neither the Conditions to Flow Scale nor the Flow Scale were largely associated with Social Desirable Responding (including Self Deceptive Positivity and Impression Management) suggests that the measurement of both the Conditions to Flow and Flow are not likely influenced by one's need to portray oneself in a more positive way as determined by society. The small to medium correlations found may be explained by common method variance – variance attributable to the measurement method (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Cote and Buckley (1987) in a review of 70 multitrait-multimethod studies found that common method variance can range from 15.8% to 40.7%. In the present study it was revealed that the amount of covariation between variables was no more than 17.6%, which is not above and beyond what could be attributed to common method variance.

As there were no large associations found, the current study provides evidence of discriminant validity for both developed scales. Ruling out the possible influence of social desirable responding helps to ensure that responses are a more accurate representation of the underlying phenomenon of interest, a particularly important validation step for self-reporting instruments (DeVellis, 2003).

7.4 Participant Details, Data Collection Procedures, and Data Screening for Study 4, 5, and 6

As study 4, 5, and 6 all share the same dataset, the participant details, data collection procedures, and overall screening are presented here. Assumption testing that is specific to each study's analysis is presented within each study.

7.4.1. Data collection procedures.

This study received full ethics approval from Australian Catholic University Human Research Ethics Committee (HREC); study HREC approval register No. V2010 91 (see Appendix A-22). Participant recruitment sources were the same as detailed in Study 3 (see section 7.3.2.3, page 135). In addition, organisations were also approached to see if their employees would like to voluntarily participate. Organisations that agreed to participate received a brief report that included aggregated data only (see appendices A-23 and A-24 for reports provided to the two organisations that agreed to participate). Procedures for participation were the same as detailed in Study 3 (see section 7.3.2.3, page 135).However, the occupation filter was removed. See Appendix A-25 for a copy of the participant information sheet for the collection of data for this dataset.

7.4.2 Participants.

A convenience sample of 590 participants was recruited. The sample was made up of 196 (33.2%) males and 392 (66.4%) females; two (0.3%) participants did not respond to this question. The mean age was 39.48 years (*SD* = 11.24; 18 - 66 years). In terms of level of education, 18 (3.1%) indicated that they did not finish school, 27 (4.6%) indicated they had completed an apprenticeship, 95 (16.1%) indicated they had finished high school, and 447 (75.7%) indicated they had completed a degree or higher degree; 3 (0.5%) did not specify their level of education. In terms of annual income, 101 participants (17.1%), 267 (45.3%), and 166 (28.1%) indicated an annual income of up to $40,000, $40,001 – $80,000, and greater than $80,001, respectively; 46 (7.8%) did not wish to divulge their annual income and 10 (1.7%) did not respond to the question. In terms of occupation, 11 (1.9%) were categorised as Labourers, 1 (0.2%) Machinery Operator and Driver, 11 (1.9%) Sales Workers, 182 (30.8%) Clerical and Administrative Workers, 35 (5.9%) Community and Personal Service Workers, 28 (4.7%) Technicians and Trades Workers, 222 (37.6%) Professionals, and 60 (10.2%) Managers; 40 (6.8%) did not indicate their occupation. The mean weekly hours worked was 38.20 (*SD* = 10.99; 5 - 80 hours) and the mean job tenure was 5.58 years (*SD* = 6.34; 1 - 37 years).

7.4.3 Overall data screening.

7.4.3.1 Item level data screening.

At the item level, participant attrition (participants who responded to at least one question but responded to less than 60% of items for a scale) accounted for 41.2% of the sample and missing data due to item non-response ranged from 0% to a high of only 10.2% for items that constitute the scales. For the Conditions to Flow Scale, missing data due to item non-response was greater than 5.0% for the following items: "*At work I clearly knew if I was performing well"* (9.5%), *"At work I constantly knew if I was performing well"* (9.1%), and, *"At work I experienced a sense of control over what I was doing"* (9.7%). For the Flow Scale missing data due to item non-response was greater than 5.0% for the following items: *"I felt that my work progressed smoothly*" (10.2%), "*At work I forgot about the problems that were in my life*" (9.3%), and, "*At work I was unaware of who I was*" (8.8%). There were no items with missing data due to item non-response greater than 5.0% for the Utrecht Work Engagement Scale (UWES-9), DASS 21 (Depression Scale), Emotional Well-Being Scale, Scales of Psychological Well-Being, Social Well-Being Scales, World Health Organisation's Health and Work Performance Questionnaire, and the turnover intentions scale.

Using SPSS missing value analysis, Little's test (Little, 1988) revealed that the data at the item level were MCAR (χ^2 = 42847.81, *df* = 42709, *p* = .317) and therefore the PMS approach was used to impute values for cases where missing data were due to item non-response. The proportion of missing items imputed due to item non-response for the scales used in Study 4, 5, and 6 are presented in Table 7.4.

Table 7.4

Proportion of missing items imputed due to item non-response for the Conditions to Flow Scale, Flow Scale, UWES-9, DASS 21 (Depression Scale), Emotional Well-Being Scale, Scales of Psychological Well-Being, Social Well-Being Scales, World Health Organisation's Health and Work Performance Questionnaire, and the turnover intentions scale

	Percent missing
Conditions to Flow Scale[a b c]	2.12
Flow Scale[a b c]	2.55
UWES-9[a]	0.19
DASS 21 (Depression Scale)[c]	0.88
Emotional Well-Being Scale [c]	0.59
Scales of Psychological Well-Being [c]	
Self Acceptance [c]	1.26
Positive Relations with Others [c]	0.70
Autonomy [c]	0.81
Environmental Mastery [c]	1.40
Purpose in Life [c]	0.85
Personal Growth [c]	1.36
Social Well-Being Scales [c]	
Social Integration [c]	0.37
Social Acceptance [c]	0.46
Social Contribution [c]	0.28
Social Actualisation [c]	0.28
Social Coherence [c]	0.09
World Health Organisation's Health and Work Performance Questionnaire	0.48
Turnover Intentions Scale [c]	0.52

Note. [a] scales used in Study 4, [b] scales used in Study 5, [c] scales used in Study 6.

Data were screened for out of range values and normality. Curran, West, and Finch (1996) recommend that data with skewness values 2 or above and kurtosis values 7 or above become problematic for CFA when using ML estimation. All items in scales used in item level analysis (i.e., scales used in Study 5) were found to have skewness and kurtosis values within the above specified cut-off criteria. Potential univariate outliers ($z > 3.29$), seen as a legitimate part of the population, were retained and adjusted using the formula $x = 3.29 \times SD \pm \bar{x}$ (Field, 2005).

7.4.3.2 Scale level data screening.

At the variable level of analysis (i.e., subscale/scale level), using SPSS missing value analysis, Little's test (Little, 1988) revealed that the data were not MCAR ($\chi^2 = 2239.549$, $df = 1717$, $p < .001$). MI methods are considered appropriate for data that is not MCAR (Schafer & Graham, 2002; Schlomer et al., 2010; Tabachnick & Fidell, 2007) and, therefore, MI was performed to impute missing values for the Conditions to Flow Scale, Flow Scale, UWES-9, DASS 21 (Depression Scale), Emotional Well-Being Scale, Scales of Psychological Well-Being, Social Well-Being Scales, World Health Organisation's Health and Work Performance Questionnaire, and turnover intentions scale.

Prior to MI, the data were screened for out of range values and normality. It was revealed that skewness and kurtosis values were below the above specified cut-off criteria (skewness <2 and kurtosis <7) as suggested by Curran, West, and Finch (1996), indicating that the data did not substantially deviate from normality. Additionally, as outliers can excessively influence the imputation of missing values (Quintano et al., 2010), prior to MI, potential univariate outliers ($z > 3.29$) were retained and adjusted using the formula $x = (3 \times SD) \pm \bar{x}$ (Field, 2005).

MI was performed as described in SPSS Inc. (2007). To ensure that no out of range values were imputed for each scale, the imputation of values was constrained to the possible scoring range of each scale.

7.5 Study 4: Convergent Validity

7.5.1 Overview.

The present study reports on the convergent validity of the Flow Scale by assessing its association with the concept of employee engagement. It was hypothesised that there would be a large association between the Flow Scale and employee engagement. However, despite having overlapping variance, the two concepts were expected to be distinct.

7.5.2 Method.

7.5.2.1 Participants.

The sample was a convenience sample of 590 participants. Additional details of the sample used in this study are presented in section 7.4.2, page 144.

7.5.2.2 Measures.

Demographics: A small set of demographic questions was asked that provided information about participants' age, gender, education, occupation, average weekly hours of employment, job tenure, and income (see Appendix A-10 for questions).

Flow Scale: Refer to Study 3 of this chapter for further information about this scale. In the present study, Cronbach's alpha coefficients for the Flow Scale and Deep Concentration, Loss of Self-Consciousness, Order in Consciousness, Merging of Action and Awareness, and Transformation of time subscales were: .91, .87, .87, .91, .70, and .82, respectively (see Appendix A-18 for scale).

Employee Engagement: The nine item Utrecht Work Engagement Scale (UWES-9) consists of three subscales: Vigour (e.g. "*At my work I am bursting with energy*"), Dedication (e.g. "*I am enthusiastic about my job*"), and Absorption (e.g. "*When I am working, I forget everything else around me*"). Respondents rate each statement on a 7-point frequency rating scale from 0 = *never* to 6 = *always*. The previously reported overall internal consistency (Cronbach's alpha coefficient) was .92 (Schaufeli, Bakker, & Salanova, 2006). The obtained Cronbach's alpha coefficient in the present study was .94 (see Appendix A-26 for scale).

7.5.2.3 Procedure.

As this study used the same dataset as Study 5 and 6, see section 7.4.1, page 143, for the procedure.

7.5.2.4 Data analysis.

Pearson's product-moment correlations were used to examine possible associations (if any) between the Flow Scale and the UWES-9. Correlations were also disattenuated to account for imperfect reliability. Correlations were interpreted using guidelines by Cohen (1988), where correlations between: .10 to .29, .30 to .49, and .50 to 1.0 represent small, medium, and large correlations, respectively.

7.5.3 Results.

Prior to analysis, data were screened for normality and linearity. Screening for out of range values, potential outliers, and missing data, and the handling of data imputation were previously dealt with and are described in section 7.4.3.2, page 146.

To assess normality, an inspection of histograms with super imposed normal distributions, expected normal probability plots, and detrended expected normal probability plots revealed that no variables had departure from normality. A scatter plot of each flow subscale with the UWES-9 and scatter plot of Flow Scale with the UWES-9 confirmed that the assumption of linearity was not violated. Table 7.5 shows the Pearson's product-moment correlations (both attenuated and disattenuated) of the UWES-9 (employee engagement) with the flow subscales and Flow Scale.

Table 7.5

Attenuated and Disattenuated Pearson's Product-Moment Correlations of the UWES-9 With the Flow Subscales and Flow Scale (N = 590)

	CON	LOS	ORD	MAA	TOT	FLW
Attenuated						
UWES-9	**.42**	**.11**	**.52**	**.52**	**.57**	**.54**
Disattenuated						
UWES-9	.47	.12	.56	.64	.65	.59

Note. Statistically significant correlations at $p < .05$ (2 tailed) are shown in boldface (for attenuated correlations only as disattenuated cannot be tested for significance). CON = Deep Concentration; LOS = Loss of Self-Consciousness; ORD = Order in Consciousness; MAA = Merging of Action and Awareness; TOT = Transformation of Time; FLW = Flow; UWES-9 = Utrecht Work Engagement Scale.

As shown in Table 7.5, it was found that the UWES-9 had large positive correlations with the Order in Consciousness, Merging of Action and Awareness, and Transformation of Time subscales; a medium positive correlation with the Deep Concentration subscale; and a small positive correlation with the Loss of Self-Consciousness subscale. A large positive correlation was found between the UWES-9 and Flow Scale, indicating that 29.2% of the variance was shared between these two variables.

7.5.4 Study 4 discussion.

Study 4 aimed to show that there was a large association between the Flow Scale and employee engagement. Results provided support for the hypothesis of Study 4; the Flow Scale was found to have a large association with employee engagement, which provides evidence of convergent validity and is consistent with previous research that has found a relationship between flow and engagement (Rupayana, 2008). It was also revealed that 29.2% of the variance was shared between these two constructs, indicating that although there was some overlap, flow and employee engagement are likely two distinct constructs. Large associations were also found between employee engagement and three of the flow subscales: Order in Consciousness, Merging of Action and Awareness, and Transformation of Time, and a medium association was found between employee engagement and the Deep Concentration subscale, further highlighting the similarities between flow and employee engagement. However, only a small association between employee engagement and the Loss of Self-Consciousness subscale was found, which provides evidence to suggest that although flow and employee engagement constructs overlap, they are two distinct constructs. This possible distinction between flow and employee engagement is consistent with the theoretical arguments made in Chapter 4, in that the flow experience is a pure autonomous peak form of motivation and absorption in a particular task, whereas employee engagement refers more broadly to a high level of engagement and persistent involvement with one's work. Simply being engaged at work may not be enough for an employee to lose awareness of one's self (something that we are often constantly preoccupied with). However, when in a flow state, a more intense motivational state, it is often quite possible to lose awareness of one's self.

7.6 Study 5: Factorial Validity

7.6.1 Overview.

The present study aimed to confirm the previously found factor structures (refer to Chapter 6) of both the Conditions to Flow and Flow Scales. It was hypothesised that:

(a) The Conditions to Flow Scale would be best represented by four first-order factors (Appropriate Challenge, Clear Goals, Control, and Feedback), and one single global factor.

(b) The Flow Scale would be best represented by five first-order factors (Order in Consciousness, Loss of Self-Consciousness, Transformation of Time, Deep Concentration, and Merging of Action and Awareness), and one single global factor.

7.6.2 Method.

7.6.2.1 Participants.

The sample was a convenience sample of 590 participants. Additional details of the sample used in this study are presented in section 7.4.2, page 144.

7.6.2.2 *Measures.*

Conditions to Flow Scale: Refer to Study 3 of this chapter for further information about this scale. In the present study, Cronbach's alpha coefficients for the Conditions to Flow Scale and

Appropriate Challenge, Clear Goals, Control, and Feedback subscales were: .94, .95, .85, .93, and .95, respectively (see Appendix A-18 for the scale).

Flow Scale: Refer to Study 3 of this chapter for further information about this scale. In the present study, Cronbach's alpha coefficients for the Flow Scale and Deep Concentration, Loss of Self-Consciousness, Order in Consciousness, Merging of Action and Awareness, and Transformation of time subscales were: .92, .88, .90, .92, .71, and .83, respectively (see Appendix A-18 for the scale).

7.6.2.3 Procedure.

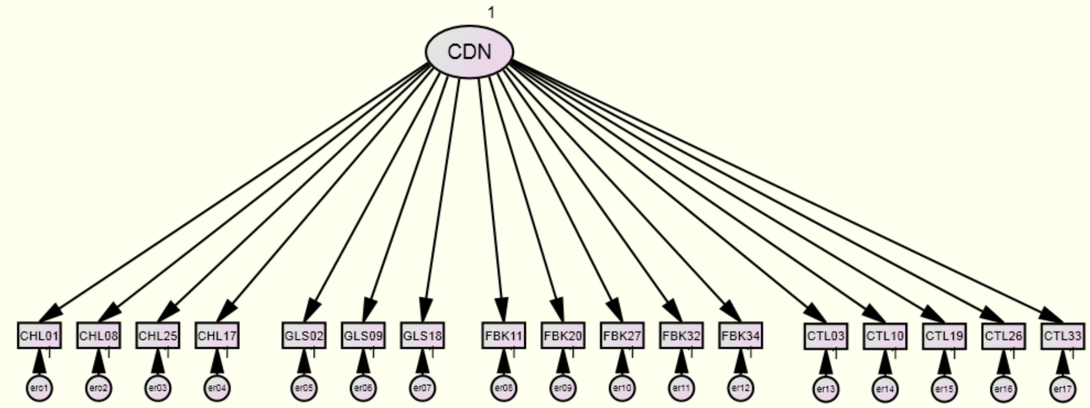
As this study used the same dataset as Study 4 and 6, details of the procedure can be found in section 7.4.1, page 143.

7.6.2.4 Data analysis.

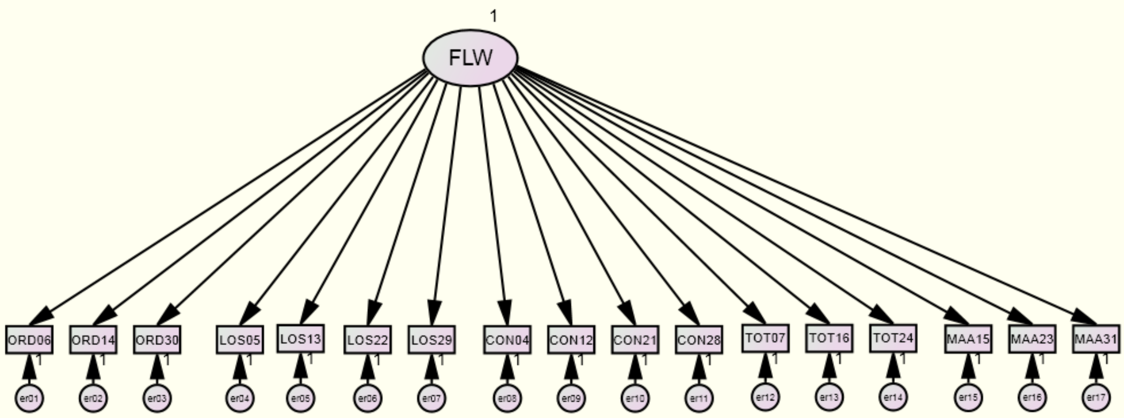
Confirmatory Factor Analyses (CFAs) were used to confirm the previously found factor structures (see Chapter 6) of both the Conditions to Flow and Flow Scales. To confirm the factor structures of both the Conditions to Flow and Flow Scales, for each scale, three increasingly more complex models were tested to assess model fit. The first model tested was a general unrestricted single global factor model (see Figure 7.1, Model 1a for the conditions to flow model and Model 1b for the flow model). This first model was identified by constraining the single global factor variable variance to 1.0. The second more complex model tested was a restricted factor model. For the conditions to flow model (Figure 7.1, Model 2a), four first-order factors were specified (Appropriate Challenge, Clear Goals, Control, and Feedback). For the flow model (Figure 7.1, Model 2b), five first-order factors were specified (Deep Concentration, Loss of Self-Consciousness, Order in Consciousness, Merging of Action and Awareness, and Transformation of Time). A restricted model was chosen over the more commonly used oblique factor model, as it allows one to interpret the influence of the intended latent variable independently of the covariances between other latent variables (Gignac, 2007). The second model was identified by constraining all latent first-order factor variable variances to 1.0. The last model tested was a nested factor model, where a nested first-order global factor was specified in addition to the restricted first-order factors that were specified in the second model (four for the conditions to flow and five for the flow model). These models are shown in Figure 7.1 (Model 3a corresponds to the conditions to flow model and Model 3b to the flow model). A nested model was chosen over the more commonly used higher-order model, as it allows for statistical significance testing of all parameters estimated and does not assume full mediation between higher-order factor(s) and observed indicator variables, which is often an unrealistic assumption (Gignac, 2007). This third model was identified by constraining all latent first-order factor variable variances to 1.0.

All CFA analyses were based on Pearson covariance matrices using the maximum likelihood (ML) estimation method and were performed using AMOS 18.0 graphics. To assess overall model fit, R. B. Kline's (2011) recommendations were adopted whereby model fit was assessed using a combination approach of the chi-square test, absolute close fit indices: root mean-square error of approximation (RMSEA; Steiger & Lind as cited in Worthington & Whittaker, 2006) and standardised root mean square residual (SRMR; Bentler, 1995), and incremental fit index: comparative fit index (CFI; Bentler, 1990).

Models were seen as good fitting when the absolute close fit indices: RMSEA and SRMR were less than or equal to .06 and .08, respectively, and the incremental fit index (CFI) was greater than .95 (Hu & Bentler, 1999). To avoid over reliance on global fit indices, an examination of standardised residual matrices was used to determine if specific variables or relations have been accounted for (Bollen, 1989; Hayduk, 1987), and also parameter estimates were used to assess the appropriateness of signs and magnitudes (D. L. Jackson, Gillaspy, & Purc-Stephenson, 2009). As non-nested comparisons were made (i.e., all models for comparison did not contain a subset of another model) the Bayesian information criteria (BIC: Rafferty, 1993; Schwarz, 1978) was used. When comparing models using the BIC index, a difference of 10 or more provides strong support for selecting the model with the smaller BIC value (Rafferty, 1995; Springer & Hauser, 2006).

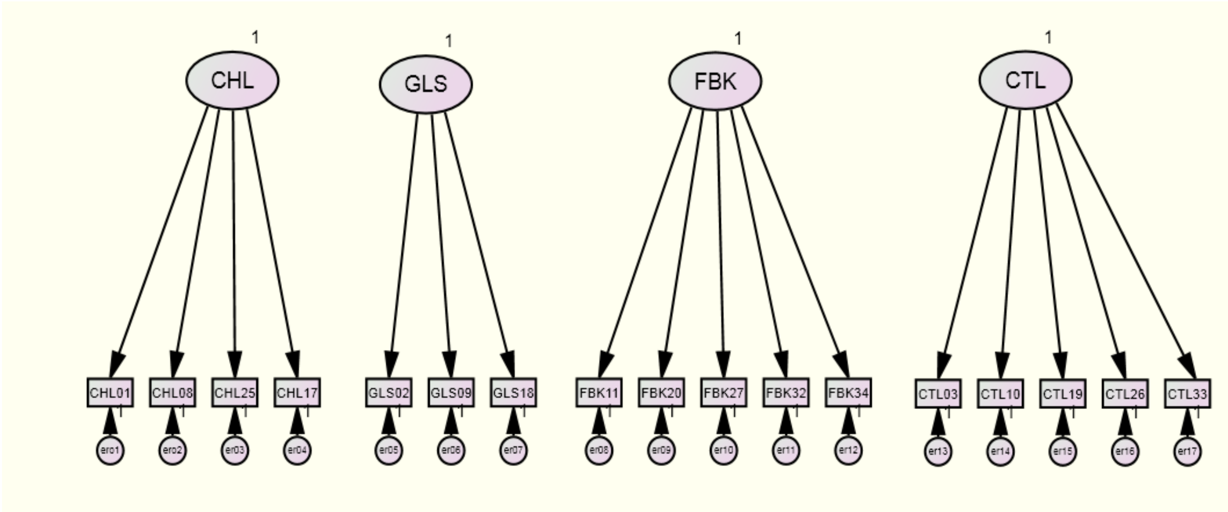


Model 1a: Unrestricted single global factor model - Condtions to Flow Scale

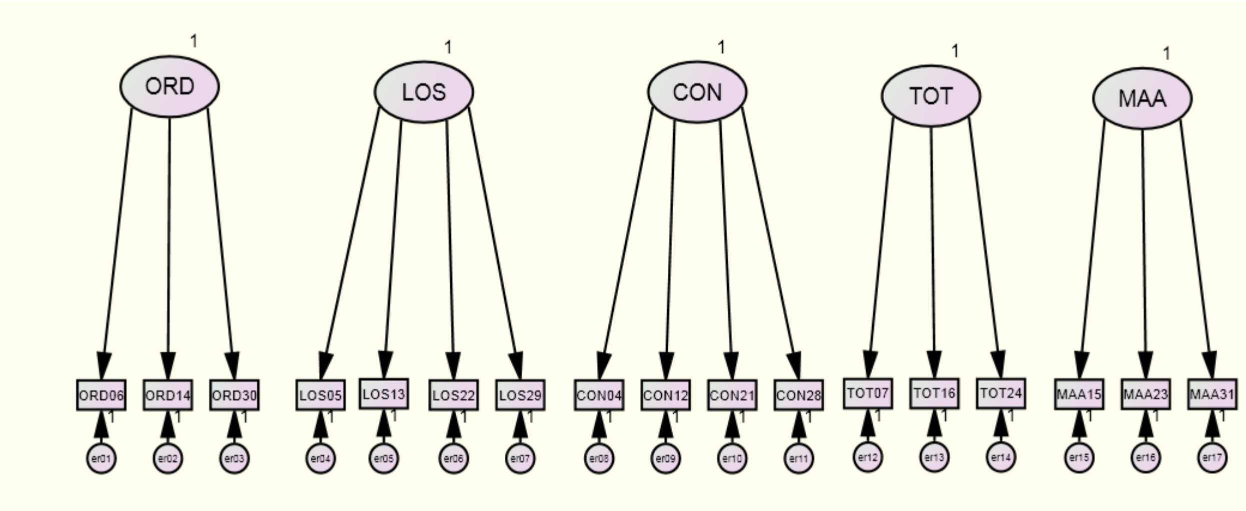


Model 1b: Unrestricted single global factor model - Flow Scale

Figure 7.1. Competing models tested for both the Conditions to Flow and Flow Scales. Indicator variables were labelled using the subscale name and item number in scale (refer to Appendix A-18). CDN = Conditions to Flow; FLW = Flow; CHL = Appropriate Challenge; GLS = Clear Goals; FBK = Feedback; CTL = Control; ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness.

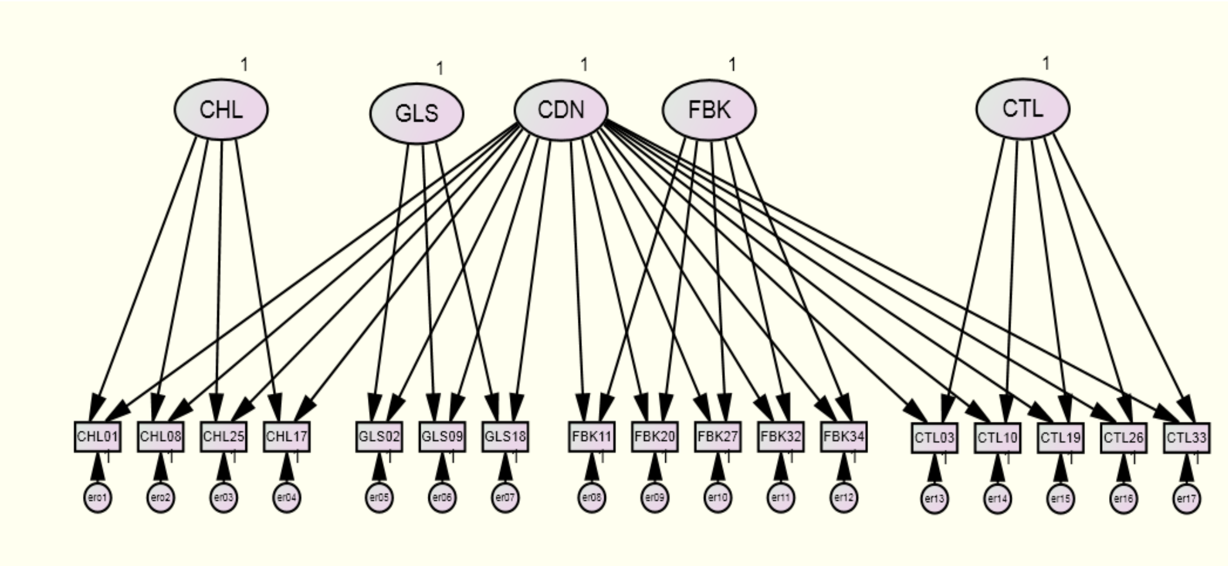


Model 2a: Restricted four factor model - Condtions to Flow Scale

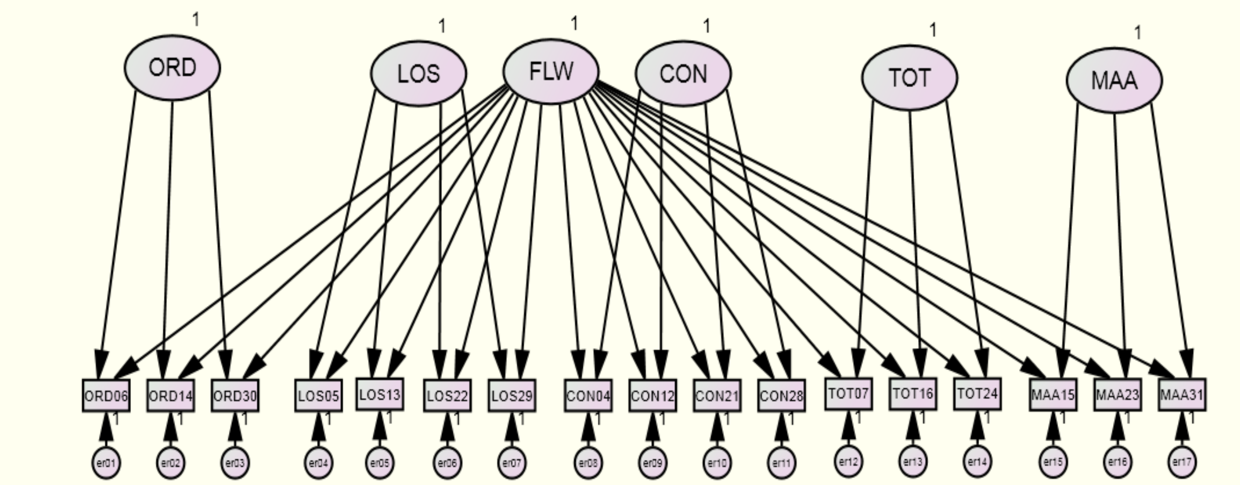


Model 2b: Restricted five factor model - Flow Scale

Figure 7.1. Continued.



Model 3a: Nested model - Conditions to Flow Scale



Model 3b: Nested model - Flow Scale

Figure 7.1 Continued.

7.6.3 Results.

7.6.3.1 Data screening.

Prior to analysis, data were screened for multivariate outliers, linearity, multicollinearity, and singularity. Screening for out of range values, normality, potential univariate outliers, and missing data, and the handling of data imputation were previously dealt with and are described in section 7.4.3.1, page 144.Multivariate outliers for both the conditions to flow and flow items were identified through Mahalanobis distance critical values and subsequently removed. For the conditions to flow items, 25 cases (χ^2 (17) = 40.790, p < .001) were removed and 24 cases for the flow items (χ^2 (17) = 40.790, p < .001).

For both the conditions to flow and flow items, scatter plots of items considered to be among the worst (i.e., the most highly skewed and the most negatively skewed) confirmed that the assumption of linearity was not violated. For the conditions to flow items and flow items, collinearity statistics revealed no evidence of multicollinearity (i.e., no bivariate correlations between items that were .90 or above; Tabachnick & Fidell, 2007) or singularity.

7.6.3.2 CFA conditions to flow scale.

To test the present study's first hypothesis, a series of more complex models was tested to assess the factor structure of the Conditions to Flow Scale. The first model tested (see Figure 7.1, Model 1a) revealed a χ^2 (119) = 2981.71, p < .001 and fit indices indicative of a poor fitting model: RMSEA = .240 (90% CI [.232, .247]), SRMR = .154, and CFI = .602 (refer to Table 7.6). A BIC score of 3187.00 was obtained for Model 1a.

Chi square and fit indices for the second model tested (see Figure 7.1, Model 2a) were also indicative of a poor fitting model: RMSEA = .135 (90% CI [.128, .143]), SRMR = .373, and CFI = .873 (refer to Table 7.6). A BIC score of 1234.71 was obtained for Model 2a, indicating a substantial improvement over Model 1a.

The third and final model tested was a nested factor model (see Figure 7.1, Model 3a). Results from CFA analyses for Model 3a revealed a χ^2 (102) = 262.85, p < .001 and absolute close fit indices indicative of an adequately well fitting model: RMSEA = .061 (90% CI [.052, .071]) and SRMR = .039. The incremental fit index was also indicative of a good fitting model: CFI = .978 (refer to Table 7.6). As can be seen in Table 7.7 and Figure 7.2, all factor loadings were positive and statistically significant at the p < .001 level, ranging from .33 (Item GLS09) to .82 (Item CTL33). A BIC score of 570.78 was obtained for Model 3a, indicating superior fit over Models 1a and 2a. An inspection of the standardised residual covariance matrix indicated that only 2.0% of the elements were associated with values larger than 2.58, further confirming acceptable model fit.

Table 7.6

CFA of Three Competing Models of the Conditions to Flow Scale (N = 419)

	χ^2	*df*	*p*	RMSEA	SRMR	CFI	BIC
Model 0a	7325.69	136	< .001	.356 (90% CI [.349, .363])	.504	.000	7428.34
Model 1a	2981.71	119	< .001	.240 (90% CI [.232, .247])	.154	.602	3187.00
Model 2a	1629.42	119	< .001	.135 (90% CI [.128, .143])	.373	.873	1234.71
Model 3a	262.85	102	< .001	.061 (90% CI [.052, .071])	.039	.978	570.78

Note. Model 0a = Null Model; Model 1a = Unrestricted; Model 2a = Restricted Four Factor; Model 3a = Nested Model – restricted four factor with a nested global factor; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual; CFI = comparative fit index; BIC = Bayesian information criterion.

Table 7.7

Completely Standardised Factor Solutions of the Comparative Conditions to Flow Scale Models: Unrestricted Model (Model 1a), Four Factor Restricted Model (Model 2a), and Nested Global and Restricted Four Factor Model (Model 3a; N = 419)

	Model 1a	Model 2a				Model 3a				
Item	Global	CHL	GLS	FBK	CTL	Global	CHL	GLS	FBK	CTL
CHL01	.36	.88				.37	.81			
CHL08	.43	.92				.45	.80			
CHL25	.49	.93				.51	.78			
CHL17	.45	.93				.47	.80			
GLS02	.47		.73			.47		.66		
GLS09	.77		.82			.81		.33		
GLS18	.68		.89			.70		.48		
FBK11	.85			.88		.77			.42	
FBK20	.88			.89		.81			.38	
FBK27	.86			.90		.76			.47	
FBK32	.88			.93		.77			.52	
FBK34	.88			.93		.78			.52	
CTL03	.64				.74	.62				.42
CTL10	.70				.85	.68				.51
CTL19	.73				.87	.73				.46
CTL26	.76				.88	.74				.47
CTL33	.82				.92	.82				.43

Note. All factor loadings achieved statistical significance at $p < .001$. CHL = Appropriate Challenge; GLS = Clear Goals; FBK = Feedback; CTL = Control; Model 1a = Unrestricted; Model 2a = Restricted Four Factor; Model 3a = Nested Model – restricted four factor with a nested global factor.

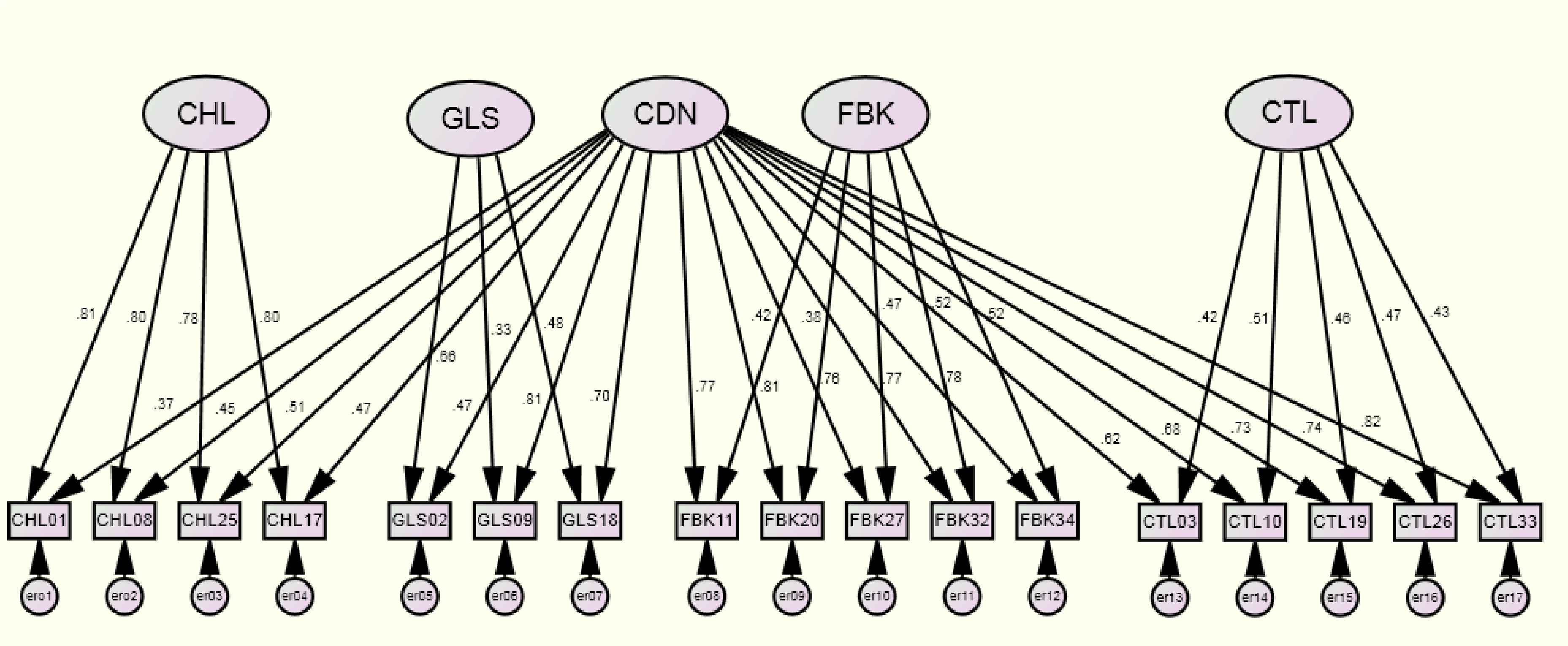


Figure 7.2. Nested model – Conditions to Flow Scale. All factor loadings were positive and statistically significant at the *p* < .001 level. Indicator variables were labelled using the subscale name and item number in scale (refer to Appendix A-18). CHL = Appropriate Challenge; GLS = Clear Goals; FBK = Feedback; CTL = Control; CDN = Conditions to Flow.

7.6.3.3 CFA flow scale.

To test the present study's second hypothesis, a series of more complex models was also tested to assess the factor structure of the Flow Scale. The first model tested (see Figure 7.1, Model 1b) revealed a χ^2 (119) = 2624.15, $p < .001$ and fit indices indicative of a poor fitting model: RMSEA = .224 (90% CI [.217, .232]), SRMR = .150, and CFI = .542 (refer to Table 7.8). A BIC score of 2829.44 was obtained for Model 1b.

Chi square and fit indices for the second and third models tested (see Figure 7.1, Model 2b and Model 3b, respectively) were also indicative of poor fitting models (refer to Table 7.8). A BIC score of 1577.67 was obtained for Model 2b and 759.35 for Model 3b, which indicated that, Model 3b was a substantial improvement over Model 1b and Model 2b.

For Model 3b, modification Indexes indicated that there were three conceptually meaningful parameters that should be freely estimated. These were the covariances between: (a) Order in Consciousness and Loss of Self-Consciousness, (b) Deep Concentration and Transformation of Time, and (c) error 11 and error 10, as both items ("*At work my attention was completely absorbed in what I was doing*" and "*At work I was fully focused on what I was doing*") were similar in wording. When freely estimating the new parameters, one parameter was freely estimated at a time and the analysis was rerun prior to freeing up the next conceptually meaningful parameter with a high modification index.

According to flow theory, the dimensions of flow are commonly experienced when one is in flow (Csikszentmihalyi, 1975). Therefore, it can be theoretically argued that the dimensions are likely related to one another, providing further justification for the covariances specified between the Order in Consciousness and Loss of Self-Consciousness, and Deep Concentration and Transformation of Time factors. Forgetting about the concept of our 'self' likely adds to order in consciousness as attentional resources are directed away from irrelevant thoughts and worries about the 'self' and towards the task at hand, creating order. The deep concentration experienced, whereby attention is focused on a limited stimulus field is likely related to the altered passage of time, as attentional resources are not available to keep track of the ordinary passage of time (Csikszentmihalyi, 2002).

The modified nested factor model (see Figure 7.3) revealed a χ^2 (99) = 360.57, $p < .001$ and absolute close fit indices indicative of an adequately well fitting model: RMSEA = .080 (90% CI [.071, .088]) and SRMR = .058. The incremental fit index was also indicative of an adequately well fitting model: CFI = .952 (refer to Table 7.8). As can be seen in Table 7.9 and Figure 7.3, factor loadings for all items were positive and statistically significant at the $p < .01$ level . Factor loadings ranged from .21 (Item MAA23) to .86 (Items LOS05 and LOS22). A BIC score of 686.61 was obtained for the modified Model 3b, indicating superior fit over Models 1b and 2b. To determine if this modified nested factor model had superior fit to the original nested factor model (Model 3b), as models were nested, a Tucker-Lewis index (TLI) value was used to make model comparisons (Tucker & Lewis, 1973). A superior model was determined by a model with a higher TLI value and a difference of .010 or greater (Vandenberg & Lance, 2000). The TLI index for the original nested factor model was .915, and.934 for the modified nested model. This amounted to a difference of .019, indicating that the modified nested factor model had superior fit. An inspection of the standardised residual covariance matrix indicated that only 5.9% of the elements were associated with values larger than 2.58, further confirming acceptable model fit.

Table 7.8

CFA of Three Competing Models of the Flow Scale (N = 419)

	χ^2	*df*	*p*	RMSEA	SRMR	CFI	BIC	TLI
Model 0b	5608.85	136	< .001	.310 (90% CI [.303, .317])	.420	.000	5711.49	-
Model 1b	2624.15	119	< .001	.224 (90% CI [.217, .232])	.150	.542	2829.44	-
Model 2b	1372.38	119	< .001	.159 (90% CI [.151, .166])	.331	.771	1577.67	-
Model 3b	451.42	102	< .001	.091 (90% CI [.082, .099])	.072	.936	759.35	.915
Model 3b (modified)	360.57	99	< .001	.080 (90% CI [.071, .088])	.058	.952	686.61	.934

Note. Model 0b = Null Model; Model 1b = Unrestricted; Model 2b = Restricted Five Factor; Model 3b = Nested Model – restricted five factor with a nested global factor; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual; CFI = comparative fit index; BIC = Bayesian information criterion; TLI = Tucker-Lewis index.

Table 7.9

Completely Standardised Factor Solutions of the Comparative Flow Scale Models: Unrestricted Model (Model 1b), Five Factor Restricted Model (Model 2b), and Nested Global and Restricted Five Factor Model (Model 3b modified; N = 419)

	Model 1b	Model 2b					Model 3b (modified)					
Item	Global	ORD	LOS	CON	TOT	MAA	Global	ORD	LOS	CON	TOT	MAA
ORD06	.74	.88					.67	.58				
ORD14	.74	.89					.71	.52				
ORD30	.78	.91					.74	.53				
LOS05	.43		.90				.28		.86			
LOS13	.45		.78				.33		.71			
LOS22	.52		.95				.41		.86			
LOS29	.48		.84				.37		.76			
CON04	.54			.81			.34			.78		
CON12	.62			.88			.45			.78		
CON21	.79			.81			.72			.47		
CON28	.66			.72			.61			.41		
TOT07	.77				.88		.67				.63	
TOT16	.79				.93		.74				.51	
TOT24	.80				.76		.75				.28	
MAA15	.61					.85	.68					.56
MAA23	.61					.67	.66					.21
MAA31	.39					.51	.44					.24

Note. All factor loadings except those in the MAA factor of Model 3b (modified), achieved statistical significance at $p < .001$. The factor loadings in the MAA factor of Model 3b (modified) achieved statistical significance at $p < .01$. ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness; Model 1b = Unrestricted; Model 2b = Restricted Five Factor; Model 3b = Modified Nested – restricted five factor with a nested global factor.

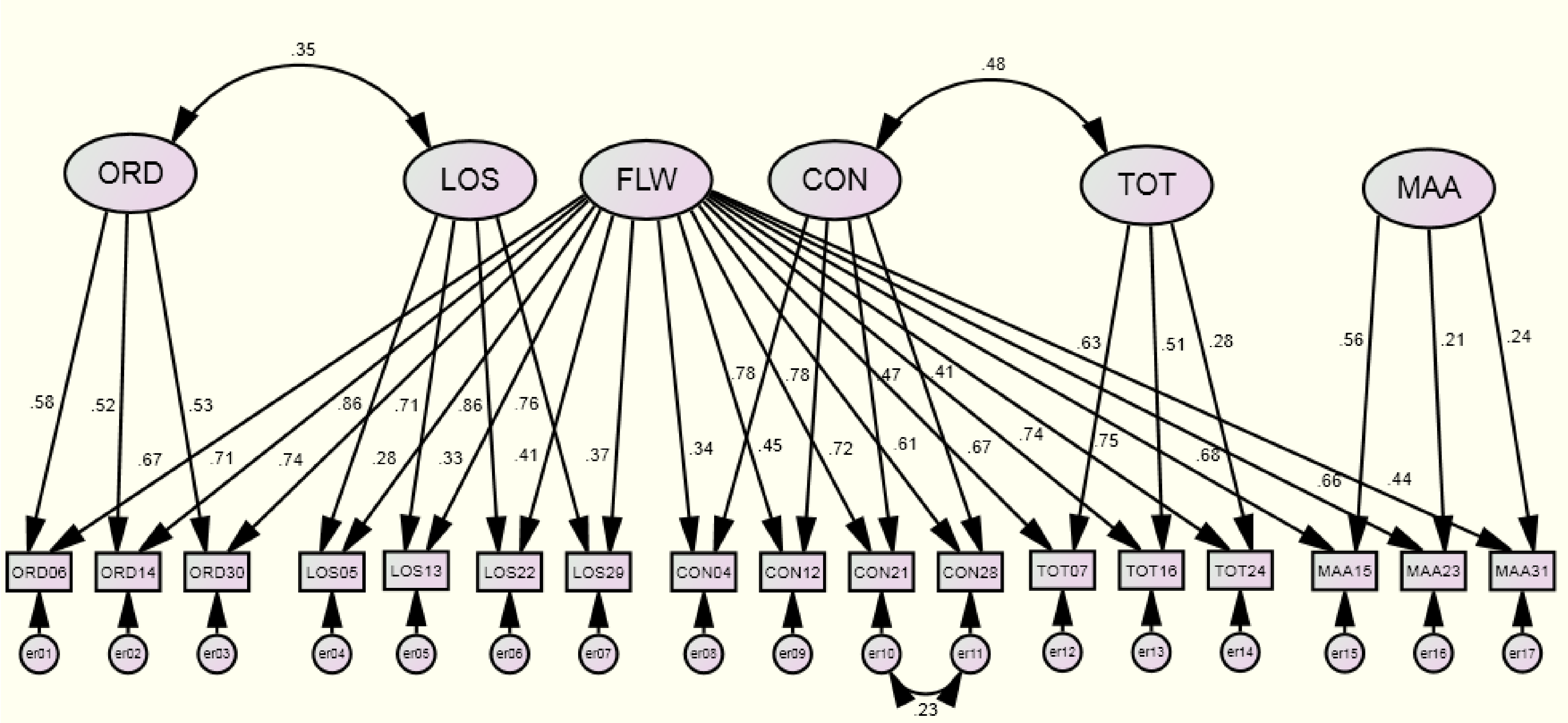


Figure 7.3. Nested model – Flow Scale. All factor loadings except those in the MAA factor achieved statistical significance at $p < .001$. Indicator variables were labelled using the subscale name and item number in scale (refer to Appendix A-18).The factor loadings in the MAA factor achieved statistical significance at $p < .01$. ORD = Order in Consciousness; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness; FLW = Flow.

7.6.4 Study 5 discussion

Using a newly recruited sample, Study 5 aimed to confirm the previously found factor structures of both scales (see Chapter 6). As hypothesised, previous factor structures of both the Conditions to Flow Scale and Flow Scale were confirmed by testing a series of progressively more complex models using CFA. For the Conditions to Flow Scale, the best fitting model contained four factors (Appropriate Challenge, Feedback, Clear Goals, and Control) and a global nested factor (Conditions to Flow). Similarly, for the Flow Scale, the best fitting model contained five factors (Order in Consciousness, Loss of Self-Consciousness, Transformation of Time, Deep Concentration, and Merging of Action and Awareness) and a nested global factor (Flow). It is important to note that for the Flow Scale, three model modifications were made and the respecified model (modified Model 3b) was tested using the same sample. Although modifications were seen as conceptually meaningful and all freely estimated parameters were found to be statistically significant, it is possible that the findings may be sample specific and as such, it is suggested that future cross-validation studies confirm the specified model in other samples.

As the results of Study 5 were derived from a new sample (other than the one used to develop the scale) they confirm that the previous findings from the EFAs (see Chapter 6) were not just sample specific. Additionally, as multiple models were tested using CFA, the results of the current study provide further evidence of factorial validity. For both scales, the findings that the nested models fit the data well also confirm the acceptability of interpreting items on two levels; (a) the subscale (narrow) level specific to each dimension, and (b) a global level representing either the total conditions to flow (Conditions to Flow Scale) or the flow experience (Flow Scale).

7.7 Conclusion

The studies in the present chapter aimed to further validate the Conditions to Flow Scale and Flow Scale. Study 3 provided evidence of known group validity by demonstrating that employees in high-skilled occupations scored higher on both on the Conditions to Flow Scale and on the Flow Scale than employees in low-skilled occupations. Additionally, evidence of discriminant validity for both developed scales was found by showing no large correlations between the scores on the scales and a social desirability scale. Study 4 provided evidence of convergent validity for the Flow Scale by revealing a large association with employee engagement. Lastly, Study 5 provided evidence of factorial validity by confirming the previously found factor structures of both scales using CFA. The Conditions to Flow Scale and Flow Scale were found to be best represented each by a single global factor with four (Appropriate Challenge, Clear Goals, Feedback, and Control) and five (Order in Consciousness, Loss of Self-Consciousness, Transformation of Time, Deep Concentration, and Merging of Action and Awareness) narrow factors, respectively.

To conclude, the three studies in the present chapter provide evidence of known group, discriminant, convergent, and factorial validity of the developed scales. To the best of the present researcher's knowledge, no currently available scale for measuring flow at work has been subjected to such a rigorous validation testing process.

Chapter 8

Antecedents and Outcomes of Flow

8.1 Overview

For both the Conditions to Flow and Flow Scales, the present research provided evidence of good internal consistency, and content, factorial, and construct validity. In this final chapter, the present researcher aims to examine the possible antecedents, and individual and organisational outcomes of experiencing flow at work.

8.2 Study 6: Introduction

8.2.1 Antecedents to flow.

As already discussed in Chapter 3, Csikszentmihalyi (1975) noticed in interviews that some dimensions of flow were dependent on others. More recently, researchers have suggested that some of these dimensions of flow may be better conceptualised as conditions to flow (Csikszentmihalyi et al., 2005; Fullagar et al., 2012; Nakamura & Csikszentmihalyi, 2002, 2009). As discussed in Chapter 6, pages 72-75, it is believed by the present researcher that the dimensions briefly described below, should be seen as the conditions that facilitate the flow experience.

Appropriate Challenge: Being adequately challenged, where one's skills are appropriately stretched so that he/she is not bored or anxious during an activity, has been described as a facilitator of flow (Nakamura & Csikszentmihalyi, 2002). Empirical research has found that being appropriately challenged was a characteristic responsible for flow among a sample of adolescents (Massimini & Carli, 1988; Massimini et al., 1987). Keller and Bless (2008) found in an experimental study that when the difficulty of a task (i.e., Tetris game) was adapted to suit the skill level of the participant (i.e., appropriately challenging condition), flow was experienced more often than when the difficulty was set too easy or too difficult.

Clear Goals: Having clear goals that do not contradict one another helps to determine what action one should take and is considered necessary for one to enter into and remain in a flow state. In a study conducted by Salanova, Bakker, and Llorens (2006), it was found that clear goals positively influenced flow among teachers.

Feedback: It is suggested that flow is more likely to occur when one receives prompt and immediate feedback about how he/she is performing (Nakamura & Csikszentmihalyi, 2002). In the work context, feedback can be received from peers, supervisors, managers, or provided by the task itself (e.g., a mathematician who solves a complicated formula). A. B. Bakker (2005) found that performance feedback in the workplace was conducive to flow among music teachers. Additionally, Demerouti (2006) has also found that feedback was related to flow among employees from various sectors and job positions.

Control: It is suggested that the flow experience is also more likely to occur when one feels a sense of control of the situation at hand or where one is not worried about the possibility of losing control (Csikszentmihalyi, 1999, 2002). A. B. Bakker (2005) found that job control contributed to the experience of flow. Similarly, Neilson and Cleal (2010) also found that control was a predictor of flow among line managers from both an accounting firm and a public elder care organisation.

8.2.2 Outcomes of flow.

Mental health was once, and is still often, viewed as simply the absence of mental illness (Keyes & Lopez, 2002). However, the absence of mental illness does not necessarily mean one is mentally healthy and productive. Modest correlations between mental health and mental illness (viz. depression; Ryff & Keyes, 1995) and CFAs of subscales of the Centre for Epidemiological Studies Depression Scale (CESD) and Scales of Psychological Well-being (Keyes, Ryff and Lee as cited in Keyes, 2002), empirically show that mental illness and mental health should not be considered polar opposites.

To provide a more complete picture of the human experience, Keyes (2005b; 2002) has operationalised mental health as the absence of mental illness and the presence of subjective well-being. Subjective well-being incorporates dimensions of emotional, psychological, and social well-being. Emotional well-being refers to the presence of positive affect, the absence of negative affect, and a general satisfaction with life. Psychological well-being includes dimensions of self-acceptance, positive relations with others, personal growth, purpose in life, environmental mastery, and autonomy. Thus those who are functioning well psychologically, are generally happy with themselves, have satisfying and trusting relationships, experience continued growth, feel that their lives have purpose and meaning, feel competent, and are self-determined. Social well-being includes dimensions of social acceptance, social actualisation, social contribution, social coherence, and social integration. Individuals are functioning well socially when they have positive views of most people, care about society, feel that they are contributing, believe that society is meaningful, and feel supported and part of their community. Therefore, according to this point of view, complete mental health is defined as the absence of a recent mental illness (i.e., during the past 12 months) and high levels of emotional, psychological, and social well-being (Keyes, 2002; Keyes & Lopez, 2002).

Flow experiences are said to improve the quality of life as they are moments of purposeful activity and enjoyment (Csikszentmihalyi, 2002). Although the present researcher is not aware of any research that has examined the relationship between flow and mental health, it has been shown that there are possible links between flow and various constructs said to resemble well-being. Csikszentmihalyi and LeFevre (1989) found that when participants were in flow, they had more positive experiences (i.e., they were happy, creative, and satisfied). Additionally, among both U.S. and Italian teenagers, it was found that when teenagers experience flow, they report above average levels of feeling alert, happy, cheerful, strong, friendly, active, sociable, excited, and satisfied (Carli et al., 1988). Rogatko (2009) found among college students assigned to a high-flow activity, that positive affect (PA) increased between measures before and after the activity had been completed, while those assigned to the low-flow activity had PA scores that decreased. Fullagar and Kelloway (2009) found among architecture students that momentary flow was related to lagged momentary positive mood, however, momentary mood was not found to be related to lagged momentary flow, suggesting a positive relationship between flow and mood and that flow precedes changes in mood. Flow has also been found to be positively related to subjective well-being among samples of both college students (Clarke & Haworth, 1994) and office workers (Bryce & Haworth, 2002).

Self-determination theory (SDT) provides a theoretical framework for understanding the effects flow may have on mental health. Flow activities, as discussed in Chapter 4 (see page 45), typically contain a number of innate psychological needs (competency, autonomy, and relatedness) suggested by SDT to be responsible for health and well-being (Ryan & Deci, 2000). From the above reviewed literature, it is likely that flow at work is associated with better mental health.

When in flow, all available psychic energy is directed towards the task at hand; one is completely immersed (Csikszentmihalyi, 1975, 2002), and operates at full capacity (Nakamura & Csikszentmihalyi, 2002). Given that during flow one operates at his/her peak, it is reasonable to expect that flow is related to job performance. In both sport and music domains, research has found a positive association between flow and performance (C. Byrne et al., 2003; S. A. Jackson et al., 2001). In the workplace, studies show that workers who experience more flow at work, spend more time at work working and being more productive (Csikszentmihalyi, 1978). Demerouti (2006) found that flow in the workplace was positively related to both in-role and extra-role performance, but only for those more conscientious employees. Additionally, A. B. Bakker (2008) found that the commonly used dimensions of flow (work enjoyment and intrinsic motivation) were related to performance. Specifically, it was found that work enjoyment was a predictor of in-role performance and intrinsic motivation was a predictor of extra-role performance. In the employee engagement literature, research has revealed a link between employee engagement and both in-role and extra-role performance (A. B. Bakker, Demerouti, & Verbeke, 2004). As flow and employee engagement are similar constructs, this finding also provides support for the possible link between flow and job performance.

Flow was first identified in people who were thoroughly engrossed in activities that contained very few to no external rewards at all. Performing the activity was seen as rewarding in and of itself and this was the primary reason why the activity was carried out (Csikszentmihalyi, 2002). Flow activities have been considered to be such a great source of enjoyment that they may even become addictive. In the employee engagement literature, a concept similar to flow (see section 4.2.4), it is often found that employee engagement is negatively related to turnover intentions (Schaufeli & Bakker, 2004); suggesting that engaged employees are less likely to leave their current employment. Additionally, in the employee engagement literature there is also evidence that being engaged is a negative predictor of future sick leave, meaning that engaged employees are less likely to take future sick leave (Schaufeli, Bakker, & Van Rhenen, 2009). As flow involves intense engagement in a task, and is considered to be an enjoyable experience, it is reasonable to expect that flow at work would be a predictor of work involvement: job performance (positive), absenteeism (negative), and turnover intentions (negative).

Given the expectation that the conditions to flow predict flow and that flow will in turn predict mental health and work involvement (job performance, absenteeism, and turnover intentions), it is possible that flow may mediate the relationship between the conditions to flow and mental health and work involvement. It is believed that if the conditions to flow occur often, one is likely to frequently experience flow, and as a consequence, experience better mental health and increased work involvement. In support of this idea, there is evidence that similar situational work factors to the conditions to flow, such as skill variety, time pressure, feedback, rewards and recognition, job autonomy, and job control have all been associated with mental health and work involvement (job performance, absenteeism, and turnover intentions; Bouville, 2009; Fried & Ferris, 1987; Jones & Fletcher, 2003; Morgeson, Delaney-Klinger, & Hemingway, 2005; Saks, 2006; F. L. Schmidt & Hunter, 1998). Furthermore, similar constructs, such as employee engagement have also been found to mediate the relationship between workplace conditions (e.g., job demands and job resources) and outcomes (e.g., job turnover; Schaufeli & Bakker, 2004).

Lastly, it is also reasonable to expect that mental health may influence work outcomes, such as job performance, absenteeism, and turnover intentions. Previous research has found that stress was negatively associated with job performance (Stewart & Barling 1996). In a recent review of the impact depression has on the workplace, it was revealed that depressed individuals have more absences and performance deficits than non-depressed individuals (Lerner & Henke, 2008). Adler et al., (2006) compared a group of patients diagnosed with major depressive disorder or dysthymia to a group of individuals with rheumatoid arthritis and a control group (depression free) and found that the depressed group had significantly lower job performance levels than the two other groups. Furthermore, it was found that depression severity was negatively related to job performance. Interestingly, for those diagnosed with depression and whose depressive symptoms improved above clinical levels, job performance still remained consistently lower than that for the control group. This last finding is consistent with the suggestion that the absence of mental illness does not necessarily mean one is functioning well (Keyes, 2002). Additionally, research has revealed that those who have complete mental health (absence of recent mental illness and high levels of well-being) are less likely to be absent from work than those with low levels of well-being or mental illness (Keyes, 2002). Fredrickson's (1998, 2001) broaden-and-build theory may explain the possible positive effects mental health can have on work involvement. According to this theoretical framework, positive emotions, which are a facet of mental health (i.e., emotional well-being), help to build enduring physical, intellectual, social, and psychological resources, which in turn likely result in superior functioning (Fredrickson, 1998, 2001).

The literature reviewed above suggests that a number of the conditions to flow identified in flow theory may be responsible for the flow experience, which in turn is likely responsible for a number of positive outcomes. However, little research has provided evidence that the conditions to flow are predictive of flow experiences in the workplace. Additionally, to the best of the present researcher's knowledge, no research has examined if flow is related to a global measure of mental health. To further understand the potential benefits of flow in the work place, the present study aimed to examine the antecedents to flow as identified in flow theory and the possible individual and organisational outcomes of experiencing flow at work. It was hypothesised that:

H1: The conditions to flow (appropriate challenge, clear goals, feedback, and control) experienced at work would be positive predictors of flow at work.

H2: Flow at work would be a positive predictor of mental health.

H3: Flow at work would be a predictor of work involvement: job performance (positive), turnover intentions (negative), and absenteeism (negative).

H4: Flow at work would mediate the relationship between the conditions to flow and outcomes: mental health and work involvement (job performance, absenteeism, and turnover intentions).

H5: Mental health would be a predictor of work involvement outcomes: job performance (positive), absenteeism (negative), and turnover intentions (negative).

8.3 Method

8.3.1 Participants.

The sample was a convenience sample of 590 participants. Additional details of the sample used in this study are presented in section 7.4.2, page 144.

8.3.2 Measures.

Conditions to Flow Scale: Refer to Study 3 of Chapter 7, page 134, for further information about this scale. In this current study, Cronbach's alpha coefficient for the Conditions to Flow Scale was .94 (see Appendix A-18 for scale).

Flow Scale: Refer to Study 3 of Chapter 7, page 134, for further information about this scale. In this current study, the Cronbach's alpha coefficient for the Flow Scale was .91 (see Appendix A-18 for scale).

DASS 21 (Depression Scale): The DASS 21 (Depression Scale) is a 7 item scale (e.g., "*I found that I had nothing to look forward too*") where participants respond using a 4-point Likert type scale: 0 = *Did not apply to me at all*; 1 = *Applied to me to some degree, or some of the time*; 2 = *Applied to me a considerable degree, or a good part of the time*; and 3 = *Applied to me very much, or most of the time*. The DASS Depression Scale has been well validated, and found to correlate well (r = .74) with the Beck Depression Inventory (BDI; Lovibond & Lovibond, 1995). In the present study, the Cronbach's alpha coefficient for the Depression Scale was .90 (see Appendix A-27 for scales).

Emotional Well-Being Scale: Respondents were asked to rate how often they felt six positive affect symptoms (e.g., "*Cheerful*" and "*In good spirits*"), using a 5-point scale: 0 = *none of* *the time,* 1 = *a little,* 2 = *some,* 3 = *most, and* 4 = *all of the time*. The reported Cronbach's alpha coefficient in the present study for this scale was .89. Participants were also asked to rate their life satisfaction overall using a scale where 0 = *worst possible life overall* to 10 = *the best possible life overall* (Keyes, 2002; see Appendix A-28 for scale).

Scales of Psychological Well-Being: Consists of six scales of psychological well-being: Autonomy (e.g., "*I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people*"), Environmental Mastery (e.g., "*In general, I feel I am in charge of the situation in which I live*"), Personal Growth (e.g., "*In general, I feel that I continue to learn more about myself as time goes by*"), Positive Relations with Others (e.g., "*I feel like I get a lot out of my friendships*"), Purpose in Life (e.g., "*I feel good when I think of what I've done in the past and what I hope to do in the future*"), and Self Acceptance (e.g., "*When I look at the story of my life, I am pleased with how things have turned out*"). Participants respond using a 6-point Likert scale: 1 = *strongly disagree* to 6 = *strongly agree* (Ryff, 1989). Due to issues with the original dimensionality of the scales, a modified version found to have superior factorial validity was used, as found by Dirk (2004). The Cronbach's alpha coefficient in the present study was .95 (see Appendix A-29 for scales).

Social Well-Being Scales: Consists of five, 3 item scales which measure how much individuals see themselves as thriving in their social life: Social Integration (e.g., "*I don't feel I belong to anything I'd call a community*"), Social Acceptance (e.g., "*People who do a favour expect nothing in return*"), Social Contribution (e.g., "*I have something valuable to give to the world*"), Social Actualisation (e.g., "*The world is becoming a better place for everyone*"), and Social Coherence (e.g., "*The world is too complex for me*").The Cronbach's alpha in the present study was .84 (see Appendix A-30 for scales).

Absenteeism: The absenteeism questions from the World Health Organisation's Health and Work Performance Questionnaire Short Form (WHO HPQ short form) were used to measure absenteeism. Measured as hours lost per month, it was calculated by subtracting how many hours a participant was expected to work from actual hours worked (Kessler et al., 2004; Kessler et al., 2003; see Appendix A-31 for questionnaire).

Job Performance: Job Performance was measured using the presenteeism questions of the World Health Organisation's Health and Work Performance Questionnaire (WHO HPQ). Presenteeism is a measure of self-reported performance. Participants respond to each question (e.g., "*How would you rate your overall job performance on the days you worked during the past 4 weeks [28 days]?*") using a 0 = *worst job performance anyone could have at your job* to 10 =

performance of a top worker rating scale (Kessler et al., 2004; Kessler et al., 2003). In addition, two questions from Huang (2008) were also included to better capture one's level of performance (i.e., "*Using the same 0-10 scale how would your peers rate your job performance during the past 4 weeks [28 days]?"* and "*Using the same 0 to 10 scale, how would your supervisor rate your job performance during the past 4 weeks [28 days]?*"). The Cronbach's alpha coefficient in the present study for this scale was .85 (see Appendix A-31 for scale).

Turnover Intentions: Turnover intentions were measured using 5 items developed by Bozeman and Perrewe (2001; e.g., "I will probably look for a new job in the future"). Participants respond using a 5-point Likert scale: 1 = *strongly disagree* to 5 = *strongly agree*. The Cronbach's alpha coefficient in the present study for this scale was .89 (see Appendix A-32 for scale).

8.3.3 Procedure.

As this study used the same dataset as Study 4 and 5, details of the procedure can be found in section 7.4.1, page 143.

8.3.4 Data analysis.

When assessing full structural models, indicators of latent variables can be formed by: (a) a single individual item (total disaggregation model), (b) a composite subset of items (partial disaggregation model), (c) scores from existing scales (partial aggregation model), or (d) the aggregates of scale scores (total aggregation model; Hall, Snell, & Foust, 1999). Bentler and Chou (1987) recommend that no more than 20 observed variables be included in a structural model. Given that the specified structural model in this present study would contain more than 20 observed variables when applying a total disaggregation or partial disaggregation model, indicators of latent variables were formed by using either a partial aggregation model or total aggregation model. Provided that a single unidimensional scale represents a latent construct, both the partial aggregation and total aggregation models have been found to produce identical disattenuated structural coefficient estimates to that of a total disaggregation and a partial disaggregation model (Sass & Smith, 2006). Therefore, they are considered to be appropriate techniques for forming indicator variables of unidimensional scales (Sass & Smith, 2006).

A full structural model contains both relations between indicator variables and latent variables (measurement portion of the model) and relations among latent variables (structural portion of the model). Prior to assessing structural models, it is necessary to confirm the structure of the measurement model (i.e., confirm that the indicator variable(s) that represent latent variables are unidimensional). This procedure therefore utilises a two stage modelling approach (J. C. Anderson & Gerbing, 1988). Furthermore, as the present researcher used the total aggregation model, it was necessary to first confirm the unidimensionality of scales used in analysis (B. M. Byrne, 2001). Therefore, prior to testing the present study's first hypothesis, CFAs were performed to confirm the unidimensionality of all latent variables. For each latent variable, an unrestricted single global factor model was specified, where all indicator variables were freely allowed to load on a global factor. These models were identified by constraining the single global factor variable variance to 1.0.

For the total aggregation models (i.e., Conditions to Flow and Flow), where indicators were aggregates of scale scores, structural coefficients were disattenuated by fixing error variances to their unexplained error variance using the formula:

$$\eta = \sigma^2_\eta - (\sigma^2_\eta \alpha)$$

Where η is the unexplained error variance, σ^2_η is the total variance for a scale and α is the Cronbach's alpha coefficient (Sass & Smith, 2006).

All structural equation modelling (SEM) analyses were based on Pearson covariance matrices using the ML estimation method and were executed using AMOS 18.0 graphics. To assess overall model fit, R. B. Kline's (2011) recommendations were adopted whereby model fit was assessed using a combination approach of the chi-square test, absolute close fit indices: RMSEA (Steiger & Lind as cited in Worthington & Whittaker, 2006) and SRMR (Bentler, 1995), and incremental fit index: CFI (Bentler, 1990).

Models were seen as good fitting when the absolute close fit indices: RMSEA and SRMR were less than or equal to .06 and .08, respectively, and the incremental fit index (CFI) was greater than .95 (Hu & Bentler, 1999). To avoid over reliance on global fit indices, an examination of standardised residual matrices was used to determine if specific variables or relations have been accounted for (Bollen, 1989; Hayduk, 1987), and also parameter estimates were used to assess the appropriateness of signs and magnitudes (D. L. Jackson et al., 2009).

To determine whether flow fully mediated or partially mediated the relationship between the conditions to flow and outcomes, two models were tested (see Figure 8.1). As models being compared were nested, a TLI value was used to make model comparisons (Tucker & Lewis, 1973). A superior model was determined by a model with a higher TLI value and a difference of .010 or greater (Vandenberg & Lance, 2000).

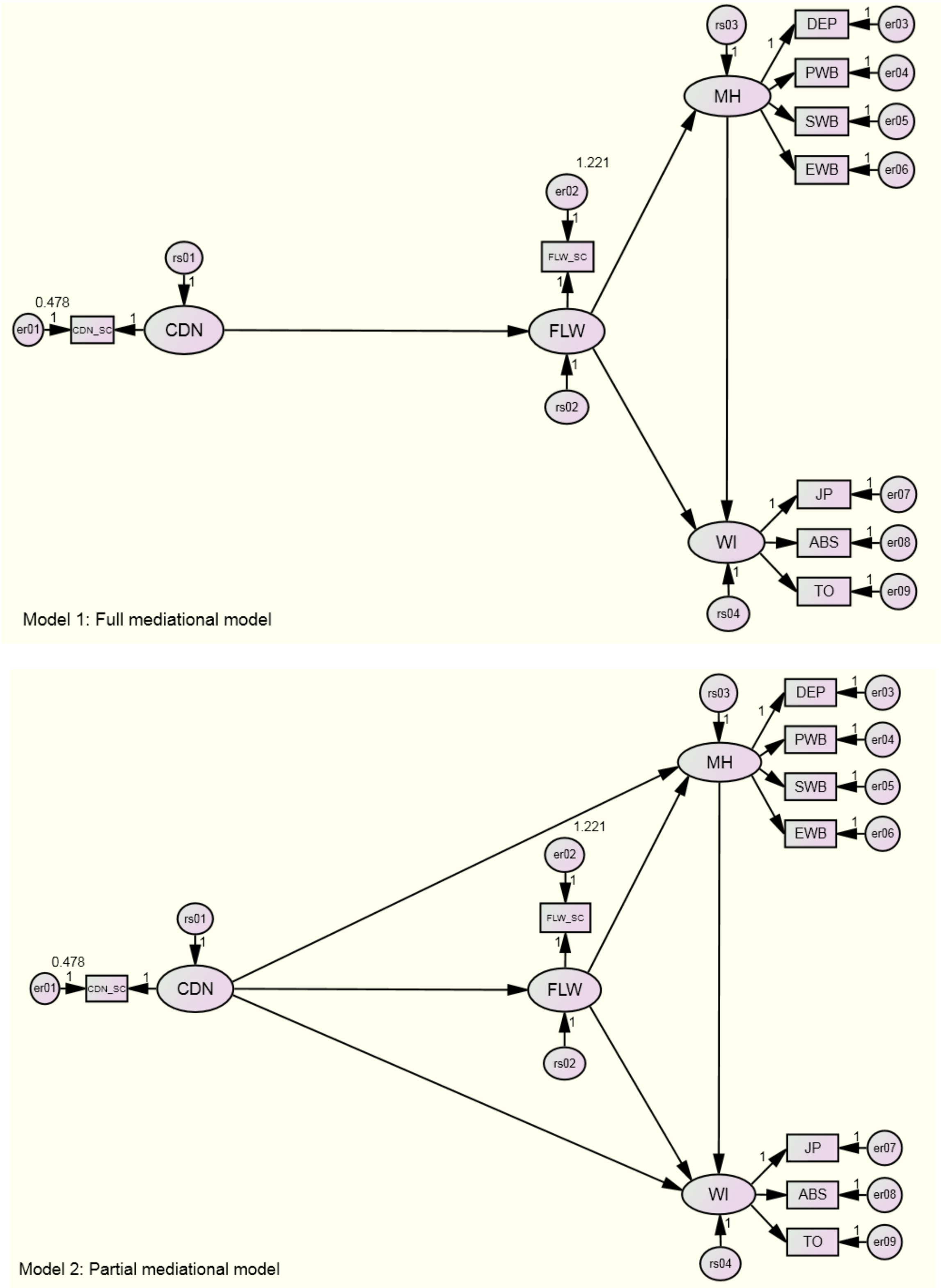


Figure 8.1. Proposed full meditational (Model 1) and partial mediation model (Model 2). CDN = Conditions to Flow; FLW = Flow; MH = Mental Health; DEP = Depression; PWB = Psychological Well-being; SWB = Social Well-being; EWB = Emotional Well-Being; WI = Work Involvement; JP = Job Performance; ABS = Absenteeism; TO = Turnover Intentions.

8.4 Results.

8.4.1 Data screening prior to assessing the unidimensionality of latent variables in the structural model.

The unidimensionality of the Conditions to Flow Scale and the Flow Scale have already been established (refer to Study 5 of Chapter 7 for results). For the remaining latent variables in the structural model (i.e., mental health and work involvement), data were screened for multivariate outliers, linearity, multicollinearity, and singularity. Screening for out of range values, normality, potential univariate outliers, and missing data, and the handling of data imputation were previously dealt with and are described in section 7.4.3.2, page 146.

Multivariate outliers for each CFA model (see Figures 8.2 and 8.3 for models) were identified through Mahalanobis distance critical values and subsequently removed. For each model, an inspection of scatter plots of the most highly skewed and the most negatively skewed scales, confirmed that the assumption of linearity was not violated. Collinearity statistics revealed no evidence of multicollinearity or singularity.

8.4.2 Assessing the unidimensionality of latent variables in structural model.

To test the unidimensionality of the mental health and work involvement latent variables in the specified models (see Figure 8.1), both latent variables were subjected to CFA. Confirmatory factor analyses revealed adequately well fitting models for both latent variables (see Table 8.1). As can be seen in Figure 8.2 and Figure 8.3 all factor loadings for the two unrestricted global models were positive and statistically significant at the $p < .001$ level, except for the factor loading of absenteeism, which was subsequently removed from the full structural model. For both models, an inspection of the standardised residual covariance matrix indicated that no elements were associated with values larger than 2.58, further confirming acceptable model fit and unidimensionality.

Table 8.1

CFAs Confirming the Unidimensionality of the Mental Health and Work Involvement Latent Variables

	χ^2	*df*	*p*	RMSEA	SRMR	CFI	*n*
MH							
H_1	8.614	2	= .013	.076 (90% CI [.029, .131])	.024	.988	328
H_0	580.136	6	< .001	.407 (90% CI [.380, .436])	.350	.000	328
WI							
H_1	1.646	1	= .199	.045 (90% CI [.000, .163])	.028	.950	325
H_0	1155.695	4	< .001	.114 (90% CI [.062, .172])	.090	.000	325

Note. MH = Mental health; WI = Work Involvement; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual; CFI = comparative fit index; H_1 = hypothesised unrestricted single global factor model; H_0 = null model.

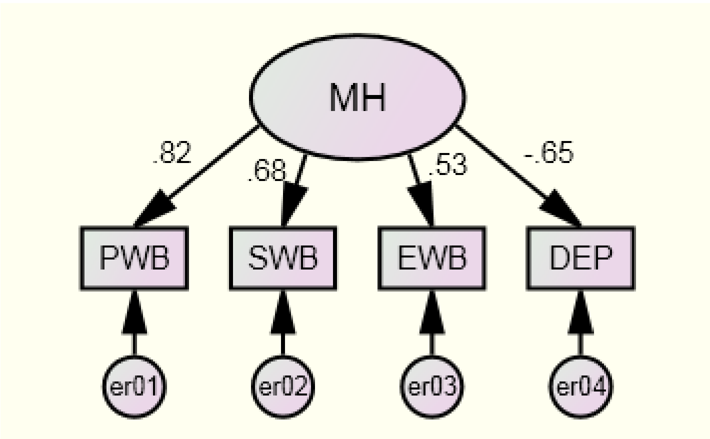


Figure 8.2. Unrestricted single global factor model for mental health (MH). All factor loadings achieved statistical significance at p < .001. PWB = psychological well-being; SWB = social well-being; EWB = emotional well-being; DEP = depression.

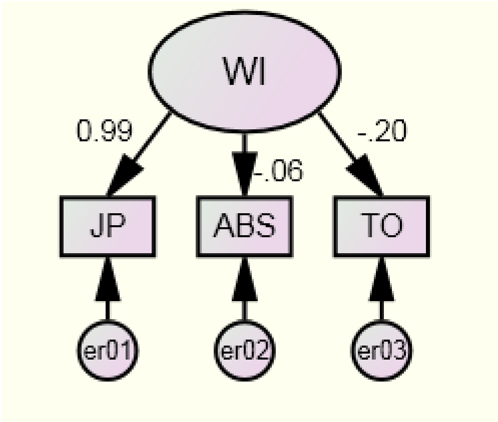


Figure 8.3. Unrestricted single global factor model for work involvement (WI). All factor loadings achieved statistical significance at p < .001, except absenteeism (ABS). JP = job performance; TO = turnover intentions.

8.4.3 Structural model testing.

Prior to analysis, data were screened for multivariate outliers, linearity, multicollinearity, and singularity. Other data screening (i.e., out of range values, normality, potential univariate outliers, and missing data) and the handling of data imputation were previously dealt with and are described in section 7.4.3.2, page 146. Multivariate outliers were identified through Mahalanobis distance critical values and subsequently removed. For each hypothesised relationship in the models (see Figure 8.1), scatter plots confirmed that the assumption of linearity was not violated. Collinearity statistics revealed no evidence of multicollinearity or singularity. Prior to testing the hypothesis of the present study, means, standard deviations, Cronbach’s alpha coefficients, and intercorrelations of scales were examined.

Table 8.2

Means, Standard Deviations, Cronbach's alpha Coefficients, and Intercorrelations of Scales in Model (N = 572)

Scales	*M*	*SD*	α	1	2	3	4	5	6	7
1. CDN	13.73	2.84	.94							
2. FLW	13.94	3.61	.91	.52**						
3. DEP	8.65	7.77	.90	-.31**	-.19**					
4. PWB	26.73	3.87	.95	.38**	.17**	-51**				
5. SWB	23.47	4.07	.84	.35**	.25**	-.44**	.58**			
6. EWB	2.26	0.70	.89	.31**	.17**	-.38**	.42**	.31**		
7. TO	2.64	1.08	.89	-.32**	-.16**	.12**	-.11*	-.16**	-.10*	
8. JP	74.95	13.94	.85	.46**	.29**	-.27**	.37**	.25**	.31**	-.17**

Note. CDN = Conditions to Flow; FLW = Flow; DEP = Depression; PWB = Psychological Well-Being; SWB = Social Well-Being; EWB = Emotional Well-Being; TO = turnover intentions; JP = job performance; ** $p < .001$; * $p < .05$.

As can be seen in Table 8.2, all scales have high Cronbach's alpha coefficients, well above the acceptable minimum .60 criteria (DeVellis, 2003). Additionally, it can be seen that there are significant correlations between the Conditions to Flow Scale and Flow Scale, and significant correlations between both the Conditions to Flow and Flow Scale and outcome measures.

To test the present study's hypotheses, both specified models (Model 1 and 2; see Figure 8.1) were subjected to SEM analysis. The first model tested, Model 1, revealed a chi-square test, absolute close fit indices (and incremental fit index indicative of a poor fitting model (refer to Table 8.3). The TLI index was also indicative of a poor fitting model (refer to Table 8.3).

The second model tested, Model 2 (see Figure 8.4), revealed a chi-square test, absolute close fit indices, and incremental fit index indicative of an adequately well fitting model (refer to Table 8.3). The obtained TLI index of Model 2, indicated that this model has superior fit over Model 1 (an improved difference of .206; refer to Table 8.3). An inspection of the standardised residual covariance matrix indicated that no elements were associated with values larger than 2.58, further confirming acceptable model fit.

Table 8.3

Model fit Indices of the Specified Full Meditational (Model 1) and Partial Mediation Model (Model 2; *N = 572)*

	χ^2	*df*	*p*	RMSEA	SRMR	CFI	TLI
Model 1	193.427	18	<. 001	.131 (90% CI [.114, .148])	.099	.840	.751
Model 2	43.080	16	<. 001	.054 (90% CI [.035, .074])	.032	.975	.957

Note. Model 1 = full mediational model; Model 2 = partial meditational model; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual; CFI = comparative fit index; TLI = Tucker-Lewis index.

As the superior model (Model 2) contained an indirect effect, the bootstrapping method was used to examine the statistical significance of both the indirect and total effects (Bollen & Stine, 1990; Shrout & Bolger, 2002). The direct, indirect, and total effects found in Model 2 are presented in Table 8.4.

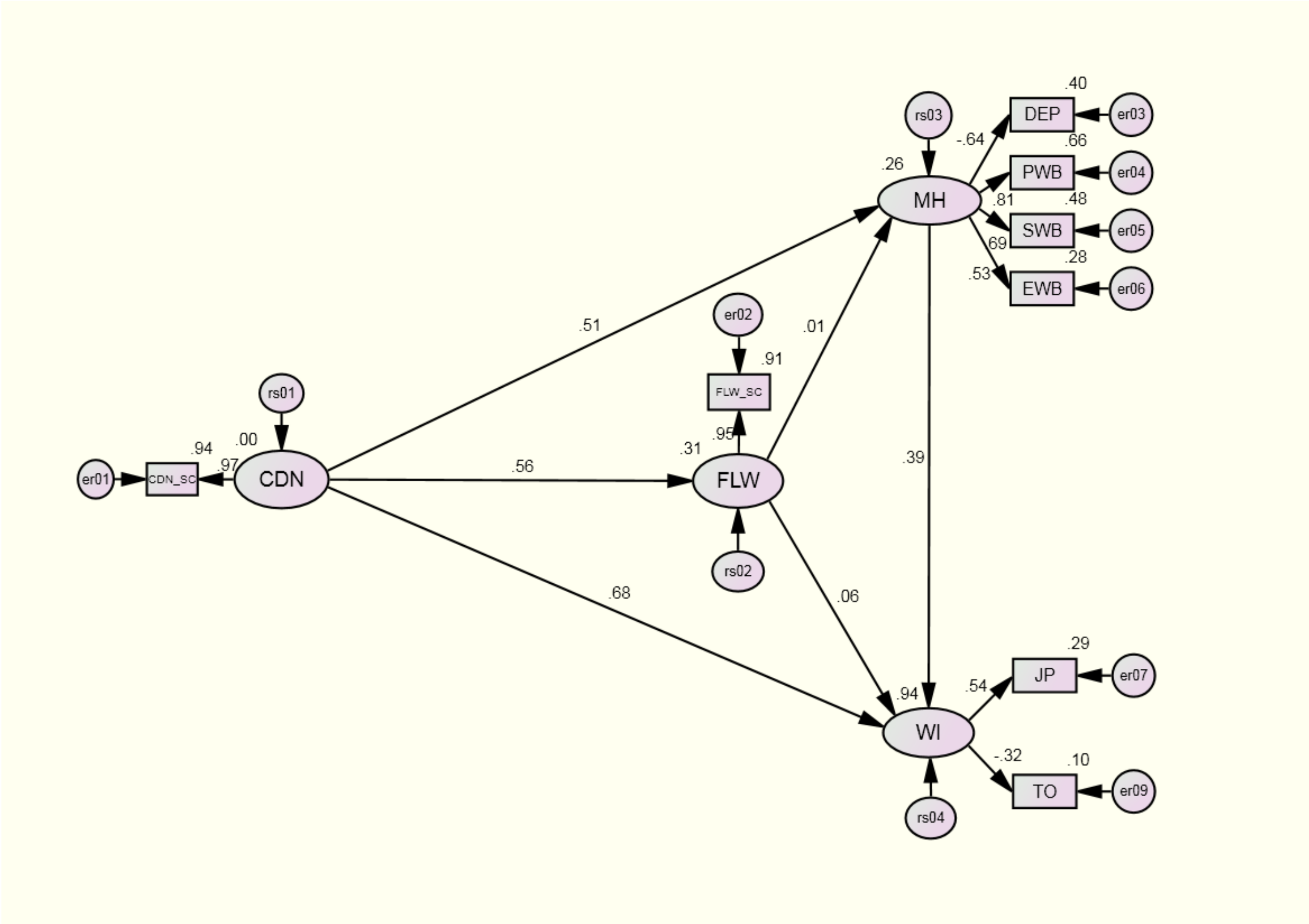


Figure 8.4. Partial mediation model. CDN = Conditions to Flow; FLW = Flow; MH = Mental Health; DEP = Depression; PWB = Psychological Well-being; SWB = Social Well-being; EWB = Emotional Well-Being; WI = Work Involvement; JP = Job Performance; TO = Turnover Intentions.

Table 8.4

Standardised Direct, Indirect, and Total Effects on Flow, Mental Health, and Work Involvement (N = 572)

	FLW			MH			WI		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
CDN	.56**	-	.56**	.51**	-	.51**	.68**	.23**	.91**
FLW	-	-	-	.01	-	.01	.06	-	.06
MH	-	-	-	-	-	-	.39**	-	.39**

Note. FLW = Flow; MH = Mental health; WI = Work involvement; CDN = Conditions to flow; ** $p < .001$.

As can be seen in Table 8.4, SEM analyses revealed that the score on the Conditions to Flow Scale was a positive predictor of flow ($\beta = .56$, $p < .001$), mental health ($\beta = .51$, $p < .001$) and work involvement ($\beta = .68$, $p < .001$). Flow was not found to be a statistically significant predictor of mental health or work involvement in this model. This suggests that in the current model, flow did not contribute any unique variance in mental health or work involvement, over and above the conditions to flow. Mental health was found to be a positive predictor of work involvement ($\beta = .39$, $p < .001$). Additionally, it was found that the relationship between the conditions to flow and work involvement was partially mediated by mental health ($\beta = .23$, $p < .001$).

8.5 Discussion

The aim of the present study was to further examine the possible antecedents to and positive individual and organisational outcomes of experiencing flow at work. The first hypothesis, that the conditions to flow indentified in flow theory (appropriate challenge, clear goals, feedback, and control) would be predictive of flow at work, was supported. The findings from the SEM revealed that the score on the Conditions to Flow Scale was a statistically significant predictor of flow, and suggests that being appropriately challenged at work, having clear goals, a sense of control, and knowing how well one is performing, may create flow experiences at work.

This finding is consistent with existing literature on the antecedents of flow (Csikszentmihalyi, 1999, 2002; Nakamura & Csikszentmihalyi, 2002, 2009), and is in line with previous research findings in both organisational (A. B. Bakker, 2005; Demerouti, 2006; Nielsen & Cleal, 2010; Salanova et al., 2006) and non-organisational contexts (Massimini & Carli, 1988; Massimini et al., 1987). This finding also provides evidence of predictive validity for the

Conditions to Flow Scale, in that the score on the Conditions to Flow Scale was found to positively predict flow.

The results from the present study did not provide support for the second, third or fourth hypothesis. Flow was not found to be a unique predictor of mental health (H2) or of work involvement (H3), over above the conditions to flow. It was also not found to mediate (either partially or fully) the relationship between the conditions to flow and mental health and work involvement (H4). However, the score on the Conditions to Flow Scale was found to be a positive predictor of both mental health and work outcomes. This finding suggests that those who experience more of the conditions to flow, as identified in flow theory (i.e., appropriate challenge, clear goals, control, and feedback), are likely to experience better mental health, and be more involved in their work.

The fifth hypothesis was that mental health would be a positive predictor of work involvement. Results provided support for this hypothesis, suggesting that those who have better mental health are also likely to be more involved in their work. This finding is consistent with previous research which has found links between mental health and work involvement (Adler et al., 2006; Keyes, 2002; Stewart & Barling 1996) and also the broaden-and-build theory, in that emotional well-being builds intellectual resources, allowing one to deal more effectively with tasks (Fredrickson, 1998, 2001).

A possible explanation for the unexpected finding that flow did not predict mental health and work involvement over and above the conditions to flow (H2, H3, and H4) is that for the conditions to flow, it is likely that the presence of any one condition may have a positive effect on mental health and work involvement; they do not all have to be present at the same time. Previous research has shown that there are a number of similar situational work factors, such as skill variety, time pressure, feedback, rewards and recognition, job autonomy, and job control, that have been associated with mental health and work involvement (Bouville, 2009; Fried & Ferris, 1987; Jones & Fletcher, 2003; Morgeson et al., 2005; Saks, 2006; F. L. Schmidt & Hunter, 1998). However, for the flow experience to occur a number of conditions need to be present at the same time (i.e., appropriate balance between challenge and skill, where one's skills are appropriately stretched; clear goals; feedback; and a sense of control). Therefore, it is likely easier for a single condition to flow to be present and have a positive effect on mental health and work involvement than the flow experience, which requires a number of the conditions to be present at the same time. It is therefore suggested that as each of the conditions to flow are likely to have a positive effect on their own and are more likely to be experienced than the flow experience, this may explain why the conditions to flow were found to be predictive of the outcomes (i.e., mental health and work involvement) when flow was not.

Another possible explanation is that flow is unlikely to be a stable characteristic in the workplace. Conceptually, unlike employee engagement which is more of a pervasive state (Schaufeli et al., 2002) and has been shown to mediate the relationship between antecedents and outcomes (Schaufeli & Bakker, 2004), flow is seen to be activity specific (Nakamura & Csikszentmihalyi, 2009). In contemporary workplaces where many tasks are performed, it is unlikely that flow is experienced consistently from one task to the next. A key determinant of flow is the dynamic interaction between person and environment, where an individual's perceived capabilities are appropriately stretched (neither underutilised nor overstretched) to meet the demands of the activity (Nakamura & Csikszentmihalyi, 2002). Without this appropriate 'stretching', the flow experience is likely to be disrupted or cease. Providing further support for the instability of flow is research examining within-individual variability of flow, which indicates that for most people, flow experiences are not stable and tend to fluctuate over time (Ceja & Navarro, 2009, 2011; Guastello et al., 1999). It may be that experiencing brief frequent moments of flow throughout the day at work may not be enough to have a positive effect on one's mental health or work involvement, over and above the conditions to flow. The conditions to flow on the other hand are likely more enduring, for example, a surgeon performing surgery, from start to finish, clearly knows what to do during an operation (i.e., has clear goals) and receives ongoing information as to how the surgery is going by patient monitoring equipment (i.e., feedback). Given that the flow experience requires a number of antecedents and is likely unstable in the workplace, it is suggested that future research should examine possible outcomes of flow in experimental designs. In an experimental design, flow can be induced and maintained over a period of time to determine the frequency with which flow needs to be experienced before positive outcomes (if any) occur. A possible explanation as to why absenteeism was not found to be an indicator of work involvement is that people may be absent from work due to reasons other than not wanting to be involved in work (e.g., personal injury, sickness, or the need to care for dependants).

Although in the present study, flow was not found to be a predictor of mental health and work involvement over and above the conditions to flow, Table 8.2 shows significant correlations between flow and mental health (depression and psychological, social, and emotional well-being) and work involvement (job performance and turnover intentions). These findings suggest that flow may also likely be related to mental health and work involvement. However, the present study found that flow does not contribute any unique variance over and above the conditions to flow. This provides evidence to suggest that flow may be facilitated by the conditions to flow; however, flow is unlikely to have a positive effect on mental health and work involvement.

It is believed that this study is the first to empirically show that the positive outcomes often found from experiencing flow (Bryce & Haworth, 2002; C. Byrne et al., 2003; Clarke & Haworth, 1994; Csikszentmihalyi & LeFevre, 1989; Eisenberger et al., 2005; Fullagar & Kelloway, 2009; S. A. Jackson et al., 2001; Rogatko, 2009) may not necessarily be due to the flow experience itself but rather the conditions known to facilitate it. Previous scales of flow used in research, as detailed in Chapter 5, have often confounded the measurement of flow by including items that assess the antecedents to flow. The findings from this study raise concerns about previous research results and suggest that the associations found between flow and outcomes are possibly confounded with the antecedents of flow. Furthermore, this study highlights the need for flow research to employ more valid measures of flow that capture the experiential state without confounding it with its antecedents.

Given the likely positive benefits of experiencing the conditions to flow, it is suggested that the determinants of organisational success and employee mental health may lie in a company's ability to appropriately challenge their staff, provide regular feedback, clearly defined tasks, and structure tasks so as to allow one to feel in control of their work. The small investment required to make work more conducive to flow will likely have large benefits for both employee and organisation (Csikszentmihalyi, 2002). Lastly, although often ignored in the workplace, as profits and productivity are the primary concerns for organisations (Csikszentmihalyi, 2002), this study highlights the importance employee mental health may have on organisational success, in terms of improving performance and lowering turnover intentions.

As the findings of the present study do not provide evidence of causation, it is possible that the outcomes in the model (i.e., mental health and work involvement) may be responsible for the antecedents (i.e., conditions to flow). For example, according to the broaden-and-build theory, it is reasonable to expect that improving mental health, may increase one's thought-action repertoire, which may in turn make employees more able to recognise feedback, better understand the goals of the task, feel in control, and perceive that they have the appropriate skills to perform tasks (Fredrickson, 1998, 2001). Additionally, according to the broaden-and-build theory, it is suggested that reciprocal relationships may also exist between positive emotions (emotional well-being) and a broadening of one's thought-action repertoire (Fredrickson, 2001). It is therefore suggested that future research should examine evidence of causality between the conditions to flow and outcomes and possible reciprocal effects that may be present.

8.6 Conclusion

The present study highlights the likely benefits of experiencing the conditions to flow at work and employee mental health. Results revealed that the conditions to flow are likely predictive of flow, and mental health, and work involvement over and above the experience of flow. Additionally, it is suggested that future research should employ this newly developed scale of flow, which is not confounded with antecedents or outcomes, so that we can better understand the positive outcomes, if any, of experiencing flow. Lastly, given the findings of the present study, it is suggested that organisations should strive to create work environments that are more conducive to flow, to not only increase flow experiences at work, but to also increase employee mental health, work involvement, and realise the untapped potential of their employees.

Chapter 9
General Discussion and Conclusion

9.1 Overview

This thesis commenced with the suggestion that psychology needs to broaden its focus to include an understanding of what makes life worth living. Utilising flow theory, which is an understanding of positive experiences that represent people's lives at their fullest (Csikszentmihalyi, 1988b, 2002), the present thesis aimed to examine flow experiences at work and the conditions responsible for it. In the absence of an appropriate method to measure the flow experience at work, the present thesis developed and rigorously tested a scale to measure the conditions to flow and a scale to measure the flow experience in the workplace. In addition, the present thesis examined the possible antecedents and outcomes of experiencing flow at work. In this chapter, conclusions are drawn about the two developed scales and the potential contribution flow theory can have for the workplace. In addition, the contributions and implications of the present thesis, and directions for future research are provided.

9.2 General Discussion

Psychology's main focus on the treatment of mental illness has resulted in little advancement in making lives more productive, fulfilling, and nurturing of high talent (Seligman, 2002). Following this paradigm, industrial/organisational research is limited in that it is largely focused on the negative aspects of organisational life (Luthans & Church, 2002; Schaufeli & Bakker, 2004; Wright, 2003) and is biased towards benefiting management and organisations (Wright, 2003). While this focus has led to a greater understanding of important concepts such as job burnout and distress (Wright & Quick, 2009), the positive aspects of work and beneficial impact they may have on the creation of healthier and more meaningful lives remains unknown (Schaufeli & Bakker, 2004; Wright, 2003). Furthermore, in an increasingly competitive world, improving only the negative aspects of organisational life (e.g., job burnout) is unlikely to translate into organisational success (e.g., improved productivity and profit). To be successful today, organisations require a better understanding of the positive aspects of organisational life and know how to amplify them (Luthans & Youssef, 2007). One concept that may help better understand the positive aspects of work life is that of flow (Csikszentmihalyi, 1975). This concept is aligned with a number of relatively new emerging approaches, such as positive organisational behaviour (POB) and positive organisational scholarship (POS), that aim to redress the predominantly negative bias found in organisational research (Luthans et al., 2007; Youssef & Luthans, 2009). Although the concept of flow originated from research on structured activities that occupied people's leisure time (e.g., games, sports, and various art forms) the work context where much of our adult life is spent, is one such domain where flow may be most beneficial (Csikszentmihalyi, 1975). Having reviewed existing work motivation theories and related concepts in the present thesis, it is suggested that flow is likely a suitable concept that can usefully be applied in the workplace, and as it represents, arguably, the highest form of intrinsic motivation or peak performance, it likely has many unique benefits both at an individual and organisational level, over and above currently applied work motivation theories and related concepts. Furthermore, it is argued that flow theory should be considered a POB construct as it is theoretically driven, related to performance, state like, and provides a unique opportunity to better understand the positive experiences of work.

One limitation of flow theory in the work context is that the adequate measurement of this positive experience is lacking. The critical review of known flow measures, presented in this thesis, revealed that there are no currently known reliable and valid methods to measure the flow experience at work. This is because methods are generally confounded by antecedents and the outcome of flow and lack appropriate psychometric testing.

The present thesis aimed to address the above issue by: (a) reviewing which dimensions of flow theory should be seen as antecedents, the experiential state, or the outcome of flow; (b) developing a measure of both the conditions to flow and of the flow state using current recommended guidelines in scale development; and (c) providing evidence of reliability and validity for both scales. Additionally, unrelated to the above measurement issues, the present thesis also aimed to examine the possible antecedents to and the positive individual and organisational outcomes of experiencing flow at work.

9.2.1 Examination of the flow model.

As mentioned in Chapter 3, the originally identified dimensions of flow have proven to be robust across a wide variety of activities, classes, cultures, genders, and ages (Nakamura & Csikszentmihalyi, 2002). It has also been acknowledged that the dimensions of flow could potentially be categorised into either antecedents, the flow state, or the outcome of flow (Csikszentmihalyi, 1975, 1988a; Csikszentmihalyi et al., 2005; Fullagar et al., 2012; Nakamura & Csikszentmihalyi, 2002, 2009). Prior to scale development, it was considered necessary to carefully review which dimensions should be appropriately seen as antecedents of flow, as the flow state itself, or a possible outcome of flow, so as to not include possible confounding variables when examining the flow experience. This thesis provided a rationale for the idea that of the original dimensions of flow, the following should be seen as antecedents of flow: appropriate challenge, clear goals, feedback, and control. It was suggested that these four dimensions are likely required to enter into and remain in a flow state. The dimensions considered to represent the flow state include: the merging of action and awareness, deep concentration, loss of self-consciousness, and transformation of time. It was considered that these four dimensions best represent the actual flow experience as it occurs. Lastly, consistent with suggestions made by Csikszentmihalyi, (1975, 1988a), the autotelic experience, where an activity is seen as rewarding in and of itself, was considered a by-product or end result of flow.

9.2.2 Development of scales.

The Conditions to Flow Scale developed in Study 1 of Chapter 6 revealed a four-factor solution confirming the four conditions likely responsible for the flow experience: Appropriate Challenge, Clear Goals, Feedback, and Control. However, despite this finding, the Appropriate Challenge and Feedback factors did not contain items that were internally consistent. For the originally developed Flow Scale, not all of the expected dimensions were represented by distinct factors. The results revealed a three-factor solution, with two of the proposed dimensions being represented by distinct factors: Transformation of Time and Deep Concentration. The third interpreted factor, Order in Consciousness, was represented by a combination of items from the loss of self-consciousness and deep concentration dimensions of flow. These items all shared some common underlying meaning, in that, all items related to the experience where one's mind is in order: one is unable to neither think about oneself nor think about their worries or frustrations. Despite the presence of this Order in Consciousness factor, the items for this factor were not internally consistent. It was believed that negatively keyed items were largely responsible for the low internal consistency and unexpected factor solutions for the Flow Scale.

9.2.3 Revised scales.

As the originally developed scales were psychometrically inadequate, a number of revisions were made to improve the scales. Given the issues with negatively keyed items, and the unlikely need to guard against acquiescent, affirmation, or agreement bias style responding, these items were replaced with positively keyed items. Other revisions focused on improving item wording and the scales in general (see Chapter 6, pages 101-103, for details of revisions).

The revisions made resulted in improved psychometric properties of the scales. As expected, for the Conditions to Flow Scale, a four-factor solution was found, including the factors Appropriate Challenge, Clear Goals, Feedback, and Control. All factors had items that were highly internally consistent. For the Flow Scale a five-factor solution was found. The four dimensions of flow were represented by four distinct factors: Deep Concentration, Merging of Action and Awareness, Loss of Self-Consciousness, and Transformation of Time. In addition, some items developed for the Deep Concentration dimension were best represented by a separate factor, interpreted as an Order in Consciousness factor. All five factors for the Flow Scale had items that were highly internally consistent. Higher-order factor analyses also revealed the presence of a global factor for the Conditions to Flow Scale and a global factor for the Flow Scale. Both global factors had items that were also found to be highly internally consistent. Results therefore revealed the appropriateness of interpreting the Conditions to Flow Scale and Flow Scale on two levels: a narrow level representing either a dimension to or of the flow state, or a global level representing either the conditions to flow or flow state.

9.2.4 Validity of both scales.

Although it was found that the revised versions of both scales had good factorial validity and were found to be internally consistent, the researcher acknowledges that these findings may have been sample specific and not likely replicable in other samples or representative of the general population. Providing evidence of validity for any new scale often involves further research using new independent samples (Clark & Watson, 1995). Due to time and funding constraints, a comprehensive evaluation of both scales was not feasible. However, the present thesis was able to establish initial evidence of known group, discriminant, convergent, further factorial, and predictive validity, using two new independent samples.

9.2.4.1 Known group validity.

Using two occupational groups known to differ in the amount of flow experienced, small to moderate and statistically significant differences between groups were found for both the Conditions to Flow Scale and Flow Scale. The known high-flow group (managers, surgeons, and teachers) experienced more of the conditions considered responsible for flow and also experienced more flow than the known low-flow group (clerical workers). A possible explanation as to why only a small to moderate difference between groups for the conditions to flow was found, may be that the low-flow group occasionally experience high levels of certain conditions to flow that are easier to obtain (e.g., feedback) than other more complex conditions (e.g., appropriate challenge). Additionally, it is reasonable to expect that those in the high-flow group do not always experience high levels of certain conditions to flow (e.g., when trying to meet an impossible deadline, one is unlikely to feel appropriately challenged). Similarly, for the flow experience, a possible explanation as to why only a small to moderate difference between groups was found, may be that employees in the low-flow group experience flow some of the time at work or it may be that employees in the high-flow group do not experience flow at work as frequently as expected. The lack of a substantial group difference in flow may have been due to the criterion used to classify participants into either the low-flow or high-flow group. Although, previous research has found group differences in flow between occupations that differ in skill level, this criterion does not necessarily discriminate between employees who are less or more likely to experience flow. Nevertheless, the small to moderate differences between groups for both scales provide sufficient evidence of known group validity.

9.2.4.2 Discriminant validity.

Due to the nature of self-report measures, responding can often be influenced by other factors. One worthy influence is that of social desirable responding and it is therefore recommended that when developing a scale, one should ensure that scores are not influenced by this (DeVellis, 2003). Providing evidence of discriminant validity, it was revealed that both the Conditions to Flow and Flow Scales were not found to be largely associated with social desirable responding. This suggests that responses to both scales were not influenced by one's need to portray oneself in a more positive way as determined by society.

9.2.4.3 Convergent validity.

Providing evidence of convergent validity, flow, as expected, was found to have a large association with employee engagement. It was also revealed that although these constructs were related, only 29.2% of the variance was shared, indicating that they should be regarded as two distinct constructs. Further evidence suggesting that the two constructs should be considered distinct was revealed by the small to moderate associations between employee engagement and the Deep Concentration and Loss of Self-Consciousness subscales of flow. The finding that the two constructs overlap but are still distinct is consistent with the expectation that flow and employee engagement represent identification and vigour dimensions. However, employee engagement typically refers to a degree of engagement with one's work, whereas flow represents a peak form of engagement in a particular task.

9.2.4.4 Further factorial validity.

Confirmatory factor analysis, largely underutilised in scale development, is an important analytic technique that provides further information about the factor structures obtained in EFA (for the benefits of using CFA in scale development, see section 7.2.4, page 130; Noar, 2003). The previously found factor structures of the Conditions to Flow Scale and Flow Scale were confirmed in Chapter 7 using CFA. Furthermore, it was confirmed through CFA that the originally found factor structures were the best fitting models when tested against a series of other plausible models, providing further evidence of factorial validity beyond what was previously found in the initial EFA.

9.2.4.5 Predictive validity.

Evidence of predictive validity was also found for the Conditions to Flow Scale. The Conditions to Flow Scale was found to be a significant predictor of flow, mental health, and work involvement (job performance and turnover intentions). These findings suggest that experiencing the conditions to flow at work may have benefits at both an individual and organisational level, in that they may create flow experiences, improve mental health, and increase one's involvement with their work. However, no evidence of predictive validity was found for the Flow Scale as it failed to predict mental health or work involvement.

9.2.5 Antecedents of flow.

Structural equation modelling revealed that the score on the Conditions to Flow Scale (appropriate challenge, clear goals, control, and feedback) was found to be statistically significant predictor of flow. This suggests that being appropriately challenged, having clear goals, feeling in control, and knowing how well one is performing likely facilitates the flow experience at work.

9.2.6 Outcomes of flow.

An unexpected finding was that structural equation modelling did not reveal a unique relationship between the experience of flow and mental health and work involvement, over and above the conditions to flow. A possible explanation for this unexpected finding is that each of the conditions to flow on their own are likely to have a positive effect on the outcomes (i.e., mental health and work involvement) and they need not all be present for there to be an effect. However, flow is more difficult to experience than each of the conditions to flow, as a number of the conditions need to be present for the flow experience to occur. Therefore, flow may be less likely to have a positive effect. Another possible explanation is that flow may be experienced in brief frequent moments at work as it is activity specific and dependent on a number of situational factors and a constant dynamic balance between person and environment (i.e., appropriate challenge). These brief frequent experiences of flow may not be sufficient to have a positive effect over and above the conditions to flow, which are considered to be more enduring.

As detailed in Chapter 2, flow represents highly intrinsically rewarding moments that are found to be enjoyable, where action and psychic energy flow effortlessly (Csikszentmihalyi, 1975, 2002; Nakamura & Csikszentmihalyi, 2002, 2009). It attempts to understand the phenomenon of living fully and represents moments of superior functioning (Nakamura & Csikszentmihalyi, 2002). Although flow was not related to the outcomes in the present study over and above the conditions to flow, it is suggested that flow should be seen as a positive outcome in and of itself, as it represents one of the most positive human experiences were life is justified in the present (Csikszentmihalyi, 1975).

9.3 Thesis Contributions and Implications

9.3.1 Development of scales.

This thesis provided a critical review of currently available methods for measuring flow at work. Although it was found that some available assessments had established evidence of reliability and validity, upon a rigorous and detailed inspection of each assessment, it was revealed that there were many issues surrounding the measurement of the experiential state of flow. This critical review (Chapter 5) therefore cautions against the use of other existing assessments of flow, as they may not adequately capture the intended phenomenon of interest.

To address the above issue, this thesis developed a new scale to measure the flow experience and also a scale to measure the conditions to flow at work, through a series of studies. It is believed that of the flow scales that are suitable for the workplace, none have undergone such rigorous psychometric testing, refinement, and evaluation as the developed scale presented in this thesis. At the time of writing this thesis, the present researcher is also not aware of any scale that specifically aims to measure the conditions responsible for the flow experience.

The present researcher believes that the operationalisation of flow presented in this thesis is a more accurate representation of flow than other previous operationalisations (A. B. Bakker, 2005; Delle Fave & Massimini, 1988; S. A. Jackson, 1996; Martin & Jackson, 2008; Nielsen & Cleal, 2010), as it captures all the possible experiences originally described in flow theory (Csikszentmihalyi, 1975, 2002; Nakamura & Csikszentmihalyi, 2002, 2009), without confounding antecedents and outcomes. Furthermore, as found in Chapter 8, this thesis is the first to reveal the potential confounding effect that the antecedents to flow can have on the previously observed relationships between flow and other outcome measures. The findings of the present research are the first to highlight the need to employ a more valid measure of flow in future research.

A more accurate operationalisation of flow and valid measurement will further advance our understanding of flow experiences at work. Additionally, it is suggested that flow should now be recognised as a positive organisational behaviour (POB) construct as the previously remaining unmet POB inclusion criterion, measurability, has now been satisfied. Meeting the requirements for POB, flow, will likely receive greater attention in the workplace as POB constructs are seen to have greater application in the workplace (Luthans & Church, 2002).

At an organisational and management level, the Conditions to Flow Scale may serve those wanting to make workplaces more conducive to flow, and to possibly improve employee mental health and work involvement. Having employees complete the survey will enable an organisation/management to identify specific conditions conducive to flow that are perhaps lacking in their organisation. Conditions found to be lacking could then be addressed to improve workplace conditions, which may have positive effects for both the employee and organisation. The Flow Scale could serve as a tool to assess how often employees were thoroughly engrossed in their work. The scale could be administered as part of an ongoing monitoring process, or used to assess whether workplace changes, interventions, or newly administered programs either diminished or enhanced an employee's ability to experience flow at work.

9.3.2 Importance of flow theory to the workplace.

Business leaders are considered by Csikszentmihalyi (2003) to be among the most influential people in society, although trained to generate profit, many do not realise their other important responsibilities and the effects they can have on employees and society. The term *Good Business* described by Csikszentmihalyi (2003), in part, refers to the ability of leaders and organisations to contribute to employee happiness, meaning, and evolution. Given the positive benefits of experiencing the conditions to flow, it is suggested that flow theory may help to facilitate good business. In today's competitive corporate world where organisations are forced to do more with less, creating good business may give organisations that competitive edge as they realise the untapped potential of their employees. Additionally, creating good business is not only likely to have benefits for organisations, but also may lead to better employee and societal mental health.

The current research findings (Chapter 8) are believed to be the first to provide evidence of a relationship between the conditions to flow and complete mental health (i.e., low levels of mental illness symptoms and high levels of subjective well-being). The present researcher therefore suggests that flow theory may be a useful theoretical framework for creating workplaces that are not only more productive but also conducive to better employee mental health.

9.4 Limitations

A number of limitations need to be considered when interpreting the results of this thesis. Firstly, all participants were recruited using a convenience sampling approach, which may have resulted in the sample not being representative of the general population. In looking at the demographic characteristics in all samples, respondents were biased more towards females (an average across all samples of 75.6%). However, as the flow experience is considered universal and not gender specific (Nakamura & Csikszentmihalyi, 2002), it is anticipated that this gender imbalance would have minimal effects on the research findings. Additionally, in looking at occupation types, there were few respondents who were Labourers (an average across all samples of 1.1%) or Machinery Operators/Drivers (an average across all samples of 0.3%). It is possible that the study findings may not apply to these occupations. Conducting research online may be another contributing factor as to why the results may not be representative of the general population. For instance, those in rural communities with limited internet access may have been less likely or unable to participate.

Retrospective self-report measures used in the present thesis may have been potentially confounded by participants' inability to recall events or past experiences during the timeframe specified. However, for the Conditions to Flow Scale and Flow Scale, the two week time frame specified was not considered difficult for recalling past experiences and there were no reports of participants unable to recall events for both scales. Another limitation when using self-report measures is that responses may have been confounded by acquiescent or social desirable responding. However, according to Barnette (2000) as research was entirely voluntary, it was not anticipated that acquiescent responding would influence responses to scales used in the present research. Additionally, as shown in Chapter 7, social desirable responding was not found to be substantially associated with either of the two developed scales, indicating that it unlikely influenced scores on these two scales; whether or not it did for the other scales used in this research remains unknown.

A final limitation was that when examining the influence of the conditions to flow and flow at work on mental health, other factors from non-work domains (e.g., leisure) were not taken into account. Flow activities experienced in other domains may also have an effect on mental health. Additionally, individuals may compensate for a lack of flow activities at work by seeking out more flow activities in non-work domains. Therefore, it is suggested that possible confounding effects from non-work domains need to be taken into consideration when interpreting results.

9.5 Future Directions

Establishing evidence of reliability and validity is an ongoing process (Clark & Watson, 1995). Although the studies presented in this thesis examined and provided evidence of reliability and validity, further research is needed to confirm that the findings are not due to sampling artefacts. It is also suggested that future research examine the reliability and validity of the developed scales in occupations that differ from those found in the present study. Additionally, to provide further evidence of convergent and discriminant validity for both the developed scales, it is suggested that future research examine their associations with other, either similar concepts that were not examined in the present thesis, such as peak experience, peak performance, mindfulness, and absorption; or dissimilar, such as extraversion-introversion and agreeableness.

The experience of flow is not considered to be culture specific (Nakamura & Csikszentmihalyi, 2002). However, as only Australian residents were approached in the present research, it is suggested that future research should examine the reliability and validity of the two scales in non-Australian English speaking populations. It is possible that item wording may be interpreted differently among non-Australian English speaking populations, and this may have an effect on the psychometric properties of the scales.

In identifying the conditions likely to be responsible for flow, the present thesis focused on the dimensions described in flow theory, which are all task level conditions to flow. However, and particularly in the work context, it is suggested that future research should also examine other possible factors that are conducive to flow at work. For example, other factors have been found to be responsible for increased work motivation, including task meaningfulness/significance (Hackman & Oldham, 1976; Kahn, 1990), leadership (Macey & Schneider, 2008), and social relations with mangers (A. B. Bakker et al., 2007). These factors may also have an effect on how often flow is experienced at work.

Keller and Bless (2008) have previously stated that experimental designs have largely been neglected in research examining flow theory. It is suggested by the present researcher that further experimental designs be implemented to provide evidence of the causal assumptions found in the present thesis and existing literature on flow.

Lastly, given the likely positive individual and organisational benefits of experiencing the conditions to flow at work, revealed in this thesis, it is suggested that future research should examine effective ways to increase the conditions to flow at work. This may be achieved through the relatively newly emerging field of coaching psychology, defined as “the systematic application of behavioural science to the enhancement of life experience, work performance, and well-being for individuals, groups, and organisations who do not have clinically significant mental health issues or abnormal levels of distress”(Australian Psychological Society, 2011, "Coaching Psychology", para. 1). Coaching is largely focused on goal directed activity, where individuals select goals (either personal or professional) and work towards achieving them (Grant & Cavanagh, 2011; L. S. Green, Oades, & Grant, 2006). However, motivation theories are lacking in the coaching literature and are believed to be important for the future of coaching research and practice (Spence & Oades, 2011), particularly as they pertain to behaviour change (Overholser, 2005; Ryan & Deci, 2008) – “life coaching practice has run well ahead of related theory and research” (Spence & Grant, 2007, p. 186). Spence and Oades (2011) have recently proposed that SDT could usefully be applied in the coaching field as it provides a theoretical framework for understanding human motivation. It is suggested by the present researcher that flow theory, as it pertains to optimal human functioning and well-being, may also usefully be applied in the coaching field to bring about change among coachees.

9.6 Conclusion

In the absence of an appropriate known measure of flow or a measure of the conditions to flow suitable for the workplace, the present researcher developed two scales to measure both of these facets. Through a series of studies and scale revisions, both scales were found to have good psychometric properties. The research presented in this thesis provided evidence of reliability and content, known group, discriminant, convergent, factorial, and predictive validity. In addition, it was found that experiencing the conditions to flow at work may play a role in improving mental health and work involvement. It is hoped that through the rigorous development of these two scales, and having identified the conditions likely to facilitate flow, improve mental health, and work involvement, future research can proceed to better understand and create more productive and gratifying workplaces that are nurturing of high talent and mental health.

References

Ackerman, D. L., & Greenland, S. (2002). Multivariate meta-analysis of controlled drug studies for obsessive-compulsive disorder. *Journal of Clinical Psychopharmacology, 22*, 309-317.

Adlai-Gail, W. (1994). *Exploring the autotelic personality.* Unpublished doctoral dissertation, University of Chicago.

Adler, D. A., McLaughlin, T. J., Rogers, W. H., Chang, H., Lapitsky, L., & Lerner, D. (2006). Job performance deficits due to depression. *THe American Journal of Psychiatry, 163*, 1569-1576.

Anastasi, A. (1982). *Psychological testing*. New York: Macmillan.

Anderson, D. R., Crous, A. F., & Schepers, J. M. (1996). Flow and quality of work life in a diverse workforce. *Journal of Industrial Psychology, 22*(3), 13-20.

Anderson, I. M., & Tomenson, B. M. (1994). The efficacy of selective serotonin re-uptake inhibitors in depression: A meta-analysis of studies against tricyclic antidepressants. *Journal of Psychopharmacology, 8*, 238-249. doi: 10.1177/026988119400800407

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*, 411-423. doi: 10.1037/0033-2909.103.3.411

Atkins, C. W. (1990). *Comparative analysis of peak experience performance and non peak experience performance in professional actors and actresses.* Unpublished doctoral dissertation, United States International University

Australian Bureau of Statistics. (2007). National survey of mental health and well-being: Summary of results (ABS Cat No. 4326.0). Retrieved from http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/6AE6DA447F985FC2CA2574EA00122BD6/$File/43260_2007.pdf.

Australian Psychological Society. (2011). Coaching Psychology Interest Group Retrieved 13 December, 2011, from http://www.groups.psychology.org.au/igcp/

Avolio, B. J., & Luthans, F. (2006). *The high impact leader: Moments matter in accelerating authentic leadership development*. New York: McGraw-Hill.

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology, 34*, 2045-2068. doi: 10.1111/j.1559-1816.2004.tb02690.x

Bakker, A., Van Balkom, A. J., & Spinhoven, P. (2002). SSRIs vs. TCAs in the treatment of panic disorder: A meta-analysis. *Acta Psychiatrica Scandinavica, 106*, 163-167. doi: 10.1034/j.1600-0447.2002.02255.x

Bakker, A. B. (2005). Flow among music teachers and their students: The crossover of peak experiences. *Journal of Vocational Behavior, 66*, 26-44. doi: 10.1016/j.jvb.2003.11.001

Bakker, A. B. (2008). The work-related flow inventory: Construction and initial validation of the WOLF. *Journal of Vocational Behavior, 72*, 400-414. doi: 10.1016/j.jvb.2007.11.007

Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the job demands-resources model to predict burnout and performance. *Human Resource Management, 43*, 83-104. doi: 10.1002/hrm.20004

Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of Educational Psychology, 99*, 274-284. doi: 10.1037/0022-0663.99.2.274

Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress, 22*, 187-200. doi: 10.1080/02678370802393649

Bandelow, B., & Ruther, E. (2004). Treatment-resistant panic disorder. *CNS Spectrums, 9*, 725-739.

Barnette, J. J. (2000). Effects of stem and likert response option reversals on survey internal consistency: If you feel the need, there is a better alternative to using those negatively worded stems. *Educational and Psychological Measurement, 60*, 361-370. doi: 10.1177/00131640021970592

Bassi, M., & Delle Fave, A. (2004). Adolescence and the changing context of optimal experience in time: Italy 1986–2000. *Journal of Happiness Studies, 5*, 155-179. doi: 10.1023/B:JOHS.0000035914.66037.b5

Baumann, N. (2012). Autotelic Personality. In S. Engeser (Ed.), *Advances in flow research* (pp. 165-186). New York: Springer.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 10*, 238-246. doi: 10.1037/0033-2909.107.2.238

Bentler, P. M. (1995). *EQS: Structural equations program manual*. Encino, CA: Multivariate Software.

Bentler, P. M., & Chou, C.-P. (1987). Practical issues in structural modeling. *Sociological Methods & Research, 16*, 78-117. doi: 10.1177/0049124187016001004

Blanchard, W. H. (1969). Psychodynamic aspects of the peak experience. *The Psychoanalytic Review, 56*, 87-112.

Blanco, C., Schneier, F. R., Schmidt, A., Blanco-Jerez, C., Marshall, R. D., Sanchez-Lacay, A., & Liebowitz, M. R. (2003). Pharmacological treatment of social anxiety disorder: A meta-analysis. *Depression and Anxiety, 18*, 29-40. doi: 10.1002/da.10096

Bloch, C. (2002). Moods and quality of life. *Journal of Happiness Studies, 3*, 101-128. doi: 10.1023/A:1019647818216

Block, R. A., & Zakay, D. (1997). Prospective and retrospective duration judgments: A meta-analytic review. *Psychonomic Bulletin & Review, 4*, 184-197. doi: 10.3758/bf03209393

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: John Wiley & Sons.

Bollen, K. A., & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology, 20*, 115-140.

Boniface, M. R. (2000). Towards an understanding of flow and other positive experience phenomena within outdoor and adventurous activities. *Journal of Adventure Education & Outdoor Learning, 1*, 55-68. doi: 10.1080/14729670085200071

Bouville, G. (2009). *Organizational factors and Absenteeism or Intent to leave: A comparison between young and old age workers*. Paper presented at the Paper presented at the meeting of the 2nd Annual EuroMed Conference, University of Salerno.

Boyer, M. (1995). Serotonin uptake inhibitors are superior to imipramine and alprazolam in alleviating panic attacks: A meta-analysis. *International Clinical Psychopharmacology, 10*, 45-49. doi: 10.1097/00004850-199503000-00006

Bozeman, D. P., & Perrewé, P. L. (2001). The effect of item content overlap on organizational commitment questionnaire-turnover cognitions relationships. *Journal of Applied Psychology, 86*, 161-173. doi: 10.1037/0021-9010.86.1.161

Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality, 54*, 106-148. doi: 10.1111/j.1467-6494.1986.tb00391.x

Bryce, J., & Haworth, J. (2002). Wellbeing and flow in sample of male and female office workers. *Leisure Studies, 21*, 249-263. doi: 10.1080/0261436021000030687

Butler, G., Fennell, M., Robson, P., & Gelder, M. (1991). Comparison of behavior therapy and cognitive behavior therapy in the treatment of generalized anxiety disorder. *Journal of Consulting and Clinical Psychology, 59*, 167-175. doi: 10.1037/0022-006X.59.1.167

Byrne, B. M. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Byrne, C., MacDonald, R., & Carlton, L. (2003). Assessing creativity in musical compositions: Flow as an assessment tool. *British Journal of Music Education, 20*, 277-290. doi: 10.1017/S0265051703005448

Cameron, K. S., & Caza, A. (2003). *Contributions to the discipline of positive organizational scholarship*. School of Business. University of Michigan Ann Arbor, Michigan.

Carli, M., Delle Fave, A., & Massimini, F. (1988). The quality of experience in the flow channels: Comparison of Italian and U.S. students. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 288-306). New York: Cambridge University Press.

Ceja, L., & Navarro, J. (2009). Dynamics of flow: A nonlinear perspective. *Journal of Happiness Studies, 10*, 665-684. doi: 10.1007/s10902-008-9113-6

Ceja, L., & Navarro, J. (2011). Dynamic patterns of flow in the workplace: Characterizing within-individual variability using a complexity science approach. *Journal of Organizational Behavior, 32*, 627-651. doi: 10.1002/job.747

Chen, C.-C., & Chiu, S.-F. (2009). The mediating role of job involvement in the relationship between job characteristics and organizational citizenship behavior. *The Journal of Social Psychology, 149*, 474-494. doi: 10.3200/SOCP.149.4.474-494

Chen, H. (2006). Flow on the net-detecting Web users' positive affects and their flow states. *Computers in Human Behavior, 22*, 221-233. doi: 10.1016/j.chb.2004.07.001

Chen, H., Wigand, R. T., & Nilan, M. S. (1999). Optimal experience of Web activities. *Computers in Human Behavior, 15*, 585-608. doi: 10.1016/S0747-5632(99)00038-2

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*, 309-319. doi: 10.1037/1040-3590.7.3.309

Clarke, S. G., & Haworth, J. T. (1994). 'Flow' experience in the daily lives of sixth-form college students. *British Journal of Psychology, 85*, 511-523. doi: 10.1111/j.2044-8295.1994.tb02538.x

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale: NJ: Lawrence Erlbaum Associates.

Cohn, M. A., & Fredrickson, B. L. (2010). In search of durable positive psychology interventions: Predictors and consequences of long-term positive behavior change. *The Journal of Positive Psychology, 5*, 355-366. doi: 10.1080/17439760.2010.508883

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cook-Greuter, S. (2000). Mature ego development: A gateway to ego transcendence? *Journal of Adult Development, 7*, 227-240. doi: 10.1023/a:1009511411421

Cote, J. A., & Buckley, R. (1987). Estimating trait, method, and error variance: Generalizing across 70 construct validation studies. *Journal of Marketing Research, 24*, 315-318.

Council, J. R., Kirsch, I., & Hafner, L. P. (1986). Expectancy versus absorption in the prediction of hypnotic responding. *Journal of Personality and Social Psychology, 50*, 182-189. doi: 10.1037/0022-3514.50.1.182

Csikszentmihalyi, M. (1965). *Artistic problems and their solution: An exploration of creativity in the arts.* (Doctoral dissertation, University of Chicago). Retrieved from http://disexpress.umi.com/.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (1978). Intrinsic rewards and emergent motivation. In M. R. Lepper & D. Greene (Eds.), *The hidden costs of reward* (pp. 205-216). New York: Erlbaum.

Csikszentmihalyi, M. (1981). Leisure and socialization. *Social Forces, 60*, 332-340.

Csikszentmihalyi, M. (1988a). The flow experience and its significance for human psychology. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 15-36). New York: Cambridge University Press.

Csikszentmihalyi, M. (1988b). Introduction. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 3-14). New York: Cambridge University Press.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row Publishers.

Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. New York: Basic Books.

Csikszentmihalyi, M. (1999). If we are so rich, why aren't we happy? *American Psychologist, 54*, 821-827. doi: 10.1037/0003-066X.54.10.821

Csikszentmihalyi, M. (2002). *Flow: The classic work on how to achieve happiness*. London: The Random House Group Ltd.

Csikszentmihalyi, M. (2003). *Good business: Leadership, flow and the making of meaning*. New York: Penguin Books.

Csikszentmihalyi, M., Abuhamdeh, S., & Nakamura, J. (2005). Flow. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence of motivation* (pp. 598-608). New York: Guilford.

Csikszentmihalyi, M., & Csikszentmihalyi, I. S. (1988). Introduction to part IV. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 251-265). New York: Cambridge University Press.

Csikszentmihalyi, M., & Larson, R. (1984). *Being adolescent*. New York: Basic Books.

Csikszentmihalyi, M., & Larson, R. (1987). Validity and reliability of the experience-sampling method. *The Journal of Nervous and Mental Disease, 175*, 526-536.

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*, 815-822. doi: 10.1037/0022-3514.56.5.815

Csikszentmihalyi, M., & Nakamura, J. (2010). Effortless attention in everyday life: A systematic phenomenology. In B. Bruya (Ed.), *Effortless attention: A new perspective in the cognitive science of attention and action* (pp. 179-190). Cambridge, Massachusetts: MIT Press.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure*. Cambridge, UK: Cambridge University Press.

Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods, 1*, 16-29. doi: 10.1037/1082-989X.1.1.16

Dalal, R. S., Brummel, B. J., Wee, S., & Thomas, L. L. (2008). Defining employee engagement for productive research and practice. *Industrial and Organizational Psychology, 1*, 52-55. doi: 10.1111/j.1754-9434.2007.00008.x

De Varo, J., Li, R., & Brookshire, D. (2007). Analysing the job characteristics model: New support from a cross-section of establishments. *The International Journal of Human Resource Management, 18*, 986-1003. doi: 10.1080/09585190701321211

Dean, B. M. (2009). *Optimal experience in relationships, activities, and beyond: Connecting flow with self-expansion.* (Doctoral dissertation). Retrieved from http://scholars.indstate.edu/bitstream/10484/902/1/Dean,%20Brandy.pdf

deCharms, R. (1976). *Enhancing motivation: Change in the classroom*. Oxford, England: Irvington.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (Eds.). (2002). *Handbook of self-determination research*. New York: The University of Rochester Press.

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin, 27*, 930-942. doi: 10.1177/0146167201278002

Deitcher, J. (2011). *Facilitating flow at work: Analysis of the dispositional flow scale-2 in the workplace.* Unpublished masters thesis, Saint Mary's Univeristy.

Delespaul, P. A. E. G., Reis, H. T., & DeVries, W. (2004). Ecological and motivational determinants of activation: Studying compared to sports and watching TV. *Social Indicators Research, 67*, 129-143. doi: 10.1023/B:SOCI.0000007337.94184.e5

Delle Fave, A., & Bassi, M. (2003). Italian adolescents and leisure: The role of engagement and optimal experience. *New Directions for Child and Adolescent Development, 2003*(99), 79-94. doi: 10.1002/cd.68

Delle Fave, A., & Massimini, F. (1988). Modernization and the changing contexts of flow in work and leisure. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 193-213). New York: Cambridge University Press.

Delle Fave, A., Massimini, F., Bassi, M., & Fave, A. D. (2011). Instruments and methods in flow research. *Psychological selection and optimal experience across cultures* (Vol. 2, pp. 59-87): Springer Netherlands.

Demerouti, E. (2006). Job characteristics, flow, and performance: The moderating role of conscientiousness. *Journal of Occupational Health Psychology, 11*, 266-280. doi: 10.1037/1076-8998.11.3.266

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*, 499-512. doi: 10.1037/0021-9010.86.3.499

DeVellis, R. F. (2003). *Scale development: Theory and applications* (2nd ed.). London: Sage Publications.

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34-43. doi: 10.1037/0003-066X.55.1.34

Diener, E., & Diener, C. (1996). Most people are happy. *Psychological Science, 7*, 181-185. doi: 10.1111/j.1467-9280.1996.tb00354.x

Dirk, v. D. (2004). The construct validity of Ryff's scales of psychological well-being and its extension with spiritual well-being. *Personality and Individual Differences, 36*, 629-643. doi: 10.1016/s0191-8869(03)00122-3

Dodson, K. J. (1996). Peak experiences and mountain biking: Incorporating the bike into the extended self. *Advances in Consumer Research 23*, 317-322.

Downey, R. G., & King, C. V. (1998). Missing data in Likert ratings: A comparison of replacement methods. *The Journal of General Psychology, 125*, 175-191. doi: 10.1080/00221309809595542

Duckworth, A. L., Steen, T. A., & Seligman, M. E. P. (2005). Positive psychology in clinical practice. *Annual Review of Clinical Psychology, 1*, 629-651. doi: 10.1146/annurev.clinpsy.1.102803.144154

Eddy, K. T., Dutra, L., Bradley, R., & Westen, D. (2004). A multidimensional meta-analysis of psychotherapy and pharmacotherapy for obsessive-compulsive disorder. *Clinical Psychology Review, 24*, 1011-1030. doi: 10.1016/j.cpr.2004.08.004

Ehrnrooth, E., Zacharia, R., Svendsen, G., Jorgensen, M. M., Yishay, M., Sorensen, B. S., . . . von der Maase, H. (2002). Increased Thymidylate Synthase mRNA Concentration in Blood Leukocytes following an Experimental Stressor. *Psychotherapy and Psychosomatics, 2002*, 97-103. doi: 10.1159/000049352

Eisenberger, R., Jones, J. R., Stinglhamber, F., Shanock, L., & Randall, A. T. (2005). Flow experiences at work: For high need achievers alone? *Journal of Organizational Behavior, 26*, 755-775. doi: 10.1002/job.337

Ellis, G. D., Voelkl, J. E., & Morris, C. (1994). Measurement and analysis issues with explanation of variance in daily experience using the flow. *Journal of Leisure Research, 26*, 337-356.

Engeser, S., & Schiepe-Tiska, A. (2012). Historical lines and an overview of current research on flow. In S. Engeser (Ed.), *Advances in flow research* (pp. 1-22). New York: Springer.

Erez, M., & Zidon, I. (1984). Effect of goal acceptance on the relationship of goal difficulty to performance. *Journal of Applied Psychology, 69*, 69-78. doi: 10.1037/0021-9010.69.1.69

Fedoroff, I. C., & Taylor, S. (2001). Psychological and pharmacological treatments of social phobia: A meta-analysis. *Journal of Clinical Psychopharmacology, 21*, 311-324.

Field, A. (2005). *Discovering statistics using SPSS* (2nd ed.). London: Sage Publications.

Forest, J., Mageau, G. A., Sarrazin, C., & Morin, E. M. (2011). “Work is my passion”: The different affective, behavioural, and cognitive consequences of harmonious and obsessive passion toward work. *Canadian Journal of Administrative Sciences / Revue Canadienne des Sciences de l'Administration, 28*, 27-40. doi: 10.1002/cjas.170

Fredrickson, B. L. (1998). What good are positive emotions. *Review of General Psychology, 2*, 300-319. doi: 10.1037/1089-2680.2.3.300

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218-226. doi: 10.1037/0003-066X.56.3.218

Fredrickson, B. L., & Dutton, J. E. (2008). Unpacking positive organizing: Organizations as sites of individual and group flourishing. *The Journal of Positive Psychology, 3*, 1-3.

Fried, Y., & Ferris, G. R. (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology, 40*, 287-322. doi: 10.1111/j.1744-6570.1987.tb00605.x

Fullagar, C., Downey, R. G., Wefald, A. J., & Rupayana, D. D. (2006). Positive psychology applied to work. In S. G. Rogelberg (Ed.), Encyclopedia of industrial/organizational psychology (pp. 631-634). Thousand Oaks, CA: Sage. Retrieved from http://sage-ereference.com/view/organizationalpsychology/n259.xml

Fullagar, C., & Kelloway, E. K. (2009). 'Flow' at work: An experience sampling approach. *Journal of Occupational and Organizational Psychology, 82*, 595-615. doi: 10.1348/096317908X357903

Fullagar, C., Knight, P. A., & Sovern, H. S. (2012). Challenge/skill balance, flow, and performance anxiety. *Applied Psychology*. doi: 10.1111/j.1464-0597.2012.00494.x

Gable, R. K., & Wolf, M. B. (1993). *Instrument development in the affective domain: Measuring attitudes and values in corporate and school settings* (2nd ed.). Boston: Kluner Academic.

Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*, 331-362. doi: 10.1002/job.322

Gagné, M., Koestner, R., & Zuckerman, M. (2000). Facilitating acceptance of organizational change: The importance of self-determination. *Journal of Applied Social Psychology, 30*, 1843-1852. doi: 10.1111/j.1559-1816.2000.tb02471.x

Gagné, M., Ryan, R. M., & Bargmann, K. (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology, 15*, 372-390. doi: 10.1080/714044203

Garfield, S. L. (1996). Some problems associated with "validated" forms of psychotherapy. *Clinical Psychology: Science and Practice, 3*, 218-229. doi: 10.1111/j.1468-2850.1996.tb00073.x

Gignac, G. E. (2007). Multi-factor modeling in individual differences research: Some recommendations and suggestions. *Personality and Individual Differences, 42*, 37-48. doi: 10.1016/j.paid.2006.06.019

Gorsuch, R. L. (1990). Common factor analysis versus component analysis: Some well and little known facts. *Multivariate Behavioral Research, 25*, 33-39. doi: 10.1207/s15327906mbr2501_3

Gorsuch, R. L. (1997). Exploratory factor analysis: Its role in item analysis. *Journal of Personality Assessment, 68*, 532 - 560. doi: 10.1207/s15327752jpa6803_5

Grant, A. M., & Cavanagh, M. (2011). Coaching and positive psychology. In K. M. Sheldon, T. B. Kashdan & M. F. Steger (Eds.), *Designing positive psychology: Taking stock and moving forward* (pp. 293-309). New York: Oxford University Press.

Green, J. P., & Lynn, S. J. (2010). Hypnotic responsiveness: Expectancy, attitudes, fantasy proneness, absorption, and gender. *International Journal of Clinical and Experimental Hypnosis, 59*, 103-121. doi: 10.1080/00207144.2011.522914

Green, L. S., Oades, L. G., & Grant, A. M. (2006). Cognitive-behavioral, solution-focused life coaching: Enhancing goal striving, well-being, and hope. *The Journal of Positive Psychology, 1*, 142-149. doi: 10.1080/17439760600619849

Greenberg, J. (2008). Understanding the vital human quest for self-esteem. *Perspectives on Psychological Science, 3*, 48-55. doi: 10.1111/j.1745-6916.2008.00061.x

Guastello, S. J., Johnson, E. A., & Rieke, M. L. (1999). Nonlinear dynamics of motivational flow. *Nonlinear Dynamics, Psychology, and Life Sciences, 3*, 259-273. doi: 10.1023/a:1021830917726

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology, 60*, 159-170. doi: 10.1037/h0076546

Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance, 16*, 250-279. doi: 10.1016/0030-5073(76)90016-7

Hackman, J. R., Oldham, G. R., Janson, R., & Purdy, K. (1975). A new strategy for job enrichment. *California Management Review, 17*, 57-71.

Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology, 43*, 495-513. doi: 10.1016/j.jsp.2005.11.001

Hall, R. J., Snell, A. F., & Foust, M. S. (1999). Item parceling strategies in SEM: Investigating the subtle effects of unmodeled secondary constructs. *Organizational Research Methods, 2*, 233-256. doi: 10.1177/109442819923002

Han, S. (1988). The relationship between life satisfaction and flow in elderly Korean immigrants. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 138-149). New York: Cambridge University Press.

Harmison, R. J. (2006). Peak performance in sport: Identifying ideal performance states and developing athletes' psychological skills. *Professional Psychology: Research and Practice, 37*, 233-243. doi: 10.1037/0735-7028.37.3.233

Harung, H. S. (2012). Illustrations of peak experiences during optimal performance in world-class performers: Integrating eastern and western Insights. *Journal of Human Values, 18*, 33-52. doi: 10.1177/097168581101800104

Harung, H. S., Heaton, D. P., Graff, W. W., & Alexander, C. N. (1996). Peak performance and higher states of consciousness: A study of world-class performers. *Journal of Managerial Psychology, 11*, 3-23. doi: 10.1108/02683949610117580

Havran, H., Visser, D., & Crous, F. (2003). The internal career orientation of permanent and contracting information technology staff. *SA Journal of Industrial Psychology, 29*(3), 53-60.

Hayduk, L. A. (1987). *Structural equation modeling with LISREL: Essentials and advances.* Baltimore, MD: The John Hopkins University Press.

Hektner, J. M. (1996). *Exploring optimal personality development: A longitudinal study of adolescents.* Unpublished doctoral dissertation, University of Chicago.

Hektner, J. M., Schmidt, J., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life*. Thousand Oaks, CA: Sage.

Hickie, I. B., Davenport, T. A., Scott, E. M., Hadzi-Pavlovic, D., Naismith, S. L., & Koschera, A. (2001). Unmet need for recognition of common mental disorders in Australian general practice. *The Medical Journal of Australia, 175*, S18-24.

Hoffman, E. (2003). Peak-experiences in Japanese youth. *Japanese Journal of Humanistic Psychology, 21*, 112-121.

Hoffman, E., Iversen, V., & Ortiz, F. (2010). Peak experiences among Norwegian youth. *Nordic Psychology, 62*, 67-76. doi: 10.1027/1901-2276/a000022

Hoffman, E., & Ortiz, F. (2009). Youthful peak experiences in cross-cultural perspective: Implications for educators and counselors. In L. Francis, D. Scott, M. de Souza & J. Norman

(Eds.), *The international handbook of education for spirituality, care & well-being* (pp. 469-490). New York: Spring.

Holtgraves, T. (2004). Social desirability and self-reports: Testing models of socially desirable responding. *Personality and Social Psychology Bulletin, 30*, 161-172. doi: 10.1177/0146167203259930

Hsu, C.-L., & Lu, H.-P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information and Management, 41*, 853-868. doi: 10.1016/j.im.2003.08.014

Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal 6*, 1-55. doi: 10.1080/10705519909540118

Huang, D. T. (2008). *A new tool to measure the relationship between health-related quality of life and workforce productivity.* Unpublished doctoral dissertation, Georgia Institute of Technology.

Ilardi, B. C., Leone, D., Kasser, T., & Ryan, R. M. (1993). Employee and supervisor ratings of motivation: Main effects and discrepancies associated with job satisfaction and adjustment in a factory setting. *Journal of Applied Social Psychology, 23*, 1789-1805. doi: 10.1111/j.1559-1816.1993.tb01066.x

Insel, T. R., & Scolnick, E. M. (2006). Cure therapeutics and strategic prevention: Raising the bar for mental health research. *Molecular Psychiatry, 11*, 11-17. doi: 10.1038/sj.mp.4001777

Jackson, D. L., Gillaspy, J. A. J., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychological Methods, 14*, 6-23. doi: 10.1037/a0014694

Jackson, D. N. (1984). Personality research form manual (3rd Ed.). Port Huron, MI: Sigma Assessment Systems.

Jackson, S. A. (1992). Athletes in flow: A qualitative investigation of flow states in elite figure skaters. *Journal of Applied Sport Psychology, 4*, 161-180. doi: 10.1080/10413209208406459

Jackson, S. A. (1995). Factors influencing the occurrence of flow state in elite athletes. *Journal of Applied Sport Psychology, 7*, 138-166. doi: 10.1080/10413209508406962

Jackson, S. A. (1996). Toward a conceptual understanding of the flow experience in elite athletes. *Research Quarterly for Exercise and Sport, 67*, 76-90.

Jackson, S. A., & Eklund, R. C. (2002). Assessing flow in physical activity: The flow state scale-2 and dispositional flow scale-2. *Journal of Sport & Exercise Psychology, 24*, 133-150.

Jackson, S. A., & Eklund, R. C. (2004). *The flow scales manual*. Morgantown, West Virginia: Fitness Information Technology, Inc.

Jackson, S. A., & Marsh, H. W. (1996). Development and validation of a scale to measure optimal experience: The flow state scale. *Journal of Sport & Exercise Psychology, 18*, 17-35.

Jackson, S. A., Thomas, P. R., Marsh, H. W., & Smethurst, C. J. (2001). Relationships between flow, self-concept, psychological skills, and performance. *Journal of Applied Sport Psychology, 13*, 129-153. doi: 10.1080/104132001753149865

Jamieson, G. A. (2005). The modified tellegen absorption scale: A clearer window on the structure and meaning of absorption. *Australian Journal of Clinical and Experimental Hypnosis, 33*, 119-139.

Joffe, R., Sokolov, S., & Streiner, D. (1996). Antidepressant treatment of depression: A metaanalysis. *The Canadian Journal of Psychiatry, 41*, 613-616.

Jones, F., & Fletcher, B. (2003). Job control, physical health and psychological well-being. In M. J. Schabracq, J. A. M. Winnubst & C. L. Cooper (Eds.), *The handbook of work and health psychology (2nd ed.)* (pp. 121-142). West Sussex, England: John Wiley and Sons Ltd.

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal, 33*, 692-724.

Kasper, S., Fuger, J., & Moller, H. J. (1992). Comparative efficacy of antidepressants. *Drugs, 43*, 11-23.

Kasser, T., Davey, J., & Ryan, R. M. (1992). Motivation and employee-supervisor discrepancies in a psychiatric vocational rehabilitation setting. *Rehabilitation Psychology, 37*, 175-188. doi: 10.1037/h0079104

Keller, J., & Bless, H. (2008). Flow and regulatory compatibility: An experimental approach to the flow model of intrinsic motivation. *Personality and Social Psychology Bulletin, 34*, 196-209. doi: 10.1177/0146167207310026

Kessler, R. C., Ames, M., Hymel, P. A., Loeppke, R., McKenas, D. K., Richling, D. E., . . . Ustun, T. B. (2004). Using the WHO health and work performance questionnaire (HPQ) to evaluate the indirect workplace costs of illness. *Journal of Occupational and Environmental Medicine, 46*, S23-S37.

Kessler, R. C., Barber, C., Beck, A., Berglund, P. M., Cleary, P. D., McKenas, D., . . . Wang, P. (2003). The World Health Organization health and work performance questionnaire (HPQ). *Journal of Occupational and Environmental Medicine, 45*, 156-174.

Kessler, R. C., Berglund, P. A., Bruce, M. L., Koch, J. R., Laska, E. M., Leaf, J. P., . . . Wang, P. S. (2001). The prevalence and correlates of untreated serious mental illness. *Health Services Research, 36*, 987-1007.

Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior, 43*, 207-222.

Keyes, C. L. M. (2003). Complete mental health: An agenda for the 21st century. In C. L. M. Keyes & J. Haidt (Eds.), *Flourishing: Positive psychology and the life well-lived* (pp. 293-312). Washington, DC: American Psychological Society.

Keyes, C. L. M. (2004). The nexus of cardiovascular disease and depression revisited: The complete mental health perspective and the moderating role of age and gender. *Aging & Mental Health, 8*, 266-274. doi: 10.1080/13607860410001669804

Keyes, C. L. M. (2005a). Chronic physical conditions and aging: Is mental health a potential protective factor? *Ageing International, 30*, 88-104. doi: 10.1007/bf02681008

Keyes, C. L. M. (2005b). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology, 73*, 539-548. doi: 10.1037/0022-006X.73.3.539

Keyes, C. L. M. (2006). Subjective well-being in mental health and human development research worldwide: An introduction. *Social Indicators Research, 77*(1), 1-10. doi: 10.1007/s11205-005-5550-3

Keyes, C. L. M. (2007a). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist, 62*, 95-108. doi: 10.1037/0003-066X.62.2.95

Keyes, C. L. M. (2007b). Towards a mentally flourishing society: Mental health promotion, not cure. *Journal of Public Mental Health, 6*(2), 4-7.

Keyes, C. L. M. (2009). The nature and importance of positive mental health in America's adolescents. In M. Furlong, R. Gilman & E. Huebner (Eds.), *Handbook of positive psychology in schools* (pp. 9-23). New York: Routledge.

Keyes, C. L. M., & Annas, J. (2009). Feeling good and functioning well: Distinctive concepts in ancient philosophy and contemporary science. *The Journal of Positive Psychology, 4*(3), 197-201. doi: 10.1080/17439760902844228

Keyes, C. L. M., Dhingra, S. S., & Simoes, E. J. (2010). Change in level of positive mental health as a predictor of future risk of mental illness. *American Journal of Public Health, 100*, 2366-2371. doi: 10.2105/ajph.2010.192245

Keyes, C. L. M., & Grzywacz, J. G. (2005). Health as a complete state: The added value in work performance and healthcare costs. *Journal of Occupational and Environmental Medicine, 47*, 523-532. doi: 10.1097/01.jom.0000161737.21198.3a

Keyes, C. L. M., & Lopez, S. J. (2002). Toward a science of mental health. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 45-59). New York: Oxford University Press.

Keyes, C. L. M., Myers, J. M., & Kendler, K. S. (2010). The structure of the genetic and environmental influences on mental well-being. *American Journal of Public Health, 100*, 2379-2384. doi: 10.2105/ajph.2010.193615

Kimiecik, J. C., & Stein, G. L. (1992). Examining flow experiences in sport contexts: Conceptual issues and methodological concerns. *Journal of Applied Sport Psychology, 4*, 144-160. doi: 10.1080/10413209208406458

Kline, P. (1993). *The handbook of psychological testing*. London: Routledge.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: The Guilford Press.

Larson, R., & Verma, S. (1999). How children and adolescents spend time across the world: work, play and developmental opportunities. *Psychological Bulletin, 25*, 701-736.

Laski, M. (1962). *Ecstasy: A study of some secular and religious experiences*. Bloomington, Indiana: University Press.

Leach, D. (1963). *Meaning and correlates of peak experience.* Unpublished doctoral dissertation, University of Florida.

LeFevre, J. (1988). Flow and the quality of experience during work and leisure. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 307-318). New York: Cambridge University Press.

Lerner, D., & Henke, R. M. (2008). What does research tell us about depression, job performance, and work productivity? *Journal of Occupational and Environmental Medicine, 50*, 401-410 doi: 10.1097/JOM.0b013e31816bae50

Linley, P., A, Joseph, S., Harrington, S., & Wood, A. M. (2006). Positive psychology: Past, present, and (possible) future. *The Journal of Positive Psychology, 1*, 3-16. doi: 10.1080/17439760500372796

Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioural treatment: Confirmation from meta-analysis. *American Psychologist, 48*, 1181-1209. doi: 10.1037/0003-066X.48.12.1181

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*, 1198-1202.

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice Hall.

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*, 705-717. doi: 10.1037/0003-066X.57.9.705

Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current Directions in Psychological Science, 15*, 265-268. doi: 10.1111/j.1467-8721.2006.00449.x

Lovibond, S. H., & Lovibond, P. F. (1995). Manual for the depression anxiety stress scales (2nd. Ed.). Sydney, Australia: Psychology Foundation.

Lowis, M. J. (2002). Music as a trigger for peak experiences among a college staff population. *Creativity Research Journal, 14*, 351-359. doi: 10.1207/s15326934crj1434_6

Luthans, F. (2002). The need for and meaning of positive organizational behavior. *Journal of Organizational Behavior, 23*, 695-706. doi: 10.1002/job.165

Luthans, F., & Church, A. H. (2002). Positive organizational Behavior: Developing and managing psychological strengths *The Academy of Management Executive 16*, 57-75.

Luthans, F., & Youssef, C. M. (2007). Emerging positive organizational behavior. *Journal of Management, 33*, 321-349. doi: 10.1177/0149206307300814

Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*. Oxford, UK: Oxford University Press.

Macey, W. H., & Schneider, B. (2008). The meaning of employee engagement. *Industrial and Organizational Psychology, 1*, 3-30. doi: 10.1111/j.1754-9434.2007.0002.x

Maddux, J. E. (2002). Stopping the "madness": Positive psychology and the deconstruction of the illness ideology and the DSM. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 13-25). New York: Oxford University Press.

Maharishi, M. Y. (1963). *Science of being and art of living*. New York: Penguin Books.

Martin, A., & Jackson, S. (2008). Brief approaches to assessing task absorption and enhanced subjective experience: Examining ‘short’ and ‘core’ flow in diverse performance domains. *Motivation and Emotion, 32*(3), 141-157. doi: 10.1007/s11031-008-9094-0

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review Psychology, 52*, 397-422. doi: 10.1146/annurev.psych.52.1.397

Maslow, A. (1968). *Toward a psychology of being*. New York: Van Nostrand.

Maslow, A. (1970). *Religions, values, and peak experiences*. New York: Viking.

Maslow, A. (1971). The farther reaches of human nature.

Maslow, A. (1996). The health implications of peaks-to-completion. In E. Hoffman (Ed.), *Future visions: The unpublished papers of Abraham Maslow* (pp. 39-41). Thousand Oaks, California: Sage.

Massimini, F., & Carli, M. (1988). The systematic assessment of flow in daily experience. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 266-287). New York: Cambridge University Press.

Massimini, F., Csikszentmihalyi, M., & Massimo, C. (1987). The monitoring of optimal experience: A tool for psychiatric rehabilitation. *Journal of Nervous and Mental Disease, 175*, 545-549. doi: 10.1097/00005053-198709000-00006

Mathews, D. R. (2010). *Performance management: A comparative analysis of peak experience performance and non-peak experience performance in business leaders.* Unpublished doctoral dissertation, Capella University.

Mauno, S., Kinnunen, U., & Ruokolainen, M. (2007). Job demands and resources as antecedents of work engagement: A longitudinal study. *Journal of Vocational Behavior, 70*, 149-171. doi: 10.1016/j.jvb.2006.09.002

McDonald, R. P. (1985). *Factor analysis and related methods*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Mitchell, A. J., & Selmes, T. (2007). Why don't patients take their medicine? Reasons and solutions in psychiatry. *Advances in Psychiatric Treatment, 13*, 336-346. doi: 10.1192/apt.bp.106.003194

Mitchell, R. G., Jr. (1988). Sociological implications of the flow experience. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 36-59). New York: Cambridge University Press.

Mitte, K. (2005). A meta-analysis of the efficacy of psycho- and pharmacotherapy in panic disorder with and without agoraphobia. *Journal of Affective Disorders, 88*, 27-45. doi: 10.1016/j.jad.2005.05.003

Mitte, K., Noack, P., Steil, R., & Hautzinger, M. (2005). A meta-analytic review of the efficacy of drug treatment in generalized anxiety disorder. *Journal of Clinical Psychopharmacology, 25*, 141-150.

Moneta, G. B., & Csikszentmihalyi, M. (1996). The effect of perceived challenges and skills on the quality of subjective experience. *Journal of Personality, 64*, 275-310. doi: 10.1111/j.1467-6494.1996.tb00512.x

Morgan, S. J. (2005). Joblab: A study into the experience of teaching. Copthorne: Crosslight Management Ltd.

Morgeson, F. P., Delaney-Klinger, K., & Hemingway, M. A. (2005). The importance of job autonomy, cognitive ability, and job-related skill for predicting role breadth and job performance. *Journal of Applied Psychology, 90*, 399-406. doi: 10.1037/0021-9010.90.2.399

Munoz, R. F., Hollon, S. D., McGrath, E., Rehm, L. P., & VandenBos, G. R. (1994). On the AHCPR depression in primary care guidelines. *American Psychologist, 49*, 42-61. doi: 10.1037/0003-066X.49.1.42

Nadon, R., Hoyt, I. P., Register, P. A., & Kihlstom, J. F. (1991). Absorption and hypnotizability: Context effects reexamined. *Journal of Personality and Social Psychology, 60*, 144-153. doi: 10.1037/0022-3514.60.1.144

Nakamura, J., & Csikszentmihalyi, M. (2002). The concept of flow. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 89-105). New York: Oxford University Press.

Nakamura, J., & Csikszentmihalyi, M. (2009). Flow theory and research. In S. J. Lopez & C. R. Synder (Eds.), *Handbook of positive psychology* (pp. 195-206). New York: Oxford University Press.

Nielsen, K., & Cleal, B. (2010). Predicting flow at work: Investigating the activities and job characteristics that predict flow states at work. *Journal of Occupational Health Psychology, 15*, 180-190. doi: 10.1037/a0018893

Noar, S. M. (2003). The role of structural equation modeling in scale development. *Structural Equation Modeling, 10*, 622-647. doi: 10.1207/S15328007SEM1004_8

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

O'Reardon, J. P., & Amsterdam, J. D. (1998). Treatment-resistant depression: Progress and limitations. *Psychiatric Annals, 28*, 663-640.

O'Reardon, J. P., Brunswick, D. J., & Amsterdam, J. D. (2000). Treatment-resistant depression in the age of serotonin: Evolving strategies. *Current Opinion in Psychiatry, 13*, 93-98.

Oldham, G. R., & Hackman, J. R. (2010). Not what it was and not what it will be: The future of job design research. *Journal of Organizational Behavior, 31*, 463-479. doi: 10.1002/job.678

Oldham, G. R., Hackman, J. R., & Pearce, J. L. (1976). Conditions under which employees respond positively to enriched work. *Journal of Applied Psychology, 61*, 395-403. doi: 10.1037/0021-9010.61.4.395

Ordóñez, L. D., Schweitzer, M. E., Galinsky, A. D., & Bazerman, M. H. (2009). *Goals gone wild: The systematic side effects of over-prescribing goal setting*. Unpublished manuscript, Harvard Business School, Harvard University, Cambridge, Massachusetts.

Overholser, J. (2005). Contemporary psychotherapy: Promoting personal responsibility for therapeutic change. *Journal of Contemporary Psychotherapy, 35*, 369-376. doi: 10.1007/s10879-005-6699-4

Pallant, J. (2011). *SPSS survival manual: A step by step guide to data analysis using the SPSS program* (4th ed.). Crows Nest, Australia: Allen and Unwin.

Pallanti, S., Hollander, E., Bienstock, C., Koran, L., Leckman, J., Marazziti, D., . . . International treatment refractory OCD consortium. (2002). Treatment non-response in OCD: Methodological issues and operational definitions. *The International Journal of Neuropsychopharmacology, 5*, 181-191. doi: 10.1017/S1461145702002900

Panzarella, R. (1980). The phenomenology of aesthetic peak experiences. *Journal of Humanistic Psychology, 20*, 69-85. doi: 10.1177/002216788002000105

Paulhus, D. L. (1988). *Assessing self deception and impression management in self-reports: The balanced inventory of desirable responding*. Unpublished manual. University of British Columbia. Vancouver, Canada.

Pekala, R. J., Wenger, C. F., & Levine, R. L. (1985). Individual differences in phenomenological experience: States of consciousness as a function of absorption *Journal of Personality and Social Psychology, 48*, 125-132. doi: 10.1037/0022-3514.48.1.125

Percival, G., Crous, F., & Schepers, J. M. (2003). Cognitive potential and job complexity as predictors of flow. *SA Journal of Industrial Psychology, 29*(2), 60-71.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879-903. doi: 10.1037/0021-9010.88.5.879

Privette, G. (1981). Dynamics of peak performance. *Journal of Humanistic Psychology, 21*, 57-67. doi: 10.1177/002216788102100106

Privette, G. (1982). Experiential correlates of peak intellectual performance. *Psychological Reports, 51*, 323-330. doi: 10.2466/pr0.1982.51.1.323

Privette, G. (1983). Peak experience, peak performance, and flow: A comparative analysis of positive human experiences. *Journal of Personality and Social Psychology, 45*, 1361-1368. doi: 10.1037/0022-3514.45.6.1361

Privette, G. (1984). *Experience questionnaire.* University of West Florida, Pensacola, Florida.

Privette, G. (1986). From peak performance and peak experience to failure and misery. *Journal of Social Behavior and Personality, 1*, 233-243.

Privette, G. (2001). Defining moments of self-actualization: Peak performance and peak experience. In K. J. Schneider, J. F. Bugental & J. F. Pierson (Eds.), *The handbook of humanistic psychology: Leading edges in theory, research and practice* (pp. 161-180). Thousand Oaks, California: Sage.

Privette, G., & Bundrick, C. M. (1987). Measurement of experience: Construct and content validity of the experience questionnaire. *Perceptual and Motor Skills, 65*, 315-332. doi: 10.2466/pms.1987.65.1.315

Privette, G., & Sherry, D. (1986). Reliability and readability of questionnaire: Peak performance and peak experience. *Psychological Reports, 58*, 491-494. doi: 10.2466/pr0.1986.58.2.491

Provencher, H. L., & Keyes, C. L. M. (2011). Complete mental health recovery: Bridging mental illness with positive mental health. *Journal of Public Mental Health, 10*, 57-69. doi: 10.1108/17465721111134556

Quinn, R. W. (2005). Flow in knowledge work: High performance experience in the design of national security technology. *Administrative Science Quarterly, 50*, 610-641. doi: 10.2189/asqu.50.4.610

Quintano, C., Castellano, R., & Rocca, A. (2010). Influence of outliers on some multiple imputation methods. *Metodoloski zvezki, 7*(1), 1-16.

Rafferty, A. E. (1993). Bayesian model selection in structural equation models. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 163-180). Newbury Park, CA: Sage.

Rafferty, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25*, 111-163.

Ramana, R., Paykel, E. S., Cooper, Z., Hayhurst, H., Saxty, M., & Surtees, P. G. (1995). Remission and relapse in major depression: A two-year prospective follow-up study. *Psychological Medicine, 25*, 1161-1170. doi: 10.1017/S0033291700033134

Ravizza, K. (1977). Peak experiences in sport. *Journal of Humanistic Psychology, 17*, 35-40. doi: 10.1177/002216787701700404

Rheinberg, F., Vollmeyer, R., & Engeser, S. (2003). Die erfassung des flow-erlebens [The assessment of flow experience]. In J. Steinmeier-Pelster & F. Rheinberg (Eds.), *Diagnostik von selbstkonzept, lernmotivation und selbstregulation* (pp. 261-279). Goettingen, Germany: Hogrefe.

Ries, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin, 26*, 419-435. doi: 10.1177/0146167200266002

Riskind, J. H., Sarampote, C. S., & Mercier, M. A. (1996). For every malady a sovereign cure: Optimism training. *Journal of Cognitive Psychotherapy, 10*, 105-117.

Roche, S. M., & McConkey, K. M. (1990). Absorption: Nature, assessment, and correlates. *Journal of Personality and Social Psychology, 59*, 91-101. doi: 10.1037/0022-3514.59.1.91

Rogatko, T. P. (2009). The influence of flow on positive affect in college students. *Journal of Happiness Studies, 10*, 133-148. doi: 10.1007/s10902-007-9069-y

Roth, P. L., Switzer III, F. S., & Switzer, D. M. (1999). Missing data in multiple item scales: A monte carlo analysis of missing data techniques. *Organizational Research Methods, 2*, 211-232. doi: 10.1177/109442819923001

Rupayana, D. D. (2008). *Flow and engagement: Different degrees of the same?* , Unpublished masters dissertation, Kansas State University.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68-78. doi: 10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141-166. doi: doi:10.1146/annurev.psych.52.1.141

Ryan, R. M., & Deci, E. L. (2008). A self-determination approach to psychotherapy: The motivational basis for effective change. *Canadian Psychology, 49*, 186-193.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*, 1069-1081. doi: 10.1037/0022-3514.57.6.1069

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*, 719-727. doi: 10.1037/0022-3514.69.4.719

Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology, 21*(7), 600-619.

Salanova, M., Bakker, A. B., & Llorens, S. (2006). Flow at work: Evidence for an upward spiral of personal and organizational resources. *Journal of Happiness Studies, 7*, 1-22. doi: 10.1007/s10902-005-8854-8

Sass, D. A., & Smith, P. L. (2006). The effects of parceling unidimensional scales on structural parameter estimates in structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal, 13*, 566-586. doi: 10.1207/s15328007sem1304_4

Sato, I. (1988). Bosozoku: Flow in Japanese motorcycle gangs. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 92-117). New York: Cambridge University Press.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147-177. doi: 10.1037/1082-989X.7.2.147

Schaufeli, W. B., & Bakker, A. (2003). UWES: Utrecht Work Engagement Scale *Preliminary Manual* (pp. 58): Occupational Health Psychology Unit, Utrecht University.

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior, 25*, 293-315. doi: 10.1002/job.248

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement, 66*, 701-716. doi: 10.1177/0013164405282471

Schaufeli, W. B., Bakker, A. B., & Van Rhenen, W. (2009). How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *Journal of Organizational Behavior, 30*, 893-917. doi: 10.1002/job.595

Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies, 3*, 71-92. doi: 10.1023/A:1015630930326

Schindehutte, M., Morris, M., & Allen, J. (2006). Beyond achievement: Entrepreneurship as extreme experience. *Small Business Economics, 27*, 349-368. doi: 10.1007/s11187-005-0643-6

Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counselling psychology. *Journal of Counseling Psychology, 57*, 1-10. doi: 10.1037/a0018082

Schmid, J., & Leiman, J. M. (1957). The development of hierarchical factor solutions. *Psychometrika, 22*, 53-61. doi: 10.1007/bf02289209

Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 12*, 262-274. doi: 10.1037/0033-2909.124.2.262

Schmidt, J., Shernoff, D. J., & Csikszentmihalyi, M. (2007). Individual and situational factors related to the experience of flow in adolescence: A multilevel approach. In A. D. Ong & M. van Dulmen (Eds.), *The handbook of methods in positive psychology* (pp. 542-558). Oxford: Oxford University Press.

Schmitt, N., & Stuits, D. M. (1985). Factors defined by negatively keyed items: The result of careless respondents? *Applied Psychological Measurement, 9*, 367-373. doi: 10.1177/014662168500900405

Schriesheim, C. A., & Eisenbach, R. J. (1995). An exploratory and confirmatory factor-analytic investigation of item wording effects on the obtained factor structures of survey questionnaire measures. *Journal of Management, 21*, 1177-1193. doi: 10.1177/014920639502100609

Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics, 6*, 461-464. doi: 10.1214/aos/1176344136

Scollon, C. N., Kim-Prieto, C., & Diener, E. (2003). Experience sampling: Promises and pitfalls, strengths and weaknesses. *Journal of Happiness Studies, 4*, 5-34. doi: 10.1023/A:1023605205115

Scottish Executive Social Research. (2007). Employee engagement in the public sector: A review of literature. Retrieved from http://www.scotland.gov.uk/Resource/Doc/176883/0049990.pdf

Seligman, M. E. P. (1995). The effectiveness of psychotherapy: The consumer reports study. *American Psychologist, 50*, 965-974. doi: 10.1037/0003-066X.50.12.965

Seligman, M. E. P. (2002). Positive psychology, positive prevention, and positive therapy. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 3-9). New York: Oxford University Press.

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5-14. doi: 10.1037/0003-066X.55.1.5

Shapiro, D. A., & Shaprio, D. (1982). Meta-analysis of comparative therapy outcome studies: A replication and refinement. *Psychological Bulletin, 92*, 581-604. doi: 10.1037/0033-2909.92.3.581

Shea, T. M., Elkin, I., Imber, S. D., Sotsky, S. M., Watkins, J. T., Collins, J. F., . . . Parloff, M. B. (1992). Course of depressive symptoms over follow-up: Findings from the National Institute of Mental Health Treatment of Depression Collaborative Research Program. *Archives of General Psychiatry, 49*, 782-787.

Shernoff, D. J., & Csikszentmihalyi, M. (2009). Flow in schools. Cultivating engaged learners and optimal learning environments. In R. Gilman, E. Huebner & M. Furlong (Eds.), *Handbook of positive psychology in schools* (pp. 131-145). New York: Taylor & Francis.

Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly, 18*, 158-176. doi: 10.1521/scpq.18.2.158.21860

Sherry, J. L. (2004). Flow and media enjoyment. *Communication Theory, 14*, 328-347. doi: 10.1111/j.1468-2885.2004.tb00318.x

Shin, N. (2006). Online learner's 'flow' experience: An empirical study. *British Journal of Educational Technology, 37*, 705-720. doi: 10.1111/j.1467-8535.2006.00641.x

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 74*, 422-445. doi: 10.1037/1082-989X.7.4.422

Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta-analysis. *Journal of Clinical Psychology, 65*, 467-487. doi: 10.1002/jclp.20593

Slade, M. (2010). Mental illness and well-being: The central importance of positive psychology and recovery approaches. *BMC Health Services Research, 10*(1), 26.

Smith-Jackson, T. L., & Klein, K. W. (2009). Open-plan offices: Task performance and mental workload. *Journal of Environmental Psychology, 29*, 279-289. doi: 10.1016/j.jenvp.2008.09.002

Smith, M. L., & Glass, G. V. (1977). Meta-analysis of psychotherapy outcomes studies. *American Psychologist, 32*, 752-760. doi: 10.1037/0003-066X.32.9.752

Snyder, C. R., & McCullough, M. E. (2000). A positive psychological field of dreams:"If you build It, they will come...". *Journal of Social and Clinical Psychology, 19*, 151-160. doi: 10.1521/jscp.2000.19.1.151

Song, S., Freemantle, N., Sheldon, T. A., House, A., Watson, P., Long, A., & Mason, J. (1993). Selective serotonin reuptake inhibitors: Meta-analysis of efficacy and acceptability. *British Medical Journal, 306*, 683-687. doi: 10.1136/bmj.306.6879.683

Spence, G. B., & Grant, A. M. (2007). Professional and peer life coaching and the enhancement of goal striving and well-being: An exploratory study. *The Journal of Positive Psychology, 2*, 185-194. doi: 10.1080/17439760701228896

Spence, G. B., & Oades, L. G. (2011). Coaching with self-determination in mind: Using theory to advance evidence-based coaching practice. *International Journal of Evidence Based Coaching and Mentoring, 9*, 37-55.

Springer, K. W., & Hauser, R. M. (2006). An assessment of the construct validity of Ryff's Scales of Psychological Well-Being: Method, mode, and measurement effects. *Social Science Research, 35*, 1080-1102. doi: 10.1016/j.ssresearch.2005.07.004

SPSS Inc. (2007). PASW missing values 18. Chicago, IL: SPSS Inc.

Stein, D. J., Ipser, J. C., & Seedat, S. (2006). Pharmacotherapy for post traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews 2006, Issue 1. Art. No.: CD002795*. doi: DOI: 10.1002/14651858.CD002795.pub2

Stein, D. J., Spadaccini, E., & Hollander, R. (1995). Meta-analysis of pharmacotherapy trials for obsessive-compulsive disorder. *International Clinical Psychopharmacology, 10*, 11-18. doi: 10.1097/00004850-199503000-00002

Stewart, W., & Barling , J. (1996). Daily work stress, mood and interpersonal job performance: A mediational model. *Work & Stress, 10*, 336-351. doi: 10.1080/02678379608256812

Sutcliffe, K. M., & Vogus, T. (2003). Organization for resilience. In K. S. Cameron, J. E. Dutton & R. E. Quinn (Eds.), *Positive organizational scholarship* (pp. 94-110). San Francisco: Berrett-Koehler.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson.

Tellegen, A., & Atkinson, G. (1974). Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology, 83*, 268-277. doi: 10.1037/h0036681

Tetrick, L. E., & Quick, J. C. (2003). Prevention at work: Public health in occupational settings. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (pp. 3-17). Washington DC: American Psychological Association.

Thomas, E. A. C., & Weaver, W. B. (1975). Cognitive processing and time perception. *Perception & Psychophysics, 17*, 363-367. doi: 10.3758/bf03199347

Thompson, A., Hunt, C., & Issakidis, C. (2004). Why wait? Reasons for delay and prompts to seek help for mental health problems in an Australian clinical sample. *Social Psychiatry and Psychiatric Epidemiology, 39*, 810-817. doi: 10.1007/s00127-004-0816-7

Thompson, A., Issakidis, C., & Hunt, C. (2008). Delay to seek treatment for anxiety and mood disorders in an Australian clinical sample. *Behaviour Change, 25*, 71-84.

Thornton, F., Privette, G., & Bundrick, C. (1999). Peak performance of business leaders: An experience parallel to self-actualization theory. *Journal of Business and Psychology, 14*, 253-264. doi: 10.1023/a:1022143225092

Torraco, R. J. (2005). Work design theory: A review and critique with implications for human resource development. *Human Resource Development Quarterly, 16*, 85-109. doi: 10.1002/hrdq.1125

Trewin, D., & Pink, B. (2006). Australian and New Zealand Standard Classification of Occupations (pp. 815): Australian Bureau of Statistics & Statistics New Zealand.

Tse, P. U., Intriligator, J., Rivest, J., & Cavanagh, P. (2004). Attention and the subjective expansion of time. *Perception & Psychophysics, 66*, 1171-1189. doi: 10.3758/bf03196844

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38*, 1-10. doi: 10.1007/bf02291170

Turner, N., Barling, J., & Zacharatos, A. (2002). Positive psychology at work. In C. R. Synder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 715-728). New York: Oxford University Press.

U.S. Department of Health and Human Services. (1999). Mental health: A report of the surgeon general. Rockville, MD.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4-70. doi: 10.1177/109442810031002

Vella-Brodrick, D. A. (2011). Positive psychology: Reflecting on the past and projecting into the future. *InPsych, 33*(2), 10-13.

Wang, J. (2007). Mental health treatment dropout and its correlates in a general population. *Medical Care, 45*, 224-229. doi: 10.1097/01.mlr.0000244506.86885.a5

Wankel, L. M. (1993). The importance of enjoyment to adherence and psychological benefits from physical activity. *International Journal of Sport Psychology, 24*, 151-169.

Wankel, L. M., & Berger, B. G. (1990). The psychological and social benefits of sport and physical activity. *Journal of Leisure Research, 22*, 167-182.

Weijters, B., Geuens, M., & Schillewaert, N. (2009). The proximity effect: The role of inter-item distance on reverse-item bias. *International Journal of Research in Marketing, 26*, 2-12. doi: 10.1016/j.ijresmar.2008.09.003

Weissinger, E. (1995). Effects of boredom on self-reported health. *Society and Leisure, 18*, 21-32.

Wells, A. J. (1988). Self-esteem and optimal experience. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 327-341). New York: Cambridge University Press.

Westerhof, G., & Keyes, C. L. M. (2010). Mental illness and mental health: The two continua model across the lifespan. *Journal of Adult Development, 17*, 110-119. doi: 10.1007/s10804-009-9082-y

Widaman, K. F. (1993). Common factor analysis versus principal component analysis: Differential bias in representing model parameters? *Multivariate Behavioral Research, 28*, 263-311. doi: 10.1207/s15327906mbr2803_1

Wierzbicki, M., & Pekarik, G. (1993). A meta-analysis of psychotherapy dropout. *Professional Psychology: Research and Practice, 24*, 190-195. doi: 10.1037/0735-7028.24.2.190

Wilson, C. (1972). *New pathways in psychology. Maslow and the post-freudian revolution*. London: Gollancz.

Wolff, H.-G., & Preising, K. (2005). Exploring item and higher order factor structure with the Schmid-Leiman solution: Syntax codes for SPSS and SAS. *Behavior Research Methods, 37*, 48-58. doi: 10.3758/bf03206397

Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The Counseling Psychologist, 34*, 806-838. doi: 10.1177/0011000006288127

Wright, T. A. (2003). Positive organizational behavior: An idea whose time has truly come. *Journal of Organizational Behavior, 24*, 437-442. doi: 10.1002/job.197

Wright, T. A., & Quick, J. C. (2009). The role of positive-based research in building the science of organizational behavior. *Journal of Organizational Behavior, 30*, 329-336. doi: 10.1002/job.581

Wuthnow, R. (1978). Peak experiences: Some empirical tests. *Journal of Humanistic Psychology, 18*, 59-75.

Youssef, C. M., & Luthans, F. (2009). Positive organizational behavior. In S. J. Lopez (Ed.), Encyclopedia of positivie psychology (pp. 733-737). West Sussex, United Kingdom: Blackwell Publishing Ltd. doi: 10.1002/9781444306002

Zachariae, R., Jorgensen, M. M., Bjerring, P., & Svendsen, G. (2000). Autonomic and psychological responses to an acute psychological stressor and relaxation: The influence of hypnotizability and absorption. *International Journal of Clinical and Experimental Hypnosis, 48*, 388-403. doi: 10.1080/00207140008410368

Appendices

Appendix A-1: Originally Developed Conditions to Flow and Flow Scales

Preamble: In the spaces below please list as many activities as you can that you have completed in the last **seven** days at **work**. An activity can be defined as anything that requires psychic energy/attention; it does not necessarily have to be a physical activity requiring a physical skill. For example, one such activity might be sending an email.

Please enter as many activities/tasks completed at **work** in the spaces below (one activity per space).

[Ten response fields]

To indicate your response to each statement, move your cursor over the appropriate circle and then use the left click mouse button to select it. Once you have responded to all the statements, please ensure you submit your responses by clicking the submit button located at the bottom of this page.

Scoring key: 0 = Does not apply to me, 1= Very untrue atypical or uncharacteristic of me, 2 = Fairly untrue atypical or uncharacteristic of me, 3 = A bit untrue atypical or uncharacteristic of me, 4 = A bit true typical or characteristic of me, 5 = Fairly true typical or characteristic of me, 6 = Very true typical or characteristic of me.

Item No.	Subscale	Item
1	CHL	The activities I undertake equal my capabilities.
2	CON	During my activities I am fully focused on the activity at hand.
3	GLS	I have clear goals before I engage in any activity.
4	FBK	I get/receive feedback towards goals/activities I set.
5	CON	I am involved in activities that allow me to forget about my worries and frustrations about everyday life.
6	CTL	I'm able to perceive that I have control over the activity or situation at hand.
7	LOS	I do not think about myself when engaging in activities.
8	TOT	I lose track of time during activities.
9	CHL	The activities I engage in are too easy for me. (N)
10	CON	The activities I undertake require my full concentration.
11	GLS	When completing activities, goals are clear to me.
12	FBK	Feedback is not something I obtain. (N)

Item No.	Subscale	Item
13	CON	When involved in my activities, I forget about the unpleasant aspects of life.
14	CTL	I believe that perfection is attainable in the activities I undertake.
15	LOS	I feel a sense of union with my environment when engaging in activities.
16	TOT	Time appears to be going much faster than normal in my activities.
17	CHL	Given my skills I believe that the activities I engage in are achievable.
18	CON	My attention is completely absorbed when I am completing activities.
19	GLS	Before I complete activities I think or envisage what the outcomes might be like.
20	FBK	When I receive feedback it occurs immediately after an action/activity.
21	CON	My activities require me to concentrate all my attention to the task at hand.
22	CTL	I feel as if I have a sense of control in activities I undertake.
23	LOS	I feel so involved in my activities that I forget about myself.
24	TOT	During my activities time varies to that of reality.
25	CHL	I engage in activities that appropriately challenge my capabilities.
26	MAA	When I am completing activities I am easily distracted. (N)
27	GLS	When I am completing activities the goals or outcomes are not clear to me. (N)
28	FBK	The feedback I obtain is usually not related to my activities. (N)
29	CON	When I engage in activities, I don't feel focused on the task at hand. (N)
30	CTL	When completing activities, there are a number of factors that are out of my control. (N)
31	LOS	I am conscious of myself during activities I complete. (N)
32	TOT	After completing activities I am amazed at how fast time has passed.
33	CHL	The activities I engage in are too difficult for me to accomplish. (N)
34	MAA	During my activities I have doubts and question why am I doing them. (N)
35	FBK	I use feedback obtained to evaluate how to accomplish my goals/activities.

Item No.	Subscale	Item
36	CTL	I worry about losing control of goal attainment when completing activities. (N)
37	MAA	I do not think about my actions, the right thing just happens.
38	TOT	During my activities I never notice that time varies from reality. (N)
39	CHL	I undertake activities that I have a good chance of completing.
40	FBK	During my activities I try to spot or recognise any feedback that might be useful for me.
41	CTL	I believe that I am able to exercise a sense of control with regard to the activities I undertake.
42	FBK	I pay no attention to feedback presented to me. (N)

Note. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness; (N) = Negatively keyed item.

Appendix A-2: Demographic Questions – Study 1

Thank you for taking the time to complete this questionnaire. Please respond to the following questions about yourself by using the drop down arrow or by typing in your response where appropriate.

Age (in years): [*Text response field]*

Gender: [*1 = Male, 2 = Female]*

Please indicate your highest level of education:

[1 = Did not finish school, 2 = High School (year 7-12), 3 = Certificate Level, 4 = Advanced Diploma/Diploma, 5 = Bachelor Degree, 6 = Graduate Diploma/Graduate Certificate, 7 = Postgraduate Degree,
8 = Apprenticeship]

Please enter your occupation: [*Text response field]*

Please indicate your income (year):

[1= Up to $20,000, 2= $20,001 - $40,000, 3= $40,001 - $60,000, 4= $60,001 - $80,000, 5= Greater than $80,001, 6= Do not wish to divulge]

Appendix A-3: Ethics Approval – Study 1

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

ACU National

Human Research Ethics Committee

Committee Approval Form

Principal Investigator/Supervisor: Prof Barry Fallon Melbourne Campus

Co-Investigators: Melbourne Campus

Student Researcher: Chris Holt Melbourne Campus

Ethics approval has been granted for the following project:

Work motivation: cultural flow, work and personal satisfaction, commitment and OCB

for the period: 27th June 2006 - 1st May 2007

Human Research Ethics Committee (HREC) Register Number: V200506 59

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans* (1999) apply:

(i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:

- security of records
- compliance with approved consent procedures and documentation
- compliance with special conditions, and

(ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:

- proposed changes to the protocol
- unforeseen circumstances or events
- adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than minimum risk. There will also be random audits of a sample of projects considered to be of minimum risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: .. Date: 28/06/06

Research Services Officer, Melbourne Campus)

Appendix A-4: Participant Information Sheet – Study 1

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

ACU National

INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT: Work Motivation: Culturing Flow, Work and Personal Satisfaction, Commitment and Organisational Citizenship Behaviour.

NAME OF PRINCIPAL INVESTIGATOR or SUPERVISOR: BARRY J FALLON

NAME OF STUDENT RESEARCHER: CHRIS HOLT

AND (NAME OF) PROGRAMME IN WHICH ENROLLED: PHD

The purpose of the current study is to test a newly developed measure which aims to measure the concept flow. Flow can best be described as a form of optimal intrinsic motivation where in which an individual operates at full capacity. In addition to this flow experience, we would also like to see how this relates to mental health/general well being.

There are no known risks, inconveniences and/or discomforts associated with completing this questionnaire, should you however feel that this questionnaire is distressing in anyway please feel free to refer to the contacts listed below for appropriate support/counselling

To be involved in this study we invite you to complete the following questionnaire. The questionnaire should take approximately 30mins to complete.

As participants you may find this activity, informative, educational, and fun, it may prompt you to think about areas in your life you never once thought relate happiness/well being. On a more general level this study will allow us to possibly identify the prevalence of flow, and its importance (if any) to mental health. Overall findings obtained from this study may be published in an appropriate psychological journal

As a possible participant you are free to withdraw your participation in the study anytime throughout the questionnaire, without giving a reason.

No identifiable information is asked during the conduct of this study and as result confidentiality will be maintained at all times.

Any questions regarding this project should be directed to the Principal Investigator or to the Supervisor and the Student Researcher

Mr Christopher J Holt *Professor Barry J Fallon*
PHD Candidate

on telephone number 9953 3108 ....

in the School of Psychology ....

full Campus Address: 115 Victoria Pde, Fitzroy Vic ....

If you would like to obtain a report of the findings from this study please forward your email details to chrisholt@internode.on.net.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Investigator or Supervisor and Student Researcher has (have) not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee.

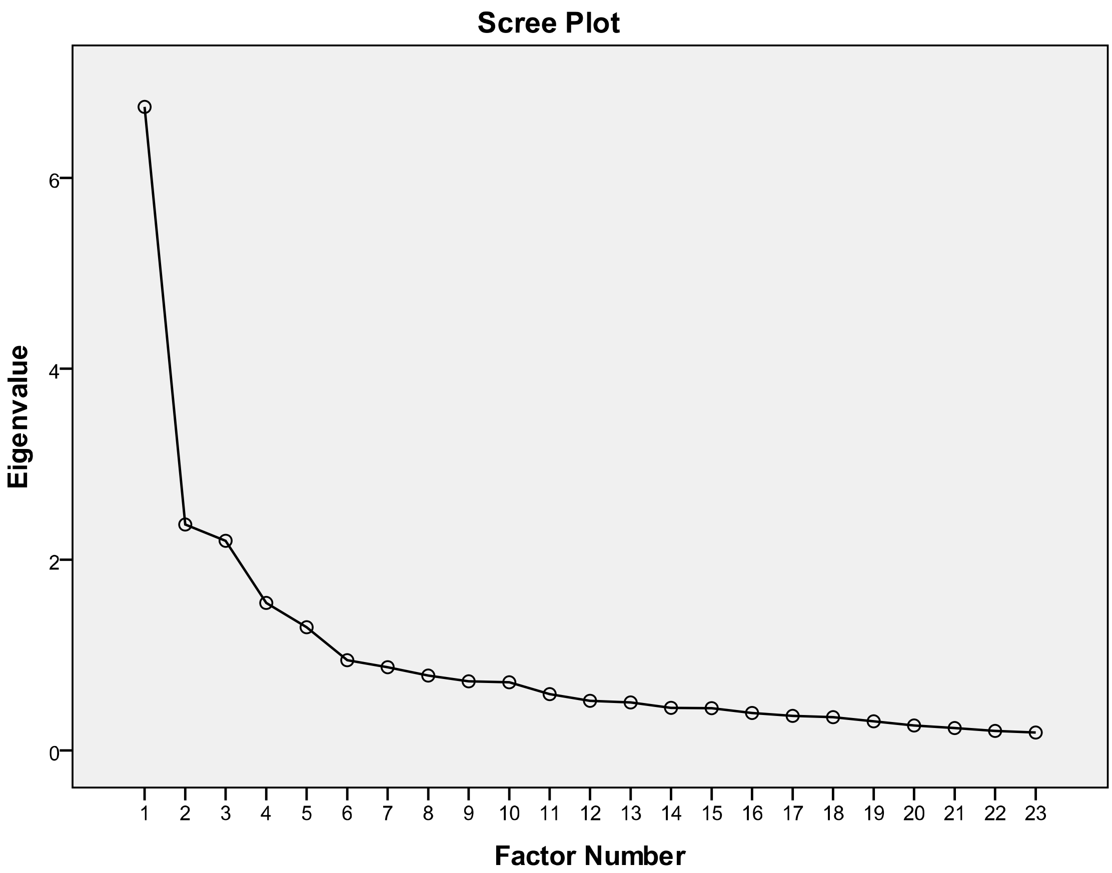
VIC: Chair, HREC
C/o Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.

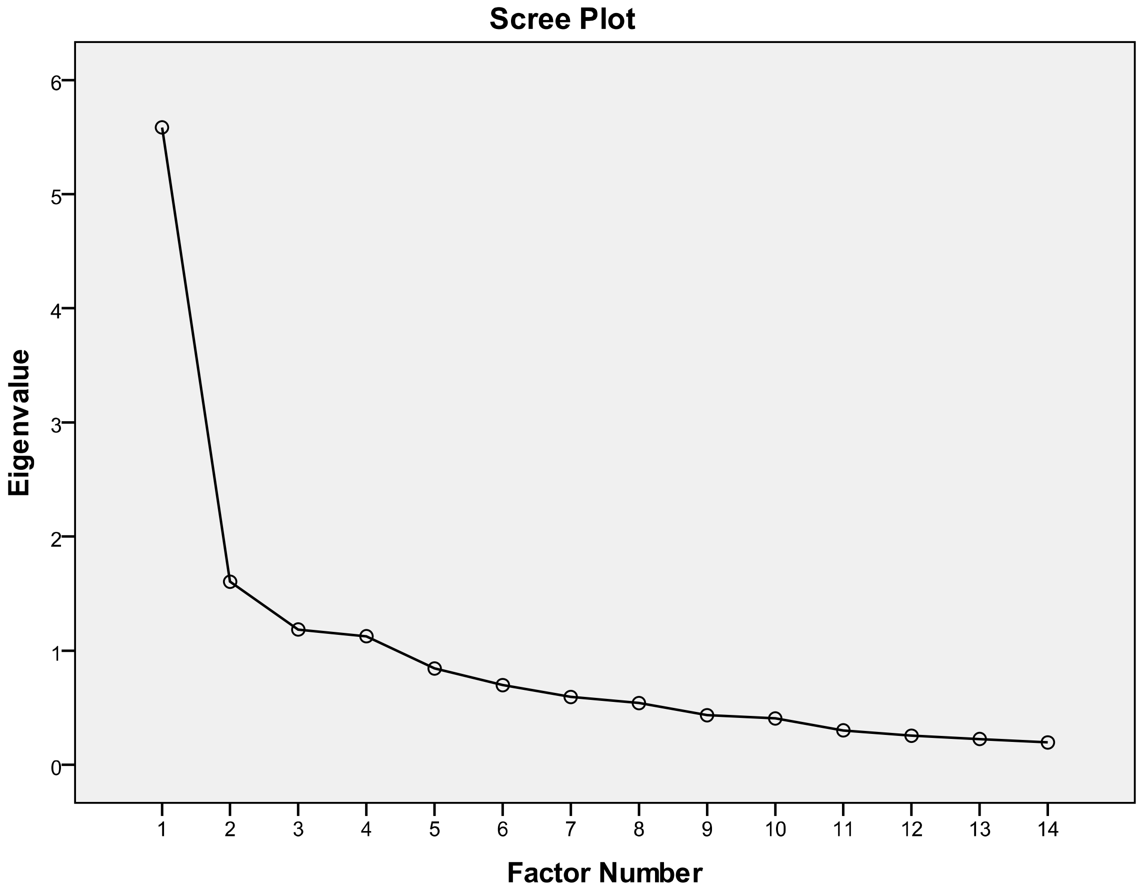
....

Principal Investigator Student Researcher

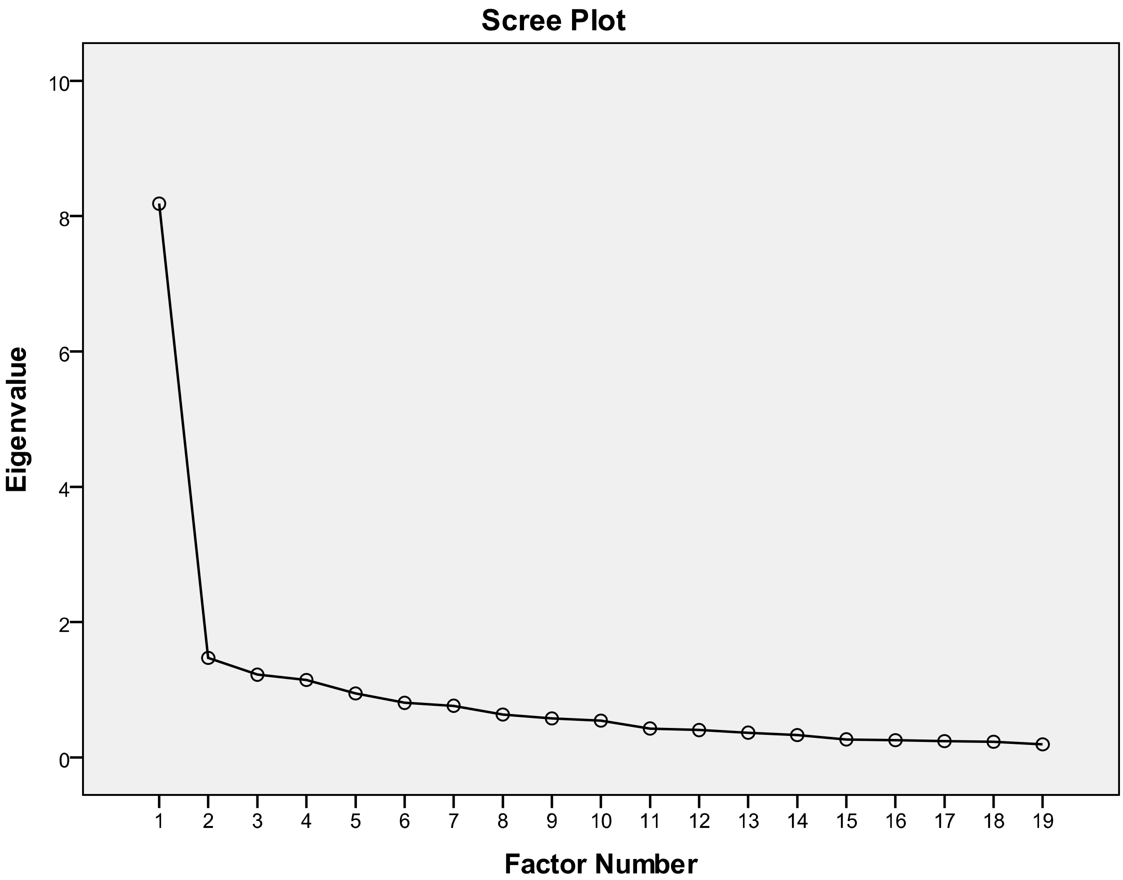
Appendix A-5: Initial EFA Scree Plot – Original Conditions to Flow Scale



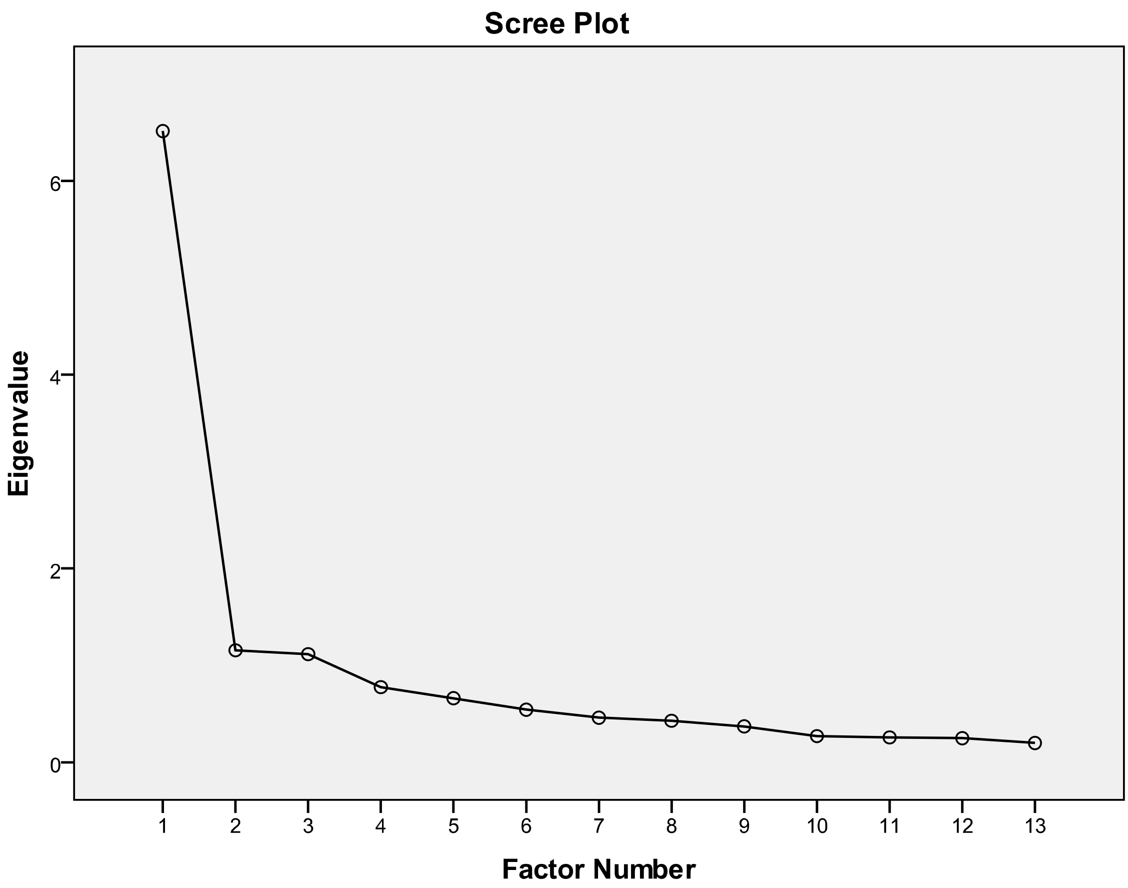
Appendix A-6: Revised EFA Scree Plot – Original Conditions to Flow Scale



Appendix A-7: Initial EFA Scree Plot – Original Flow Scale



Appendix A-8: Revised EFA Scree Plot – Original Flow Scale



Appendix A-9: Revised Conditions to Flow and Flow Scales

Preamble: Please respond to the following statements in regard to your experience of work (employment) over the last two weeks. We are not interested in how you generally behave and feel but rather how you felt over the last two weeks at work. A few statements may require you to think about unfamiliar experiences that may actually occur to you, so please take your time to understand each statement as best you can before responding. Some statements may seem similar, but this is necessary to best capture the phenomenon of interest, so please respond to all statements. Some statements are also negatively phrased (i.e. contain 'do not'), please ensure you respond with this in mind.

To indicate your response to each statement, move your cursor over the appropriate circle and then use the left click mouse button to select it. Once you have responded to all the statements, please ensure you submit your responses by clicking the submit button located at the bottom of this page.

Scoring key: 0 = Never, 1 = Almost Never, 2 = Seldom, 3 = Sometimes, 4 = Usually, 5 = Almost Always

Item No.	Subscale	Item
1	CHL	My work appropriately challenged my capabilities.
2	GLS	I had clear goals before I engaged in my work.
3	CTL	I felt that I was in control of my work.
4	FBK	At work I could tell if I was succeeding in my goals.
5	CON	At work I needed to concentrate all my attention on what I was doing.
6	LOS	At work I forgot about who I was.
7	MAA	During my work I was unaware of how much I was concentrating.
8	TOT	At work I was amazed at how fast time had passed.
9	CHL	My work was neither easy nor too difficult for me.
10	GLS	At work my goals were clear to me.
11	CTL	I believed that it was possible to have control of my own work.
12	FBK	At work it was clear to me how well I was performing.
13	CON	My work required my full concentration.
14	LOS	At work I was oblivious to who I was.
15	MAA	During my work I did not question/doubt what I was doing.
16	TOT	At work I felt that time appeared to be going much faster than normal.

Item No.	Subscale	Item
17	CHL	My work appropriately challenged me.
18	GLS	Before I engaged in my work, my goals were clearly defined.
19	CTL	At work I believed that I was able to exercise a sense of control over what I was doing.
20	FBK	At work I was regularly aware of how well I was performing.
21	CON	At work my attention was completely absorbed in what I was doing.
22	LOS	At work I lost all thought of who I was.
23	MAA	During my work I was unaware of the amount of effort used.
24	TOT	At work I lost track of time.
25	CHL	Given my skills, my work was just manageable.
26	GLS	At work I regularly knew what I needed to achieve.
27	CTL	I did not worry about losing control of my work.
28	FBK	At work I immediately knew if I was performing well.
29	CON	At work I was fully focused on what I was doing.
30	LOS	At work I was unaware of who I was.
31	MAA	During my work I was only aware of what I was doing.
32	TOT	At work I felt that the passage of time varied from reality.
33	CHL	My work appropriately challenged my skill level.
34	GLS	At work I clearly understood what I needed to do.
35	CTL	I felt that I had total control of my work.
36	FBK	At work I clearly knew if I was performing well.
37	CON	At work I forgot about my worries of everyday life.
38	LOS	At work I felt that I was part of a larger system of action greater than myself.
39	MAA	I was so involved in my work that it felt spontaneous.
40	CHL	My work neither underutilised nor exceeded my skill level.
41	GLS	At work my demands (goals) were logically ordered.
42	CTL	At work I experienced a sense of control over what I was doing.

Item No.	Subscale	Item
43	FBK	At work I constantly knew if I was performing well.
44	CON	At work my mind did not wander away from what I was doing.
45	LOS	At work I was unaware of how others may have perceived me.
46	MAA	I was so involved in my work that it felt effortless.
47	CHL	At work I felt appropriately challenged.
48	GLS	At work I did not have any conflicting demands (goals).
49	CON	At work I was unaware of other events happening around me.
50	MAA	I was so involved in my work that it almost felt automatic.
51	CON	At work I forgot about the unpleasant aspects of life.
52	MAA	I felt that my work progressed smoothly.
53	CON	At work I forgot about my frustrations of everyday life.
54	CON	At work I forgot about the problems that were in my life.

Note. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness.

Appendix A-10: Demographic Questions – Studies 2, 3, and 4

Thank you for taking the time to complete this questionnaire. Please respond to the following questions about yourself by using the drop down arrow or by typing in your response where appropriate.

Age (in years): [*Text response field]*

Gender: [*1 = Male, 2 = Female]*

Please indicate your highest level of education:

[1 = Did not finish school, 2 = High School (year 7-12), 3 = Certificate Level, 4 = Advanced Diploma/Diploma, 5 = Bachelor Degree, 6 = Graduate Diploma/Graduate Certificate, 7 = Postgraduate Degree,
8 = Apprenticeship]

Please enter your occupation: [*Text response field]*

Please indicate your income (year):

[1= Up to $20,000, 2= $20,001 - $40,000, 3= $40,001 - $60,000, 4= $60,001 - $80,000, 5= Greater than $80,001, 6= Do not wish to divulge]

Average weekly hours of employment (in hours): [*Text response field]*

Held current position for (in years): [*Text response field]*

Appendix A-11: Ethics Amendment Approval Letter – Study 2

Dear Barry and Christopher

Thank you for returning the Ethics Progress Report for your project V200506 59 - Work Motivation: culturing Flow, Work and Personal Satisfaction, Commitment and OCB

The Chair of the Human Research Ethics Committee has approved your request to renew the period of data collection. The new expiry date for data collection is the **30.09.10**

A Progress Report is due at the end of this period. The relevant form may be obtained from the ACU National website www.acu.edu.au , or by contacting Research Services directly.

We wish you well in this ongoing project.

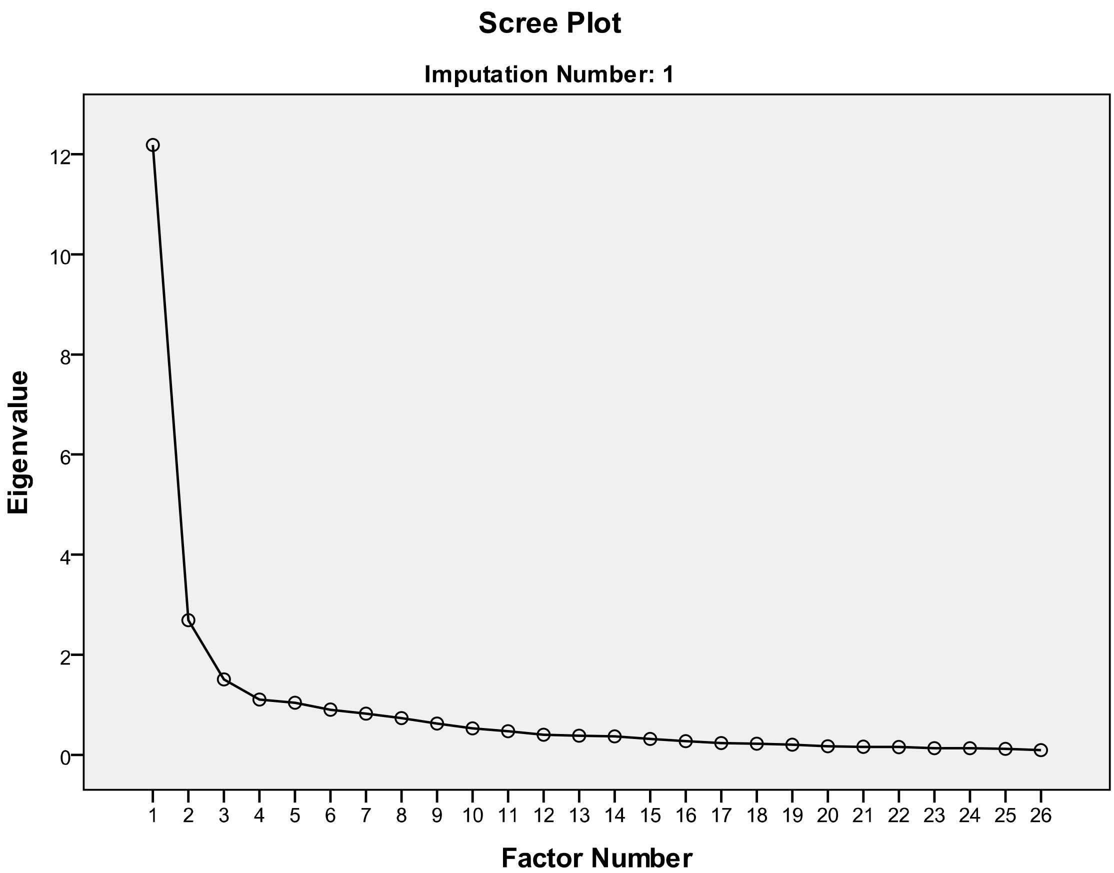
Kind regards,

Jasmine
****

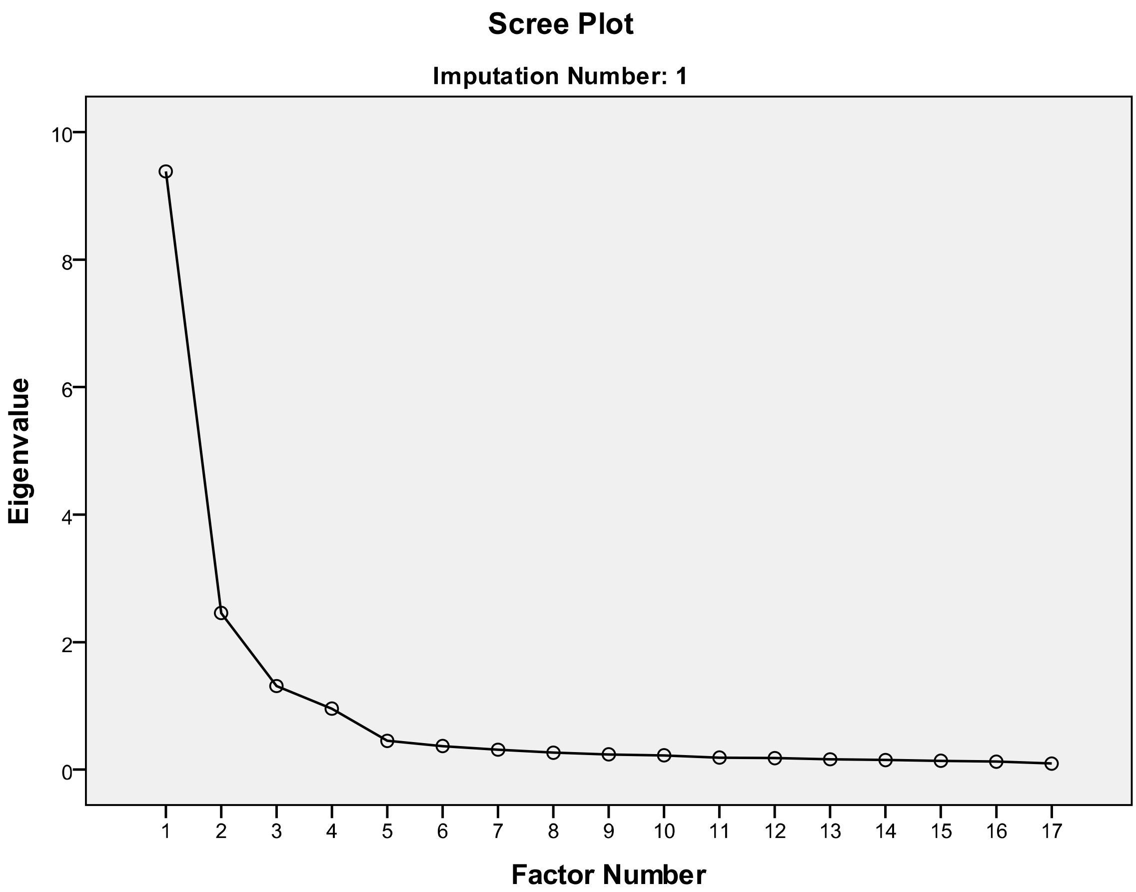
Research Services Officer (Ethics)
Australian Catholic University Limited
St Patricks Campus
Level 5, 250 Victoria Parade, Fitzroy VIC 3065
Locked Bag 4115, Fitzroy VIC 3065
Ph: +61 3 9953 3150
Fax: +61 3 9953 3315
Email: res.ethics@acu.edu.au
Jasmine.Sym@acu.edu.au

ABN 15 050 192 660
CRICOS Registration: 00004G, 00112C, 00873F, 00885B

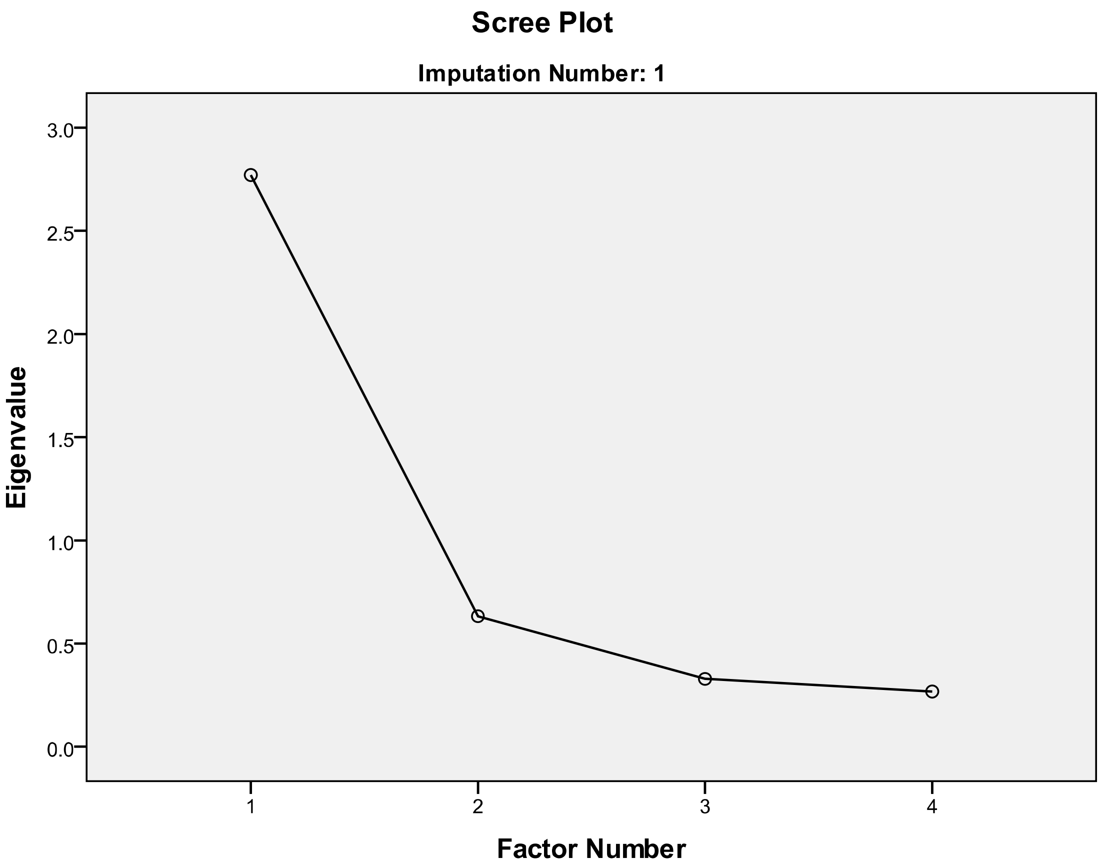
Appendix A-12: Initial EFA Scree Plot – Revised Conditions to Flow Scale



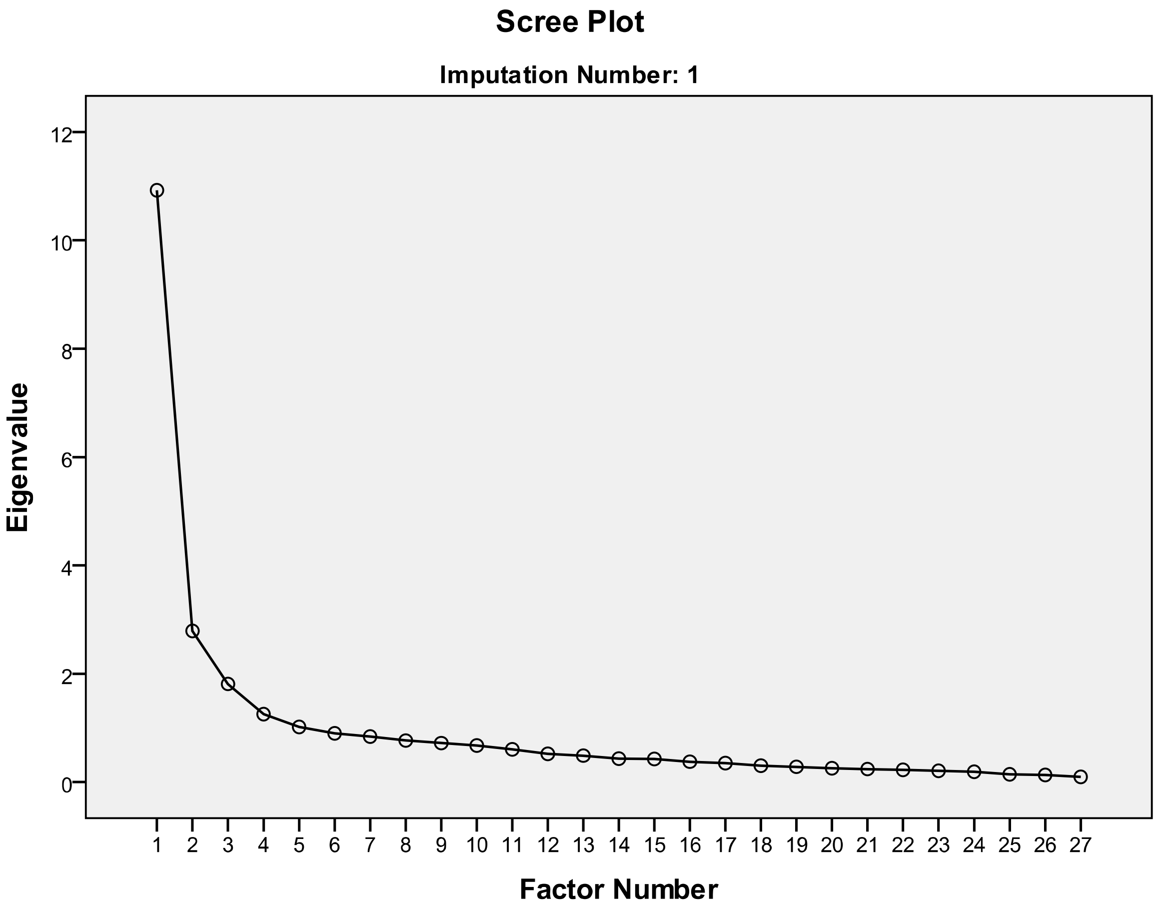
Appendix A-13: Revised EFA Scree Plot – Revised Conditions to Flow Scale



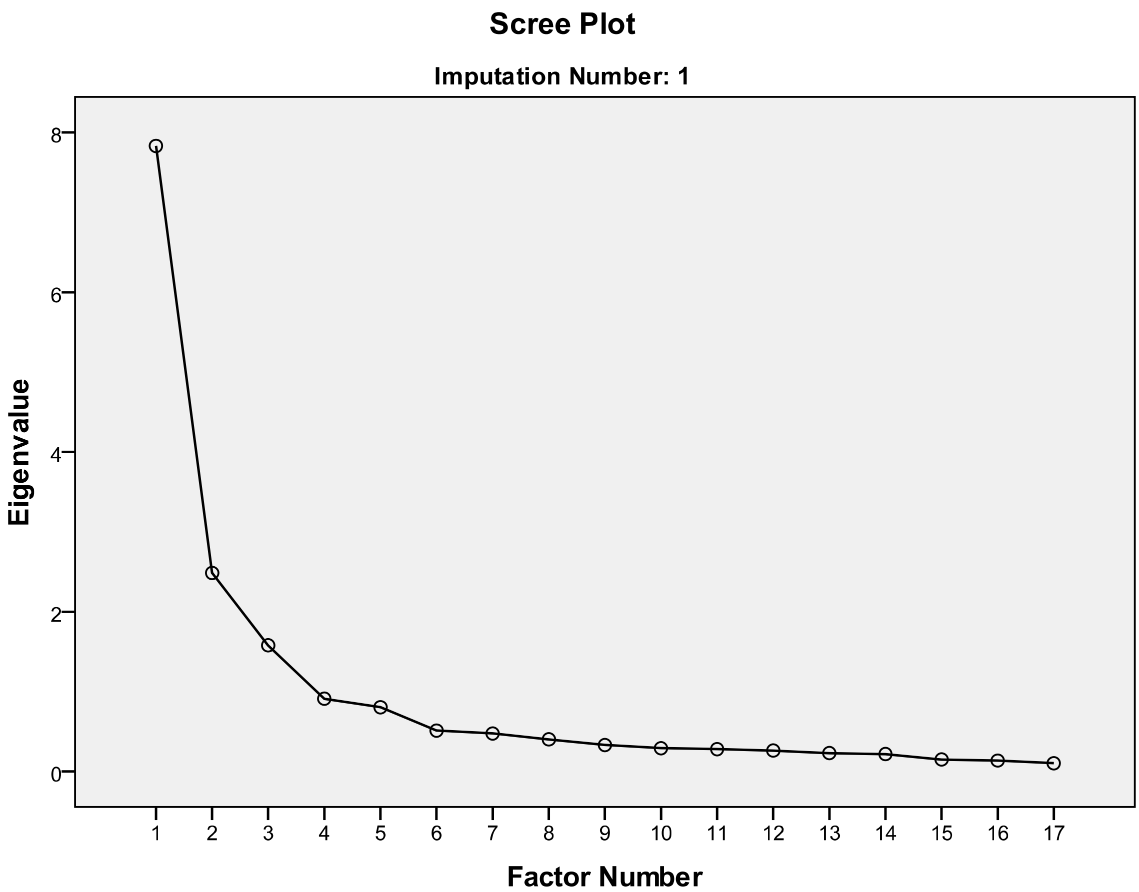
Appendix A-14: Higher-Order FA Scree Plot – Revised Conditions to Flow Scale



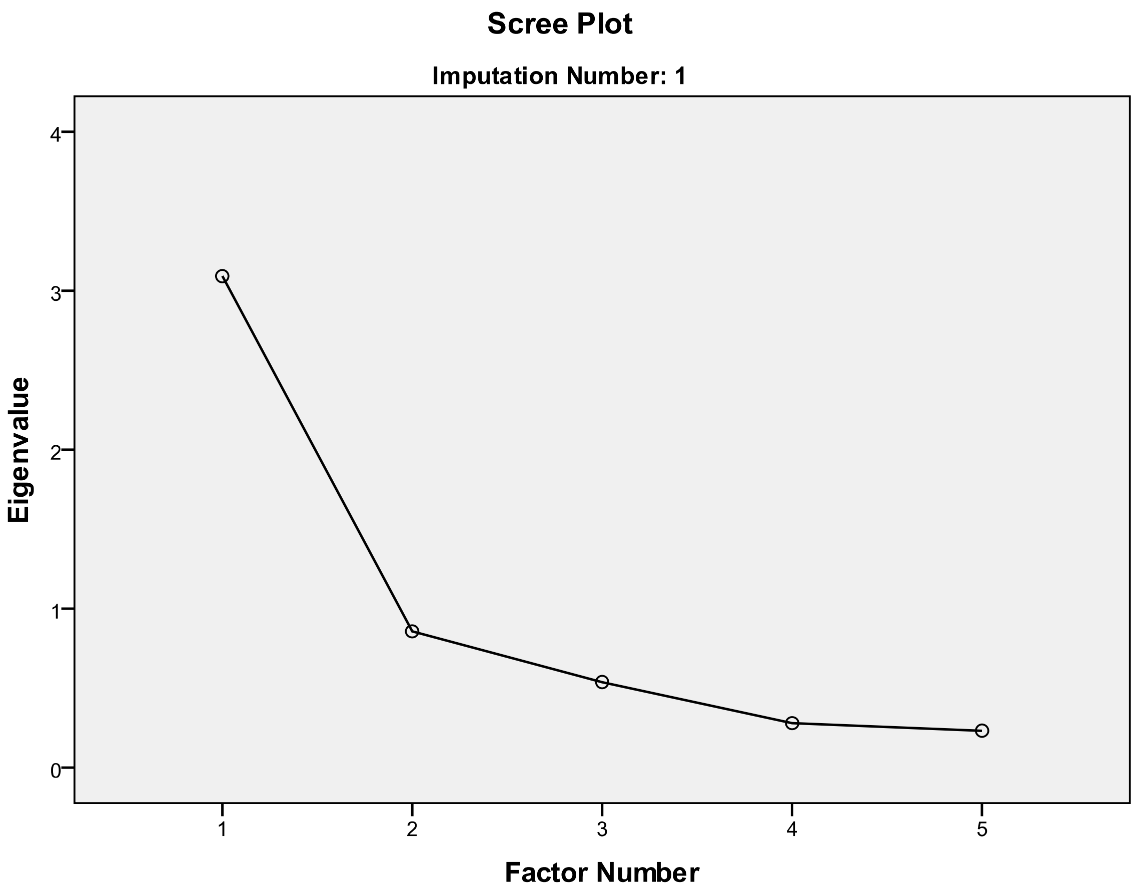
Appendix A-15: Initial EFA Scree Plot – Revised Flow Scale



Appendix A-16: Revised EFA Scree Plot – Revised Flow Scale



Appendix A-17: Higher-Order FA Scree Plot – Revised Flow Scale



Appendix A-18: Conditions to Flow and Flow Scales

Preamble: Please respond to the following statements in regard to your experience of work (employment) over the last two weeks. We are not interested in how you generally behave and feel but rather how you felt over the last two weeks at work. A few statements may require you to think about unfamiliar experiences that may actually occur to you, so please take your time to understand each statement as best you can before responding. Some statements may seem similar, but this is necessary to best capture the phenomenon of interest, so please respond to all statements. Some statements are also negatively phrased (i.e. contain 'do not'), please ensure you respond with this in mind. To indicate your response to each statement, move your cursor over the appropriate circle and then use the left click mouse button to select it.

Scoring key: 0 = Never, 1 = Almost Never, 2 = Seldom, 3 = Sometimes, 4 = Usually, 5 = Almost Always.

Scoring Subscales/Scales: each subscale is scored by computing a mean of the subscale items and each scale (Conditions to Flow or Flow Scale) is scored by computing the subscale means.

Item No.	Subscale	Item
1	CHL	My work appropriately challenged my capabilities.
2	GLS	I had clear goals before I engaged in my work.
3	CTL	I felt that I was in control of my work.
4	CON	At work I needed to concentrate all my attention on what I was doing.
5	LOS	At work I forgot about who I was.
6	ORD	At work I forgot about my worries of everyday life.
7	TOT	At work I was amazed at how fast time had passed.
8	CHL	My work appropriately challenged me.
9	GLS	At work my goals were clear to me.
10	CTL	I believed that it was possible to have control of my own work.
11	FBK	At work it was clear to me how well I was performing.
12	CON	My work required my full concentration.
13	LOS	At work I was oblivious to who I was.
14	ORD	At work I forgot about the unpleasant aspects of life.

Item No.	Subscale	Item
15	MAA	I was so involved in my work that it felt effortless.
16	TOT	At work I felt that time appeared to be going much faster than normal.
17	CHL	My work appropriately challenged my skill level.
18	GLS	Before I engaged in my work, my goals were clearly defined.
19	CTL	At work I believed that I was able to exercise a sense of control over what I was doing.
20	FBK	At work I was regularly aware of how well I was performing.
21	CON	At work my attention was completely absorbed in what I was doing.
22	LOS	At work I lost all thought of who I was.
23	MAA	I was so involved in my work that it almost felt automatic.
24	TOT	At work I lost track of time.
25	CHL	At work I felt appropriately challenged.
26	CTL	I felt that I had total control of my work.
27	FBK	At work I immediately knew if I was performing well.
28	CON	At work I was fully focused on what I was doing.
29	LOS	At work I was unaware of who I was.
30	ORD	At work I forgot about the problems that were in my life.
31	MAA	I felt that my work progressed smoothly.
32	FBK	At work I clearly knew if I was performing well.
33	CTL	At work I experienced a sense of control over what I was doing.
34	FBK	At work I constantly knew if I was performing well.

Note. FBK = Feedback; CHL = Appropriate Challenge; CTL = Control; GLS = Clear Goals; LOS = Loss of Self-Consciousness; CON = Deep Concentration; TOT = Transformation of Time; MAA = Merging of Action and Awareness; ORD = Order in Consciousness.

Appendix A-19: Balanced Inventory of Desirable Responding (BIDR)

Preamble: Using the scoring key below, indicate your response to each statement by moving your cursor over the appropriate circle and then use the left click mouse button to select it.

Scoring key: 1 ----------- 2 ----------- 3 ----------- 4 ----------- 5 ----------- 6 -----------7
Not True Somewhat True Very True

Item No.	Subscale	Item
1	SDP	My first impressions of people usually turn out to be right.
2	SDP	It would be hard for me to break any of my bad habits. (N)
3	SDP	I don't care to know what other people really think of me.
4	SDP	I have not always been honest with myself. (N)
5	SDP	I always know why I like things.
6	SDP	When my emotions are aroused, it biases my thinking. (N)
7	SDP	Once I've made up my mind, other people can seldom change my opinion.
8	SDP	I am not a safe driver when I exceed the speed limit. (N)
9	SDP	I am fully in control of my own fate.
10	SDP	It's hard for me to shut off a disturbing thought. (N)
11	SDP	I never regret my decisions.
12	SDP	I sometimes lose out on things because I can't make up my mind soon enough. (N)
13	SDP	The reason I vote is because my vote can make a difference.
14	SDP	My parents were not always fair when they punished me. (N)
15	SDP	I am a completely rational person.
16	SDP	I rarely appreciate criticism. (N)
17	SDP	I am very confident of my judgments.
18	SDP	I have sometimes doubted my ability as a lover. (N)
19	SDP	It's all right with me if some people happen to dislike me.
20	SDP	I don't always know the reasons why I do the things I do. (N)
21	IM	I sometimes tell lies if I have to. (N)

Item No.	Subscale	Item
22	IM	I never cover up my mistakes.
23	IM	There have been occasions when I have taken advantage of someone. (N)
24	IM	I never swear.
25	IM	I sometimes try to get even rather than forgive and forget. (N)
26	IM	I always obey laws, even if I’m unlikely to get caught.
27	IM	I have said something bad about a friend behind his or her back. (N)
28	IM	When I hear people talking privately, I avoid listening.
29	IM	I have received too much change from a salesperson without telling him or her. (N)
30	IM	I always declare everything at customs.
31	IM	When I was young I sometimes stole things. (N)
32	IM	I have never dropped litter on the street.
33	IM	I sometimes drive faster than the speed limit. (N)
34	IM	I never read sexy books or magazines.
35	IM	I have done things that I don’t tell other people about. (N)
36	IM	I never take things that don’t belong to me.
37	IM	I have taken sick-leave from work or school even though I wasn’t really sick. (N)
38	IM	I have never damaged a library book or store merchandise without reporting it.
39	IM	I have some pretty awful habits. (N)
40	IM	I don’t gossip about other people’s business.

Note. SDE = Self-Deceptive Positivity; IM = Impression Management; (N) = Negatively keyed item.

Appendix A-20: Ethics Approval – Study 3

AUSTRALIAN CATHOLIC UNIVERSITY

Human Research Ethics Committee

Committee Approval Form

Principal Investigator/Supervisor: BAFALLON Melbourne Campus

Co-Investigators: Melbourne Campus

Student Researcher: Chris Holt Melbourne Campus

Ethics approval has been granted for the following project:
Optimal Experience in the Workplace: Known Group Validation

for the period: 11.08.10 - 31.08.11

Human Research Ethics Committee (HREC) Register Number: V2010 90

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans* (2007) apply:

(i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
- security of records
- compliance with approved consent procedures and documentation
- compliance with special conditions, and

(ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
- proposed changes to the protocol
- unforeseen circumstances or events
- adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than low risk. There will also be random audits of a sample of projects considered to be of negligible risk and low risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: .... Date: ....11.08.2010.............
(Research Services Officer, Melbourne Campus)

Appendix A-21: Participant Information Sheet – Study 3

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

ACU National

Australian Catholic University Limited
ABN 15 050 192 660
Melbourne Campus (St Patrick's)
115 Victoria Parade Fitzroy VIC 3065
Locked Bag 4115 Fitzroy MDC VIC 3065
Telephone 613 9953 3000
Facsimile 613 9953 3005

INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT: Optimal Experience in the Workplace

PRINCIPAL SUPERVISOR: BARRY J FALLON

STUDENT RESEARCHER: CHRIS HOLT

PROGRAMME IN WHICH ENROLLED: PhD

Dear Participant,

You are invited to take part in a student research study which aims to validate a newly developed measure of the positive experiences of work..

There are no known risks, inconveniences and/or discomforts associated with completing this questionnaire. Should you however feel that this questionnaire is distressing in anyway please feel free to refer to the contact listed below for appropriate support/counselling.

To be involved in this study we invite you to complete an online questionnaire which can be accessed at: www.psychdata.com. This questionnaire should take approximately 30mins to complete.

As participants you may find this activity informative, insightful, and enjoyable. On a more general level this study will allow us to possibly validate this newly developed measure. Overall findings obtained from this study may be published in an appropriate psychological journal.

As a possible participant you are free to withdraw if you do not elect to submit your partially completed or completed questionnaire (once your response is submitted you are unable to withdraw your responses). By submission of the electronic questionnaire you are giving informed consent to participate in this research.

No identifying information is asked during the conduct of this study and as result confidentiality will be maintained at all times during the study and in any report or publication that arises from it. No attempt will be made to trace you as the participant completing this questionnaire. However, if you wish to enter into a draw to win 2 movie tickets for your participation in this research, if you win, you will be contacted to receive your movie tickets. To go into the draw to win, once completed the questionnaire you will be redirected to a page with a code which you will have to send to the researchers via email (cjholt001@myacu.edu.au). There will be a 1 in 50 chance of winning 2 movie tickets. You will not receive any further emails or be contacted again, and there will be no way of linking your submitted questionnaire to your email address if you chose to enter.

Any questions regarding this project should be directed to the Principal Supervisor or to the Student Researcher:

Mr Christopher J Holt
PHD Student

Professor Barry J Fallon
Principal Supervisor

Phone number: 9953 3108

Address: School of Psychology,
Australian Catholic University
115 Victoria Pde, Fitzroy Vic. 3065

For support/counselling should you find that this questionnaire is distressing in anyway please feel free to contact:

Dr Barbara Jones
PH: 9953 3464
Senior Lecturer
National School of Psychology

If you would like to obtain a report of the findings from this study please forward your email details to cjholt001@myacu.edu.au.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Investigator or Supervisor and Student Researcher has (have) not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee.

VIC: Chair, HREC
C/- Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.

Professor Barry Fallon	Christopher Holt
……………………………………	……………………………………
Principal Supervisor	Student Researcher

Appendix A-22: Ethics Approval – Studies 4, 5, and 6

AUSTRALIAN CATHOLIC UNIVERSITY

Human Research Ethics Committee

Committee Approval Form

Principal Investigator/Supervisor: BAFALLON Melbourne Campus

Co-Investigators: Melbourne Campus

Student Researcher: Chris Holt Melbourne Campus

Ethics approval has been granted for the following project:
Optimal Experience in the Workplace: Individual and Organisational outcomes to experiencing Flow at work

for the period: 11.08.10 - 31.08.11

Human Research Ethics Committee (HREC) Register Number: V2010 91

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans* (2007) apply:

(i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
- security of records
- compliance with approved consent procedures and documentation
- compliance with special conditions, and

(ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
- proposed changes to the protocol
- unforeseen circumstances or events
- adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than low risk. There will also be random audits of a sample of projects considered to be of negligible risk and low risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: .... Date: ....11.08.2010.............
(Research Services Officer, Melbourne Campus)

Life At Work Survey

Company A

Report 2011

Prepared by: Christopher Holt
PhD Student
Australian Catholic University
Email: chrisholt@internode.on.net

Contents

Page

1. Demographics Characteristics....259

2. Work Related Constructs....260

    2.1 Employee Engagement....260

    2.2 Job Performance....261

    2.3 Absenteeism....262

    2.4 Turnover Intentions....263

    2.5 Flow....264

    2.6 Conditions to Flow....265

3. Mental Health....269

    3.1 Well-Being....269

    3.2 Mental Illness....269

4. Conclusion and Recommendations....271

1. Demographic Characteristics

The data used in this report was collected from Company A in November 2010. In addition results from a convenient sample are also presented in this report; data for this sample was collected from Sept 2010 – March 2011.

Results from the convenient sample can be used to compare Company A employees to other employees in Australia on the same measures. This is ideal as normative data for a contemporary Australian population does not exist for the measures used in this study. In making comparisons, however, it is important to note that comparisons should be interpreted with some caution as this is a convenient sample of only 356 employees and therefore may not be representative of an Australian population. Comparing the demographics characteristics of the convenient sample with Company A data highlight the differences in the two samples and also reasons as to why comparisons should be interpreted with some caution.

Table 1. Demographic Characteristics of employees at Company A and Convenient Sample

	Company A	**Convenient Sample**
Number of employees (useable surveys)	46	356
Avg. Age of employees	44.85 (8.81)	39.68 (11.40)
Gender	13% Female	72 % Female
Avg. Weekly Hours Worked	41.02 (10.03)	37.80 (10.39)
Avg. Tenure	10.04 (8.81)	5.21 (6.32)
Education:		
Did not finish School	4.4%	2.5%
High School (Year 7-12)	26.7%	13.2%
Higher Education	28.9%	83%
Apprenticeship	40%	1.1%
Occupation Type:		
Manager	6.7%	10.9%
Professional	20%	42.2%
Technician/Trade Worker	33.3%	3.2%
Community and Personal Service Worker	2.2%	5.5%
Clerical and Administrative Worker	22.2%	24.4%
Sales Worker	0%	8.9%
Machinery Operations and Driver Worker	2.2%	0%
Labourer	8.9	1.1%
Not Specified	4.4%	3.1%

Please note: Values in brackets represent standard deviations.

As can be seen in the above table, differences between Company A and the convenient sample include:

(a) Gender: The Company A sample comprises a much larger number of males, while the convenient sample comprises a much larger number of females.
(b) Tenure: In the Company A sample the average tenure is close to twice that of convenient sample.

(c) Education level: Company A sample has large number of employees who have completed an apprenticeship qualification whereas convenient sample has large number of employees who have completed higher education.

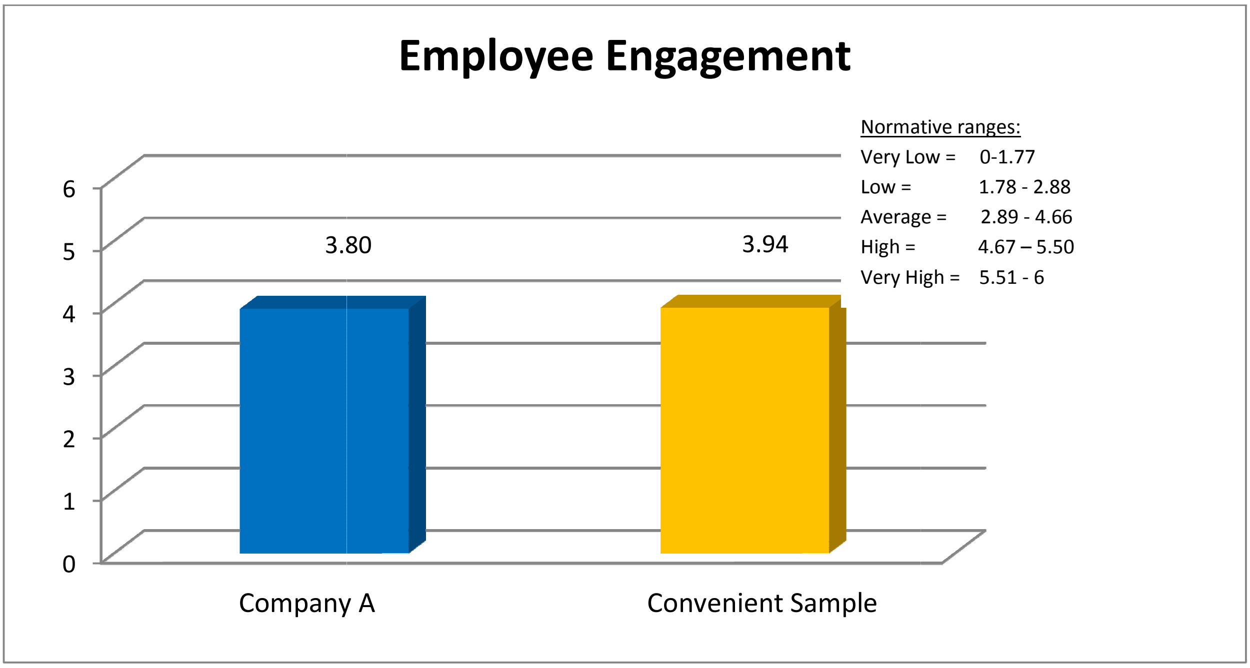
(d) Occupation type: Company A sample has a large number of technician and trader workers were as the convenient sample consists of only a very small number.

2. Work Related Constructs

2.1 Employee Engagement

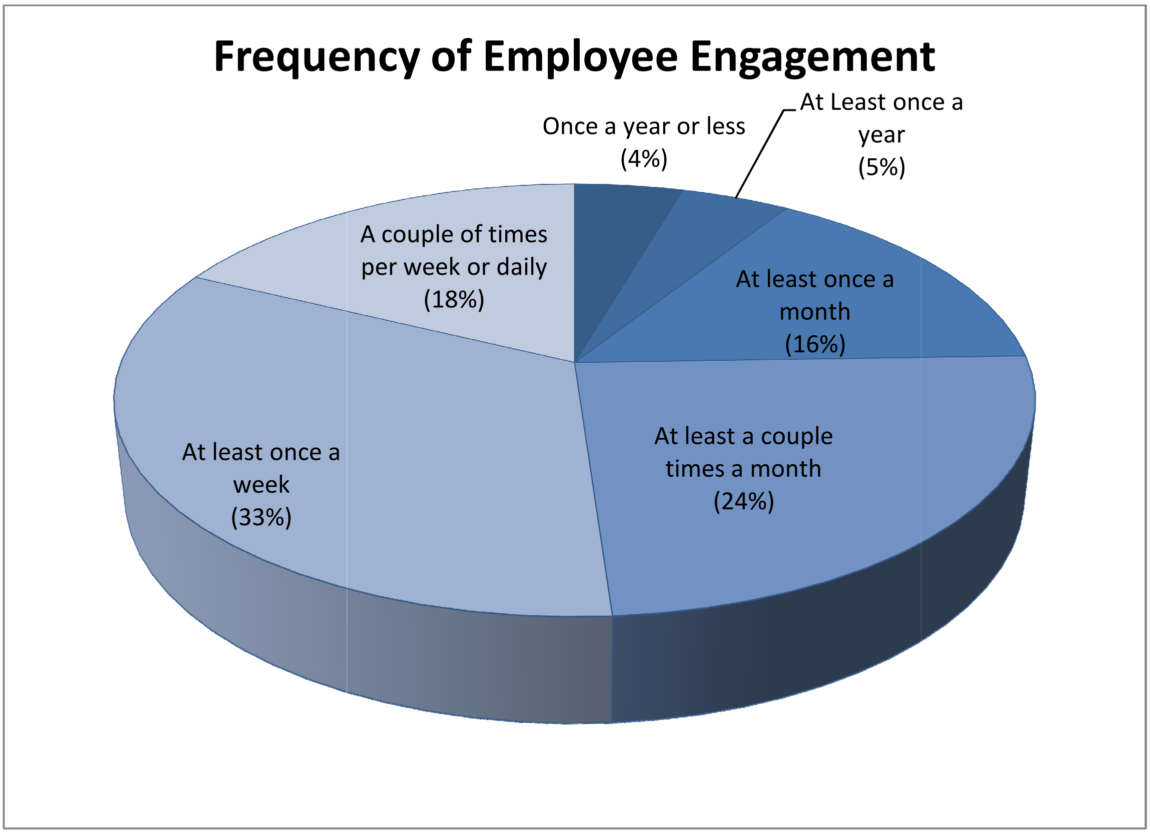
Defined as:

> "... a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication, and absorption. Vigour is characterised by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterised by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work" (Schaufeli & Bakker, 2003, pp. 4-5).



As can be seen from the above figure, Company A employee's score within the average normative range for employee engagement and slightly lower than convenient sample.

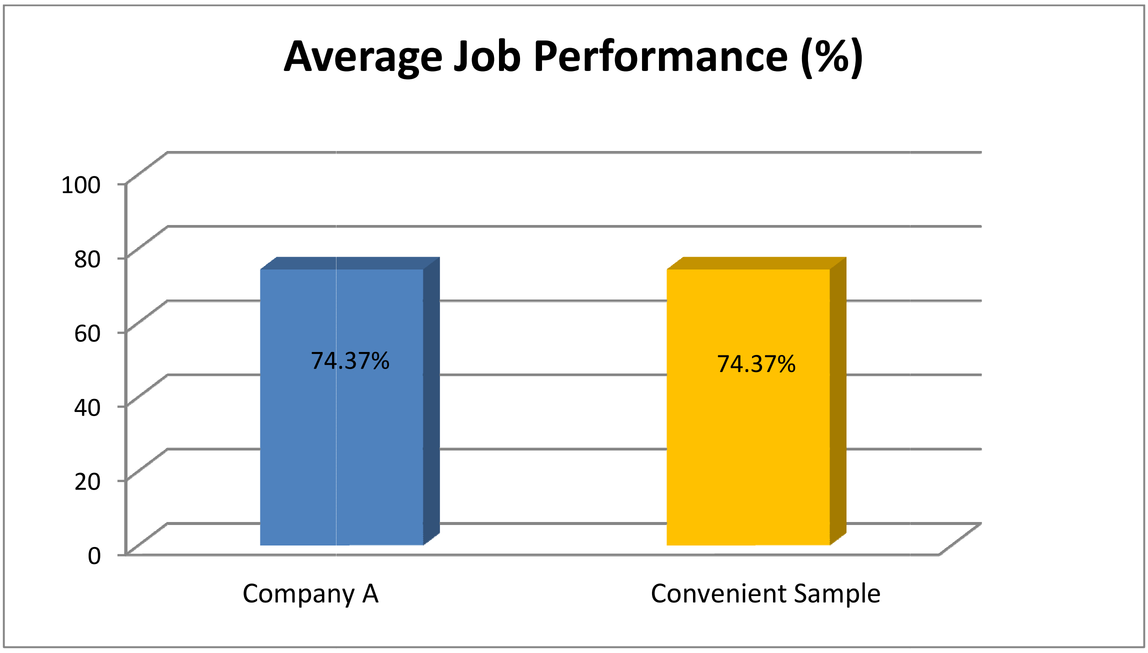
The figure below shows the frequency of employee engagement amongst Company A employees.



It can be seen from the above figure, that the majority of employees feel engaged at least a couple of times a month to at least once a week.

2.2 Job Performance

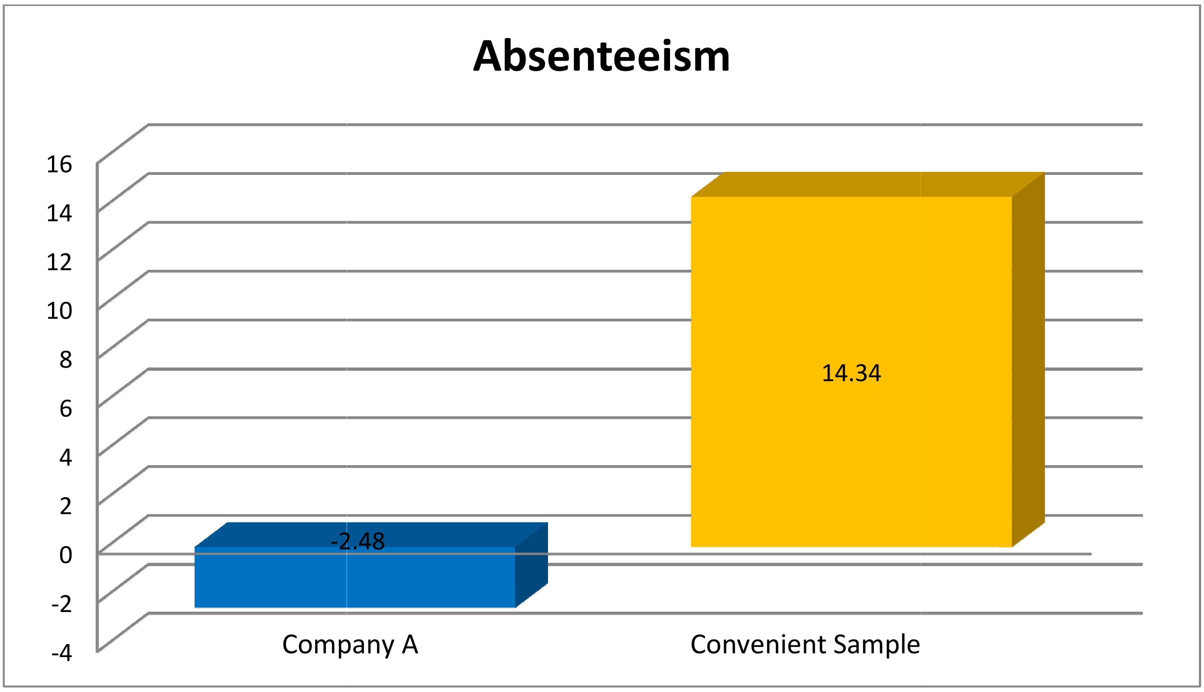
Job performance was measured by asking participants to rate how they performed at work over the last 4 weeks. Employees used a scale from 0-10 to rate their performance, where 0 represents the worst possible performance and 10 represents the performance of a top worker. In addition, to help reduce possible desirable responding, employees were also asked to rate, using the same scale, how their peers and also how their supervisor would rate their performance. Scores from these three ratings (employee, peers and supervisor) were averaged and converted into percentages to represent job performance.



As can be seen from the above figure, average job performance for Company A's employees is no different from the convenient sample. For Company A employees job performance ratings varied from 26.67 – 100%.

2.3 Absenteeism

Absenteeism was measured as the difference between how many hours employees were expected to work in the past 4 weeks and how many hours employees actually worked in the past 4 weeks.

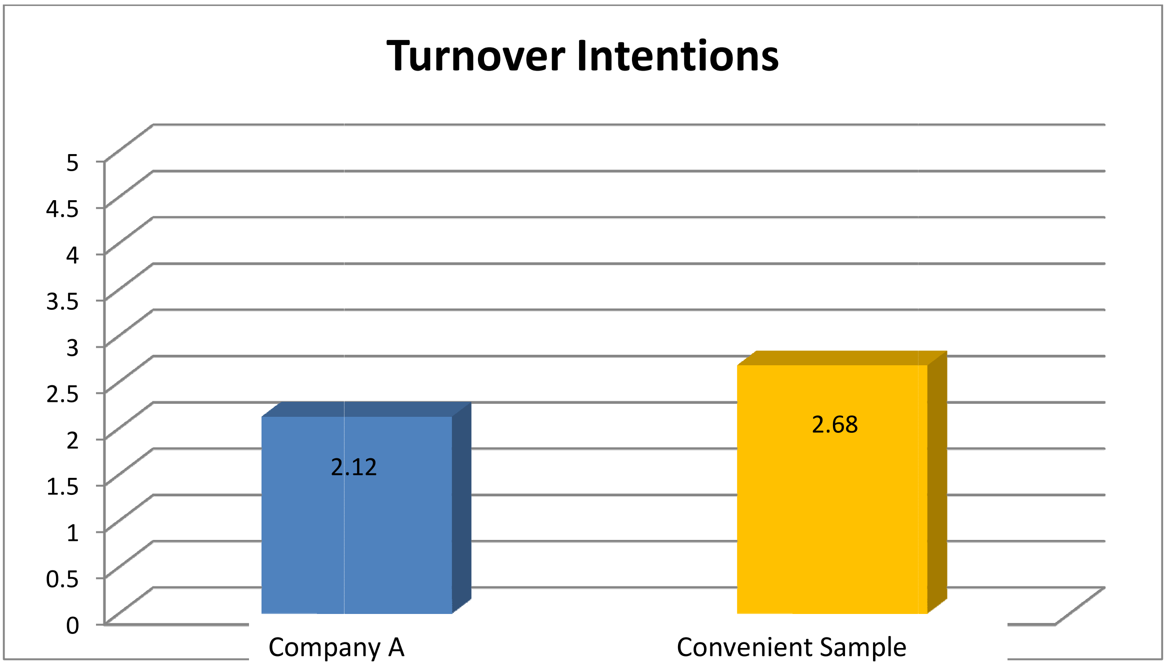


As can be seen from the above figure (see previous page, 2nd figure), average absenteeism levels are in the negative for Company A. This means that, on average, employees over the 4 week responding period worked an extra 2.48 hours more than expected. This is quite different to the convenient sample, where, on average, 14 hours were lost for each employee over the 4 week responding period.

For Company A, the range of hours worked highly varied, from 166 hours more than expected to 117 hours less than expected, a high variation in hours worked was also found in the convenient sample. For Company A employees, 41 percent of employees worked less than their expected work hours, 23% worked their expected work hours and 36 % worked more than their expected work hours, over the 4 week responding period.

2.4 Turnover Intentions

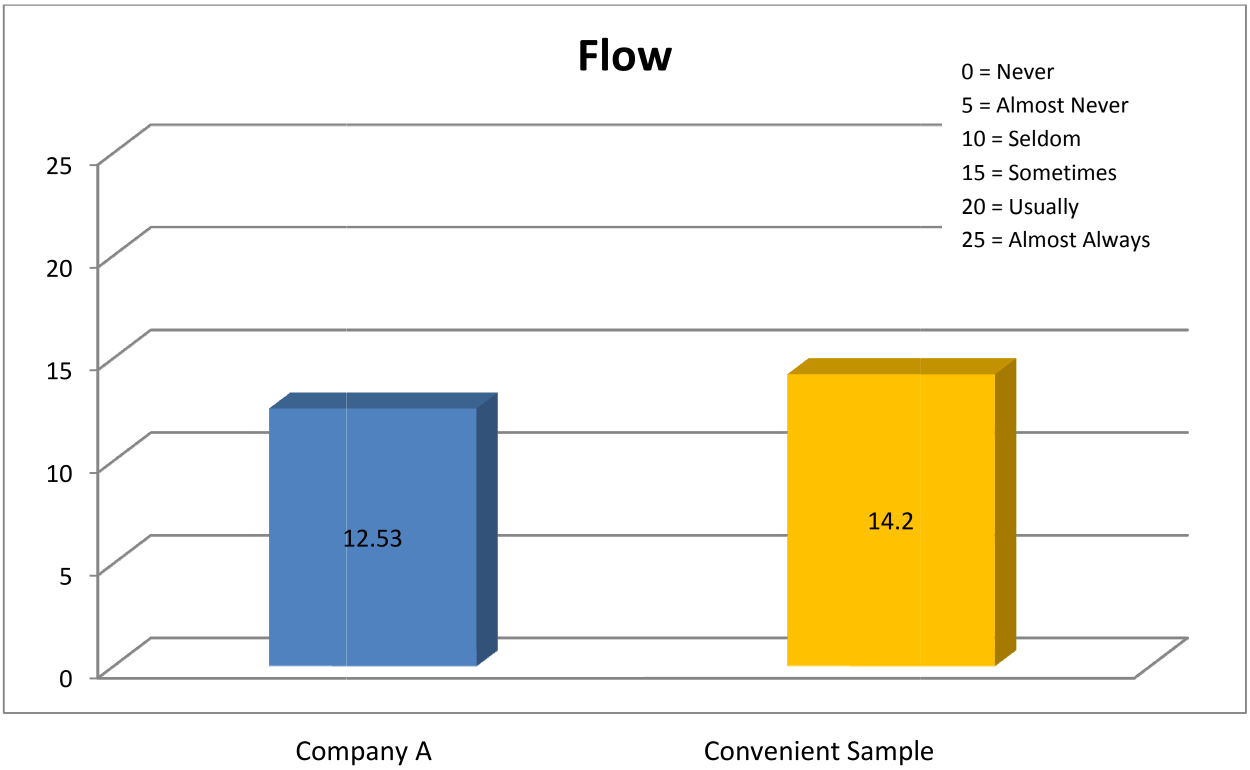
The figure below indicates average employee turnover intentions for both Company A and Convenient samples. A score above 3 indicates intent to leave, a score of 3 indicates 'neither agree nor disagree' and a score below 3 indicates disagreement with intent to leave.



The above figure shows that Company A employees, on average, rate lower on intent to leave compared to the convenient sample. For Company A employees, 78% of employees do not intend to leave ('disagree' or 'strongly disagree'), 7% are not sure ('neither agree nor disagree') and 15% may be intending to leave ('agree' or 'strongly agree').

2.5 Flow experience

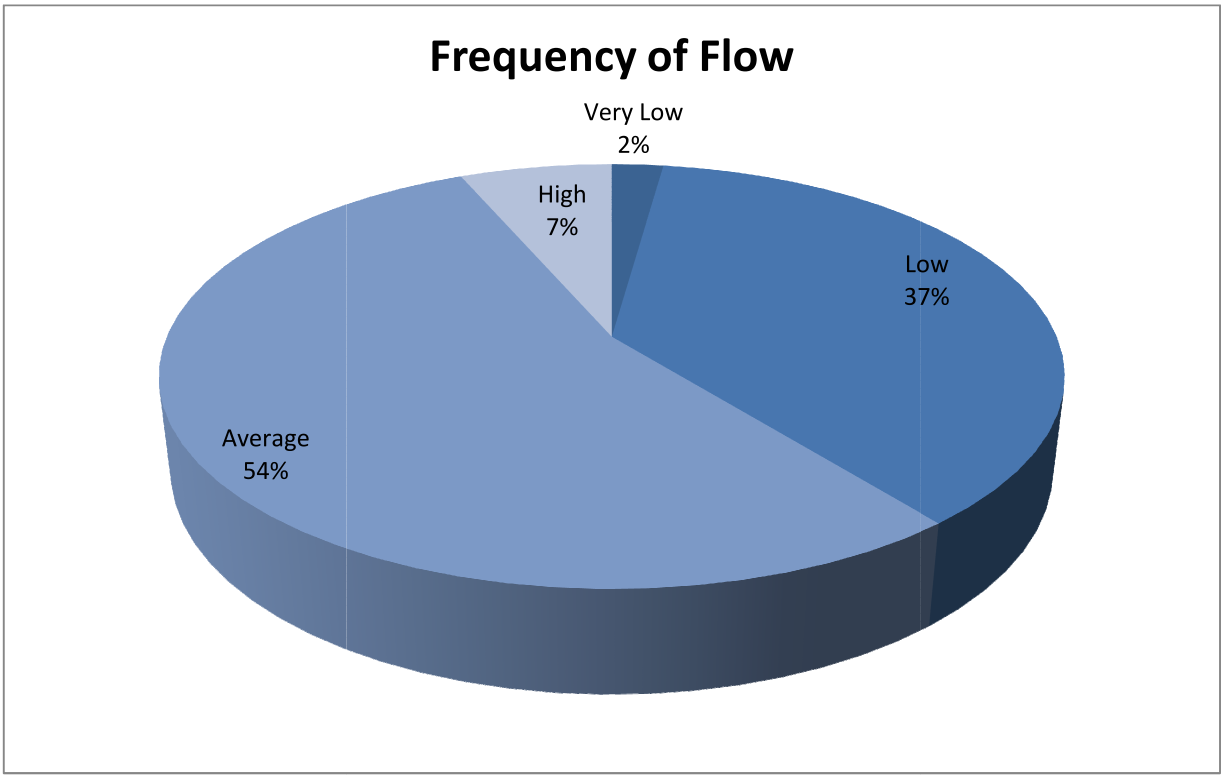
Flow is defined as a state of complete involvement with the activity at hand, where the activity presents constant challenges utilising a person's skills in full, he/she feels in control, receives clear feedback regarding actions, actions seems to occur automatically without conscious thought, there is little distinction between self and environment, between activity and action, or between past present and future , there is no experience of boredom or worry (Csikszentmihalyi, 1975). This experience represents 'pure enjoyment' in that the activity is undertaken because it is enjoyable in itself, the activity is carried out regardless of external reward i.e. financial reward, prestige or fame.



It can seen from the above figure that Company A employees, on average, experience flow slightly less often than the convenient sample. A top score of 25 on the flow score, means that flow is experienced almost always, where as a zero score indicates that flow is never experienced. Both Company A and the convenient sample have average scores that lie between 'Seldom' and 'Sometimes'.

The following figure shows the frequency of flow, in categories, amongst Company A employees. The following categories were calculated from percentile ranges using the convenient sample data:

Level of Flow	Lower limit percentile	Upper limit percentile
Very Low	0%	4.99%
Low	5%	24.99%
Average	25%	74.99%
High	75%	94.99%
Very High	95%	100%



As can be seen from the above figure, more than half experience average to high levels of flow, whereas only 2% and 37% experience very low and low amounts of flow respectively.

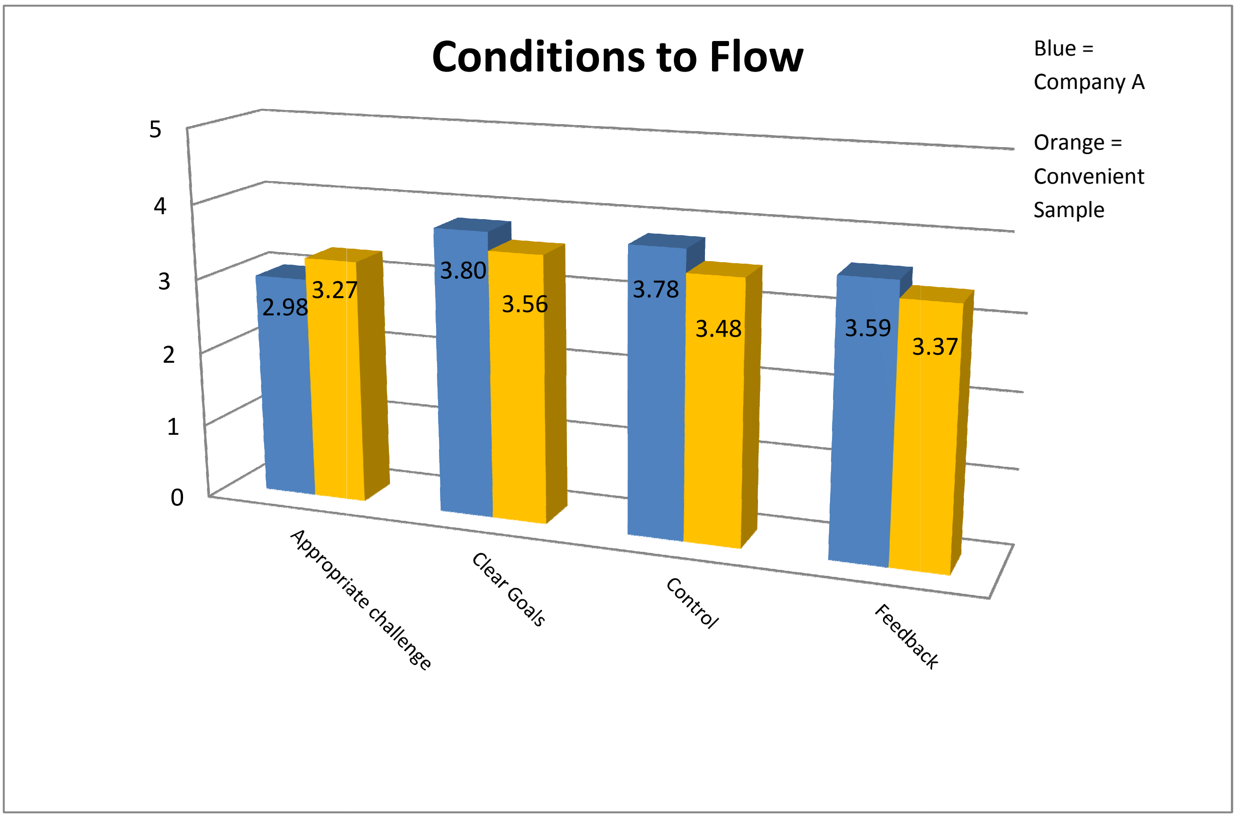
2.6 Conditions to Flow

There are four conditions which are said to facilitate the flow experience. They include:

a) Appropriate balance between challenge and skill - stretching of skills at an appropriate level that does not over-challenge the individual.
b) Clear Goals- goals are clear and provide information as to how one is to carry out the task at hand.

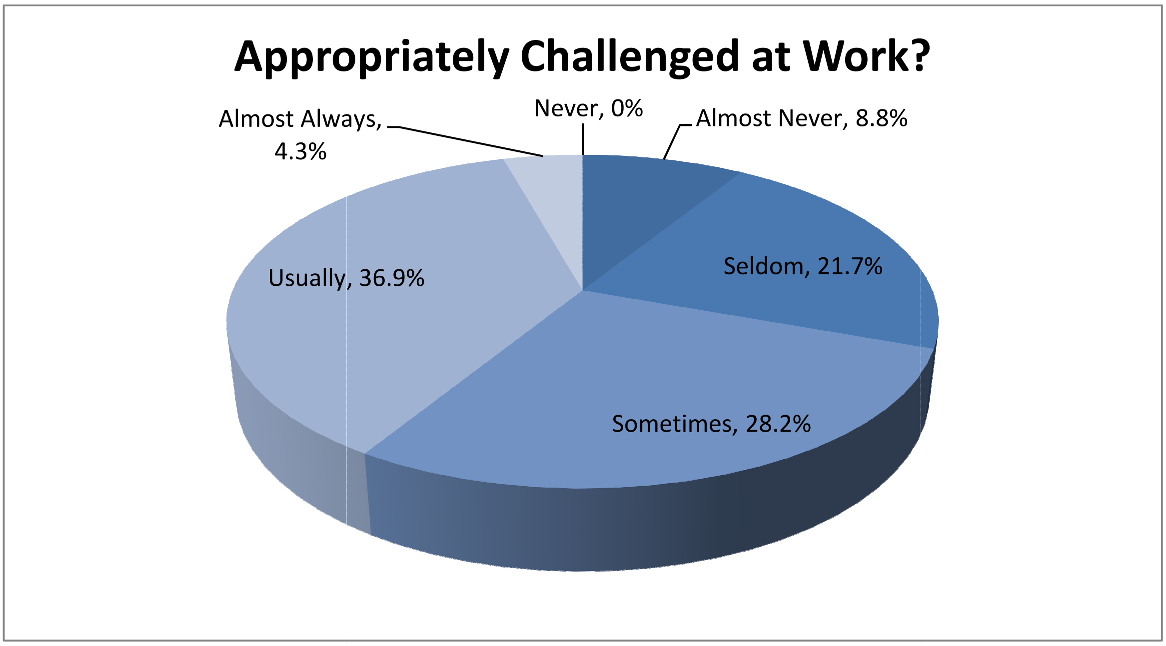
c) Feedback - unambiguous feedback that is used to determine how one is succeeding in their work.
d) Control - employees believe they have control of their work and are not worried about work becoming out of control.

The following figure shows employee averages for the four conditions to flow, for both Company A and convenient samples.

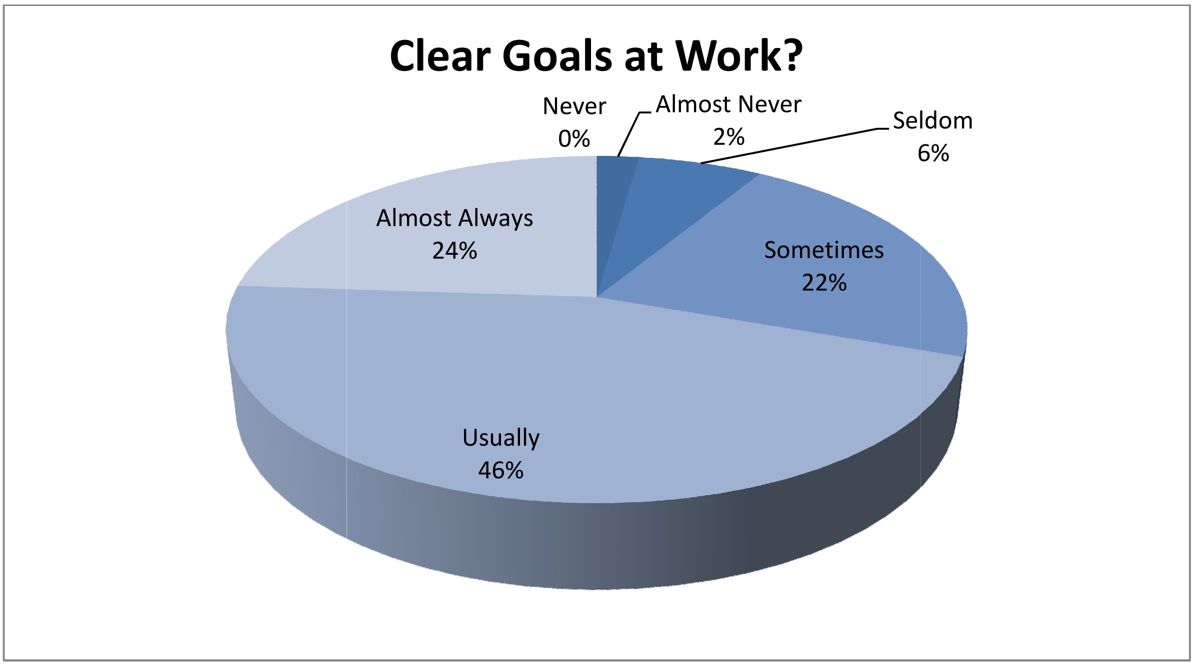


As can be seen from the above figure, the Company A sample does not vary much from the convenient sample. Company A employees experience slightly less appropriately challenging activities and slightly more clear goals, feelings of control and feedback.

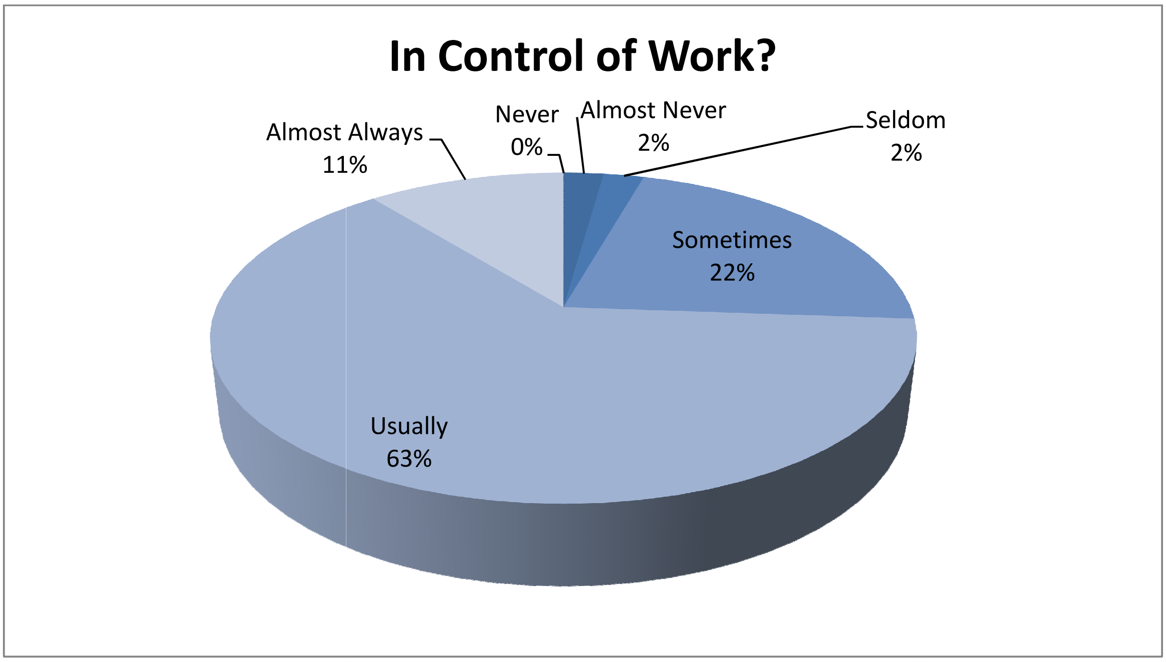
The figures on the following two pages show how often Company A employees experience the conditions to flow, represented as categories. Obtained scores for the conditions to flow were rounded to the nearest scale anchors (1='almost never', 2= 'seldom', 3= 'sometimes', 4 ='usually' & 5 ='Almost Always'). A score of less than .5 was rounded up to the 'almost never' anchor as this implies that the employee experienced that condition - it would be inaccurate to round a score to the 'never' anchor.



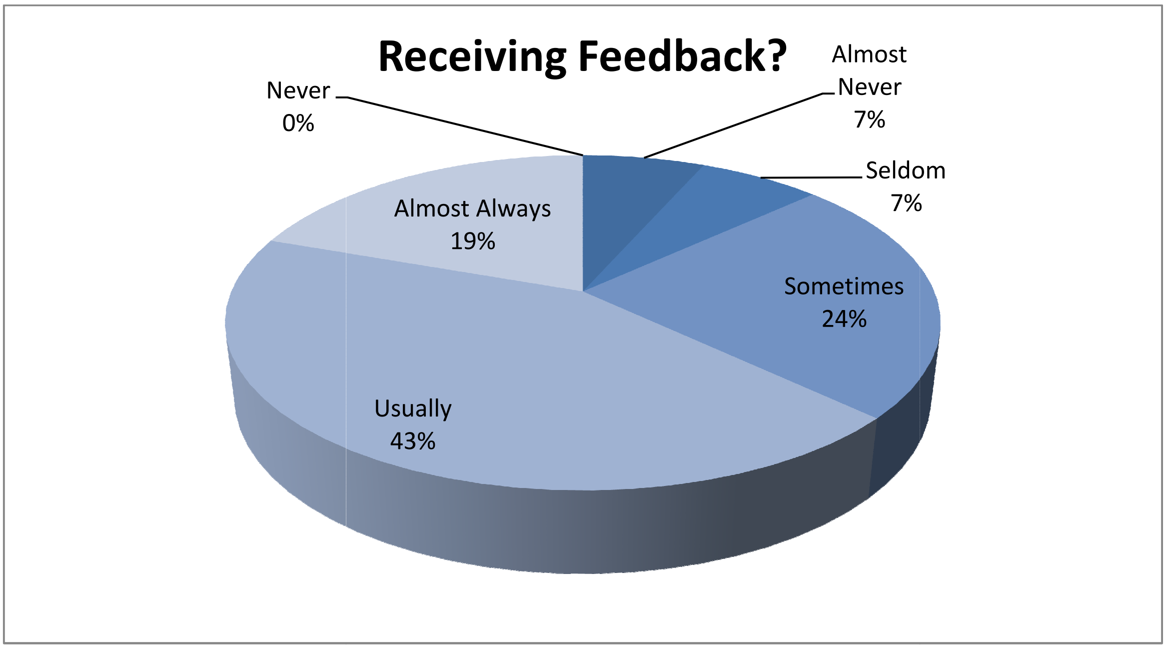
The above figure shows that just over 40% report that they ‘usually’ or more frequently felt appropriately challenged, whereas just under 60% report feeling appropriately challenged ‘sometimes’ or less often at work.



The above figure shows that 70% ‘usually’ or more frequently have clear goals at work whereas 30% report having clear goals ‘sometimes’ or less frequently at work.



The above figure shows that close to 75% reported feeling in control ‘usually’ or more often, whereas just over 25% reported feeling in control ‘sometimes’ or less often at work.



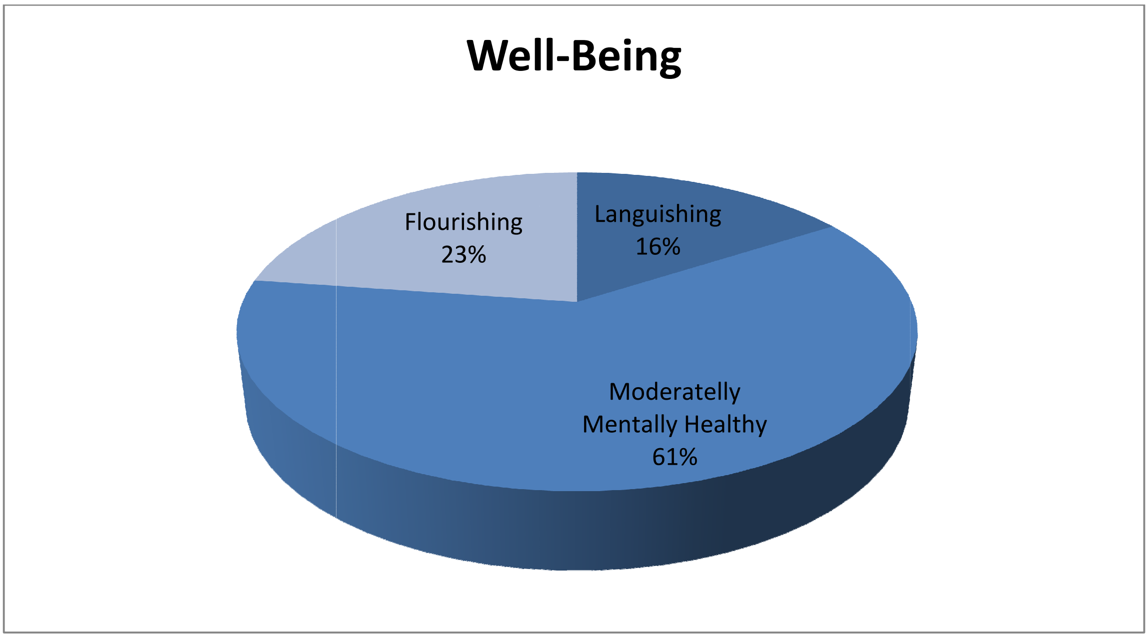
The above figure shows that just over 60% reported that they knew how they were performing ‘usually’ or more often, whereas less than 40% reported that they knew how they were performing ‘sometimes’ or less often at work.

3. Mental Health

3.1 Well-Being

Well-Being (mental health) is defined here not as the absence of mental illness but rather a high level of performance of mental functioning, productive activity, fulfilling relationships with people, and the ability to change and cope with adversity (U.S. Department of Health and Human Services, 1999). Well-Being in this report has been classified into three categories: flourishing, moderately mentally healthy, and languishing. People who are flourishing are those who have positive feelings about life and are functioning well psychologically and socially (Keyes, 2002). People who are languishing tend to have negative feelings about life, are not functioning well psychologically and socially. Moderately mentally healthy are those who are neither flourishing nor languishing in life (Keyes, 2002).

The following figure shows the percentage of Company A employees who either flourishing, moderately mentally healthy or languishing.

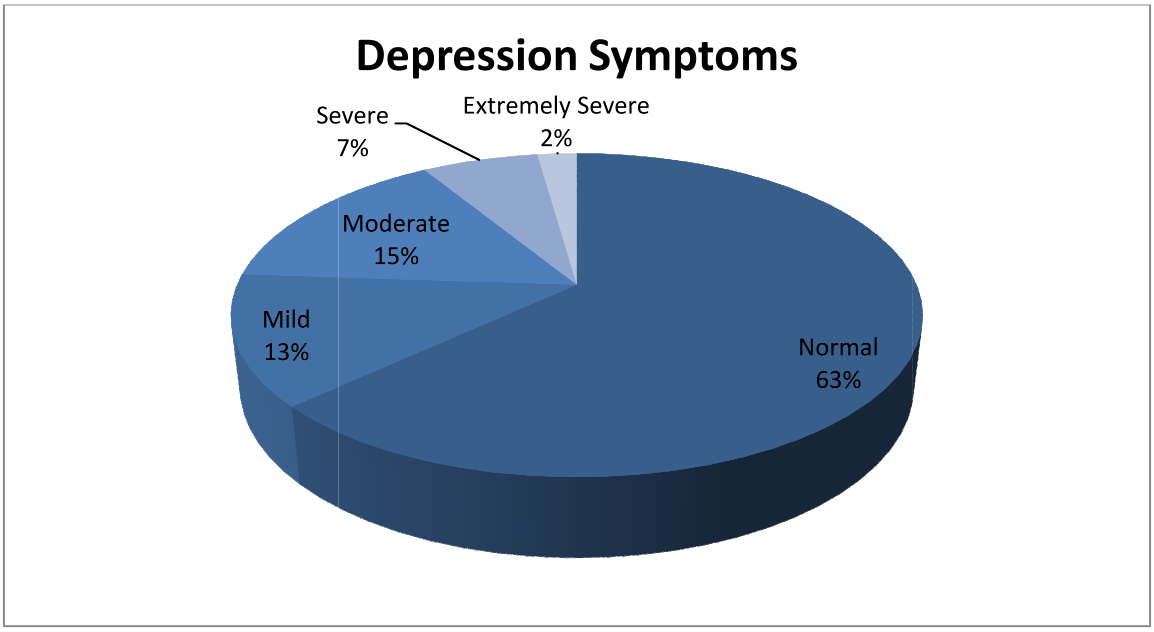


As can be seen from the above figure, a large proportion of employees have either average or high levels of well-being with only a small percentage of employees having low levels of well-being. In comparison to the employees in the convenient sample, more Company A employees are in the moderately mentally healthy category and less are in the languishing category.

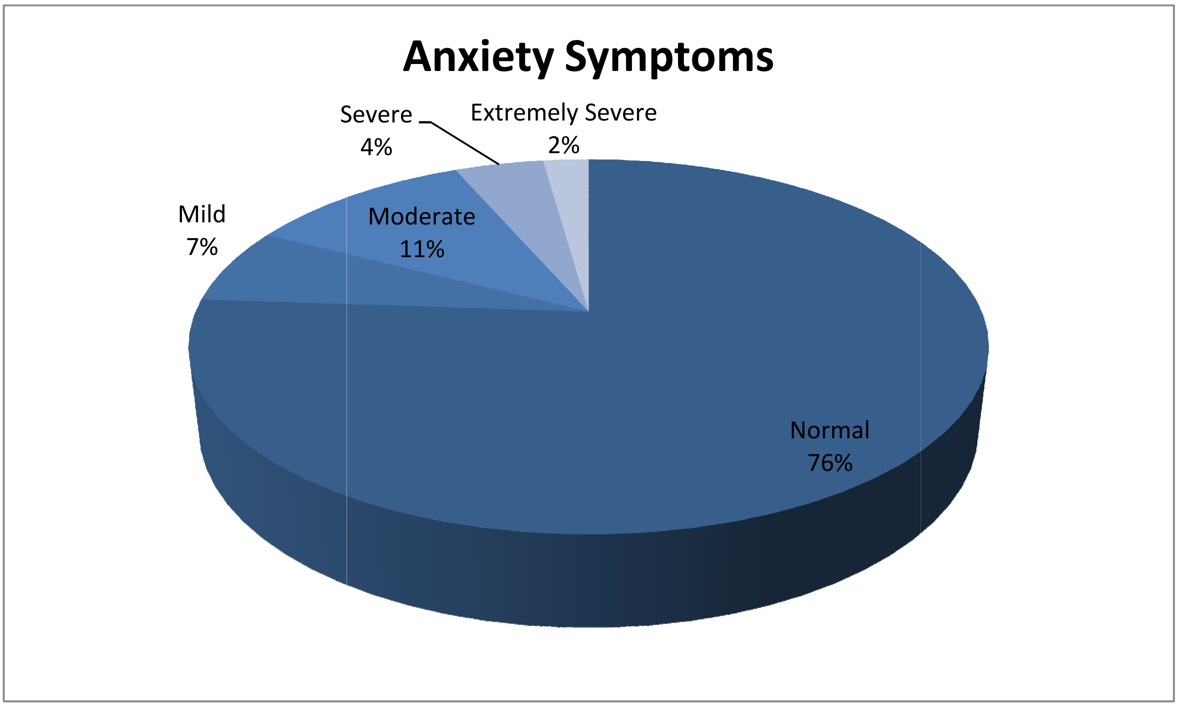
3.2 Mental Illness

The following three figures show symptoms for depression, anxiety and stress based on severity ranges used by the DASS (Depression, Anxiety and Stress Scales) respectively. Please note that the severity labels are used to describe the full range of scores within the population, thus for example someone who scored in the mild range will be above the population mean, however is still likely to be well below meeting a diagnosis for clinical disorder (Lovibond & Lovibond, 1995).

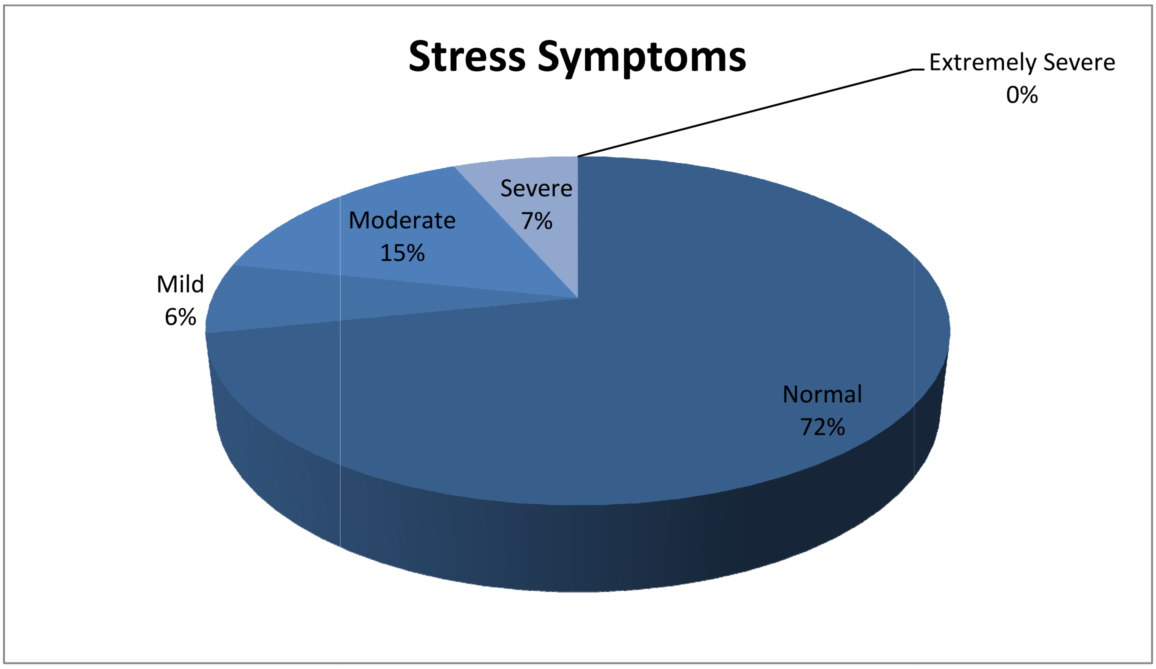
The Depression scale measures feelings of dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia (Lovibond & Lovibond, 1995).



The anxiety scale measures autonomic arousal, skeletal muscle effects, situational anxiety, and subject experience of anxious affect (Lovibond & Lovibond, 1995).



The stress scale measures difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient (Lovibond & Lovibond, 1995).



In terms of depression, anxiety and stress, the above three figures show that for most employees' depression, anxiety and stress symptoms are in the mild to normal range. Similar results, in terms of percentages of severity ranges, were also found in the convenient sample for depression, anxiety and stress symptoms.

4. Conclusion and Recommendations

Overall the results for both work outcomes and employee mental health are quite good. For Company A employees, average engagement levels are within normal range, job performance levels are high, overall absenteeism appears to be good - on average more hours are worked than expected. Turnover intentions are good with only a small percentage intending to leave. Having a small percentage intending to leave may suggest that most are satisfied with their jobs and working conditions. With regard to flow experiences, just over half experience average or higher amounts of flow at work.

There are two strategies for increasing flow experiences and employee engagement levels; restructuring tasks to make them more conducive to flow and also teaching employees how to experience flow.

The first strategy, restructuring tasks, may not always be possible or feasible, for instance it may not be possible to give employees more control in a certain role, but there may be other conditions that are easier to incorporate into tasks i.e. increasing feedback, or providing clear goals.

The second strategy, teaching employees how to experience flow, can be achieved by educating employees about flow; teaching employees the importance of setting clear and regular goals, how to identify and recognise feedback in their roles and the importance of being appropriately challenged to avoid boredom and anxiety. In addition, teaching employees how to better control their consciousness so that everyday worries and frustrations (that typically absorb a large amount of available psychic energy) can be forgotten, can help employees become more focused at work and may likely result in more flow experiences. These strategies may be best taught by someone who has a good conceptual understanding of flow and the conditions necessary for it or who is experienced in delivering flow interventions.

In terms of mental health, by providing more of the appropriate conditions that are conducive to flow and/or by better educating employees about flow and the conditions necessary for it, more employees may likely experience more flow. In turn, it is likely that well-being levels may also improve, as being in flow is very much an enjoyable experience and seen as the secret to a happy life (R. G. Mitchell, Jr., 1988).

With mental illness, it was found that some employees reported severe and even extremely severe symptoms of depression, anxiety and stress. If not already available, appropriate resources should be made available to enable employees to seek support. The *beyondblue* website http://www.beyondblue.org.au has a large amount of information on mental illness and treatment options, and many useful materials (i.e. information handouts and booklets) that can be ordered through their website and distributed to employees

When interpreting these results, it is important to note that all data was derived from self-administered questionnaires and therefore may not be an accurate representation of concepts measured. For instance, social desirable responding may have influenced responses to some degree. The findings also may not be representative of all employees at Company A as only one site containing 800 employees were invited to participate, with 5.75% of those who were invited, volunteering to participate.

Lastly, if not already in place, ongoing monitoring of mental health in the workplace and employee engagement/flow levels should occur. It is well known now, but often ignored, that employees are an organisations greatest asset, and if they themselves are not functioning well (psychologically, socially and emotionally), it is difficult to imagine how they could be performing well at work.

I would like to sincerely thank Company A and all those who took the time out their busy lives to participate in this important study, your support is very much appreciated.

References:

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.
Keyes, C. L. M. (2002). The Mental Health Continuum: From Languishing to Flourishing in Life. *Journal of Health and Social Behavior, 43*(2), 207-222.
Lovibond, S. H., & Lovibond, P. F. (1995). Manual for the Depression Anxiety Stress Scales (2nd. Ed.). Sydney: Psychology Foundation.
Mitchell, R. G., Jr. (Ed.). (1988). *Sociological implications of the flow experience*. New York: Cambridge University Press.
Schaufeli, W. B., & Bakker, A. (2003). UWES: Utrecht Work Engagement Scale *Preliminary Manual* (pp. 58): Occupational Health Psychology Unit, Utrecht University.
U.S. Department of Health and Human Services. (1999). Mental Health: A report of the Surgeon General. Rockville, MD.

Appendix A-24: Brief Company Report for Company B

Life at Work Survey

Company B

Report 2011

Prepared by: Christopher Holt
PhD Candidate
Australian Catholic University
Email: chrisholt@internode.on.net

Prof. Barry Fallon
Deakin University
Email: barryjfallon@gmail.com

Contents

Page

1. Executive Summary........276

2. Demographics Characteristics........277

3. Work Related Constructs........278

    3.1 Employee Engagement........278

    3.2 Job Performance........279

    3.3 Absenteeism........280

    3.4 Turnover Intentions........281

    3.5 Flow........282

    3.6 Conditions to Flow........283

4. Mental Health........285

    4.1 Well-Being........285

    4.2 Mental Illness........286

5. Conclusion........288

    5.1 Recommendations........289

    5.2 Limitations of Survey........290

1. Executive Summary

This report was instigated as Company B responded to an invitation that went out to many organisations to help provide data for PhD research into employee's experience of work, employee functioning and mental health. In return for their participation, the researchers agreed to provide Company B with this brief report. The key findings are highlighted below:

- engagement levels are within the average range
- absenteeism and intention to leave appear to be normal compared to an Australian sample of employees
- approximately 90% of employees experience average or higher levels of flow
- just under 80% are experiencing moderate to higher levels of well-being
- mental illness is not a great issue – around 80% experience normal to mild levels of stress, anxiety and depression, with the majority in the normal range

It is important to note that the findings from this report may not be representative of all employees at Company B as only employees within the National office were invited to participate, with approximately 16% of those invited, volunteering to participate.

2. Demographic Characteristics

The data from Company B, used in this report, was collected from January to March 2011. In addition, results from a convenient sample are also presented in this report for comparison purposes. Data for the convenient sample was collected from September 2010 – March 2011.

Results from the convenient sample are used to compare Company B employees to other Australian employees on the same measures. This is ideal as normative data for a contemporary Australian population does not exist for the measures used in this study. In making comparisons however, it is important to interpret results with some caution as this is a convenient sample of only 296 employees and therefore may not be representative of an Australian population. Comparing the demographic characteristics of the convenient sample with the Company B sample highlights both the similarities and differences, and reasons as to why comparisons should be interpreted with some caution.

Table 1. Demographic Characteristics of employees at Company B and Convenient Sample

	Company B	**Convenient Sample**
Number of employees (useable surveys)	106	296
Avg. Age of employees	36.10 (10.50)	41.73 (11.64)
Gender	64% Female	66 % Female
Avg. Weekly Hours Worked	42.14 (7.26)	36.75 (10.96)
Avg. Tenure (years)	4.31 (5.83)	6.29 (7.09)
Education:		
Did not finish School	3.8%	2.3%
High School (Year 7-12)	14.3%	14.9%
Higher Education	80.0%	76.0%
Apprenticeship	1.9%	6.8%
Occupation Type:		
Manager	10.9%	10.3%
Professional	38.6%	40.8%
Technician/Trade Worker	0.0%	8.9%
Community and Personal Service Worker	0.0%	6.8%
Clerical and Administrative Worker	47.5%	22.9%
Sales Worker	0.0%	2.4%
Machinery Operations and Driver Worker	0.0%	0.3%
Labourer	0.0%	2.7%
Not Specified	3.0%	4.9%

Please note: Values in brackets represent standard deviations.

As can be seen in the above table, it is important to note the differences between Company B and the convenient sample, these include:

(e) Tenure: The average tenure in the Company B sample is close to 2 years lower than that of the convenient sample.

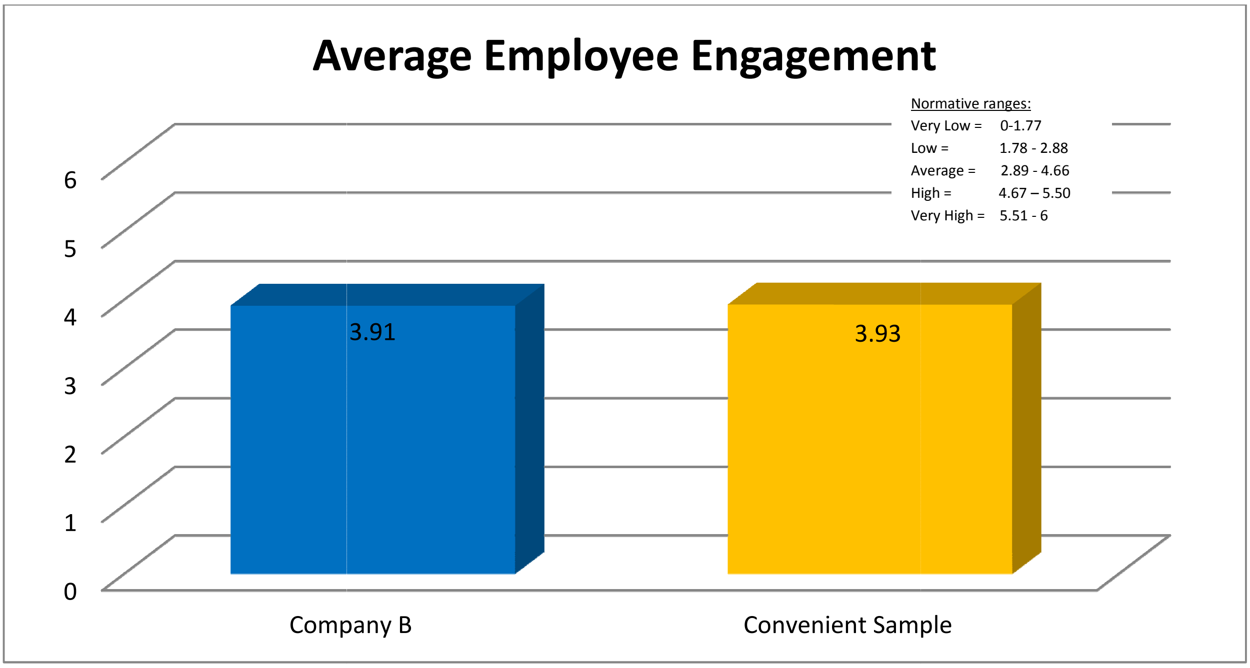
(f) Occupation type: Company B's sample consists of mangers, professionals, and clerical and administrative workers, whereas the convenient sample also consists of other differing occupation types.

3. Work Related Constructs

3.1 Employee Engagement

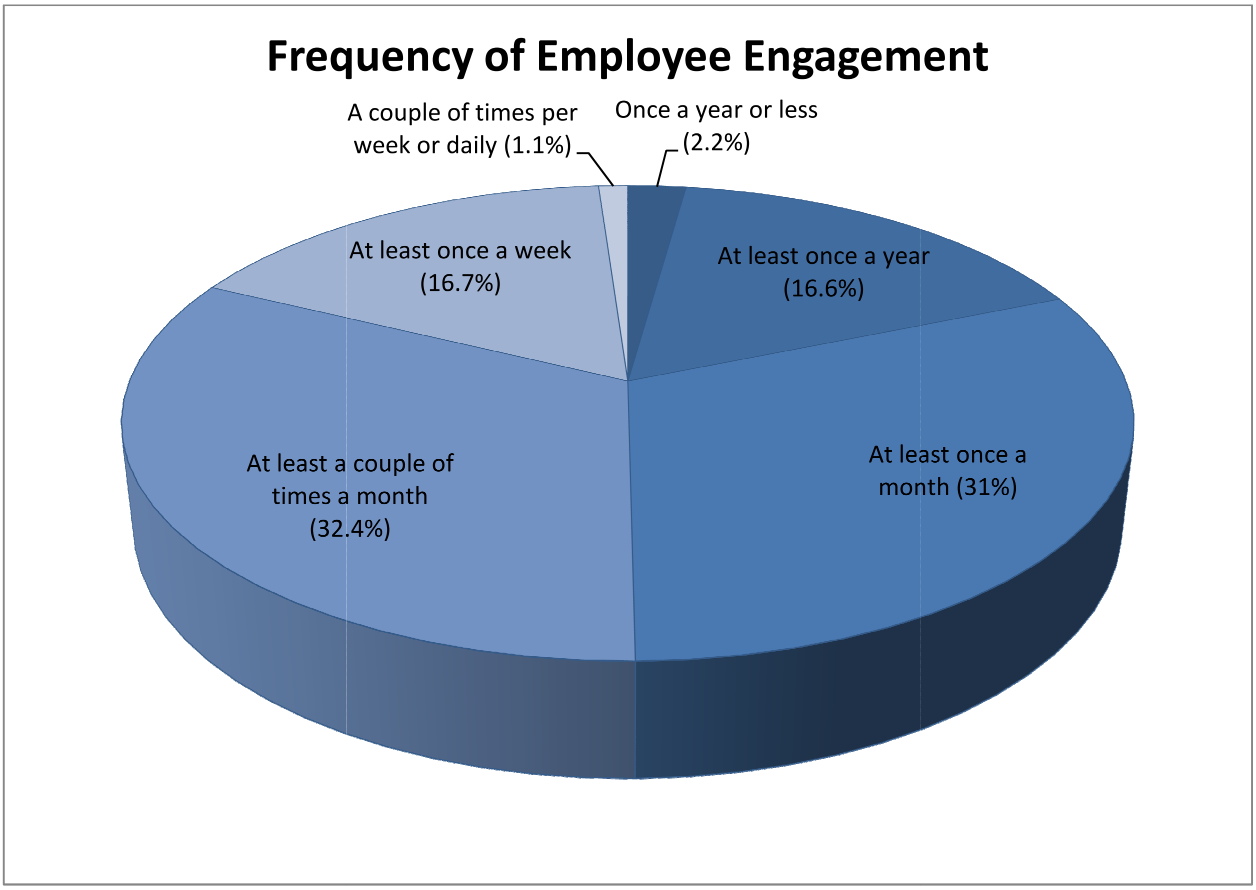
Defined as:

> "... a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication, and absorption. Vigour is characterised by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterised by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work" (Schaufeli & Bakker, 2003, pp. 4-5).



As can be seen from the above figure, the average Company B employee engagement score is within the average normative range for employee engagement and is not substantially different to that of the convenient sample.

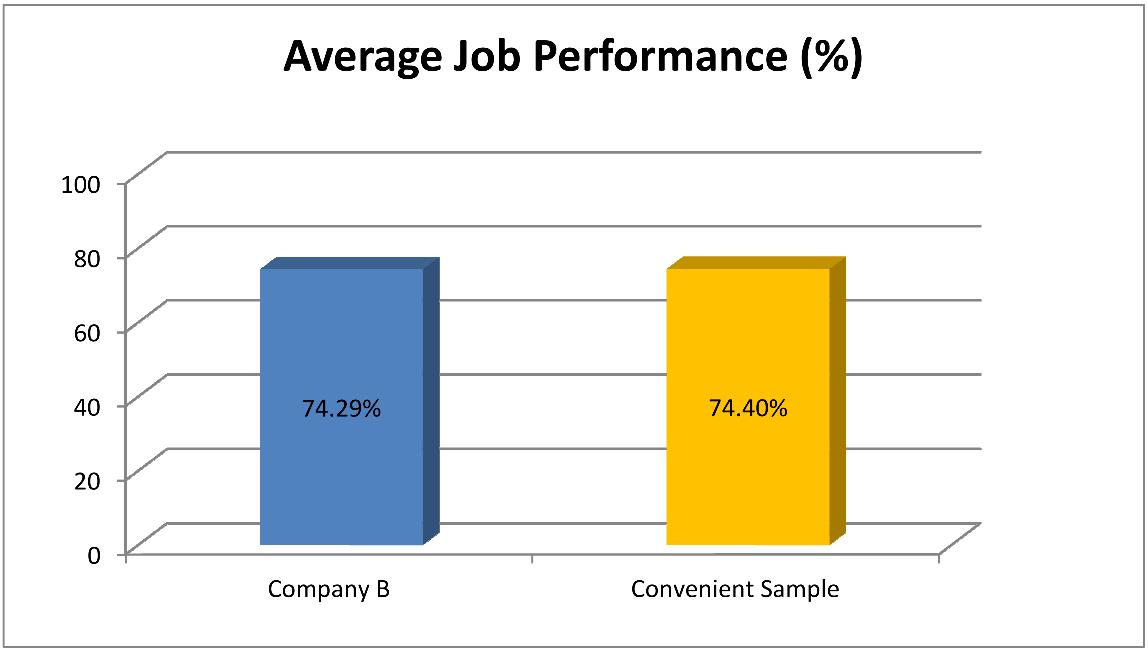
The figure below shows the frequency of employee engagement amongst Company B employees.



It can be seen from the above figure that approximately half of Company B employees feel engaged at least a couple of times a month to a couple of times per week or daily.

3.2 Job Performance

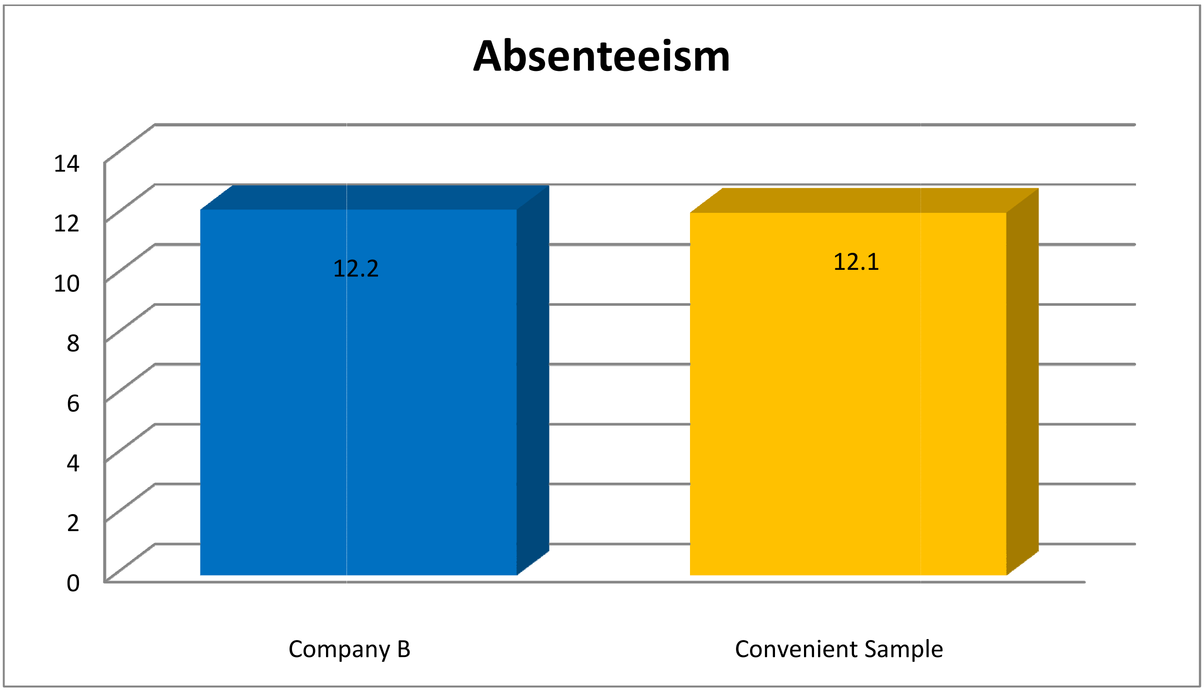
Job performance was measured by asking participants to rate how they performed at work over the last 4 weeks. Employees used a scale from 0 to 10 to rate their performance, where 0 represents the worst possible performance and 10 represents the performance of a top worker. In addition, to help reduce possible desirable responding, employees were also asked to rate, using the same scale, how their peers and also how their supervisor would rate their performance. Scores from these three ratings (employee, peers and supervisor) were averaged and converted into percentages to represent job performance.



As can be seen from the above figure, the average job performance level for Company B employees is not different from the convenient sample. For Company B employees, job performance ratings varied from 40% to 100%.

3.3 Absenteeism

Absenteeism was measured as the difference between how many hours employees were expected to work in the past 4 weeks and how many hours employees actually worked in the past 4 weeks.

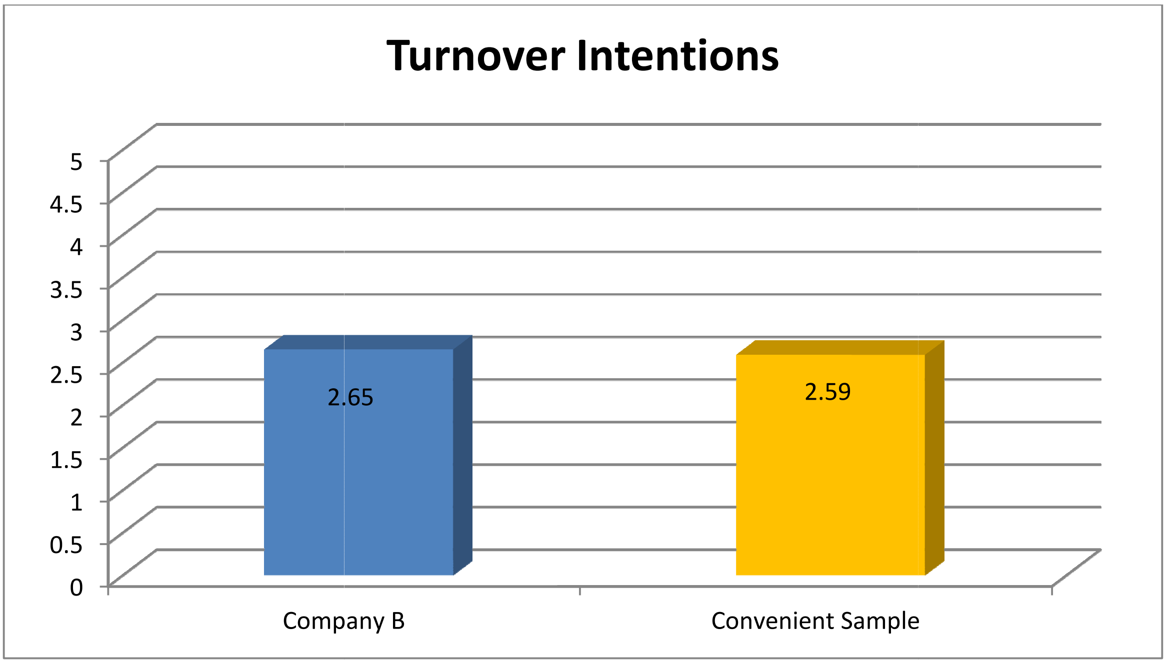


As can be seen from the above figure (see previous page, 2nd figure), average absenteeism levels are no different to that of the convenient sample.

For Company B, the range of hours worked varied considerably, from 72 hours more than expected to 160 hours less than expected over the 4 week period. A large variation in hours worked was also found in the convenient sample. For Company B employees, 40.2% of employees worked less than their expected work hours, 23% worked their expected work hours and 36.8% worked more than their expected work hours, over the 4 week responding period.

3.4 Turnover Intentions

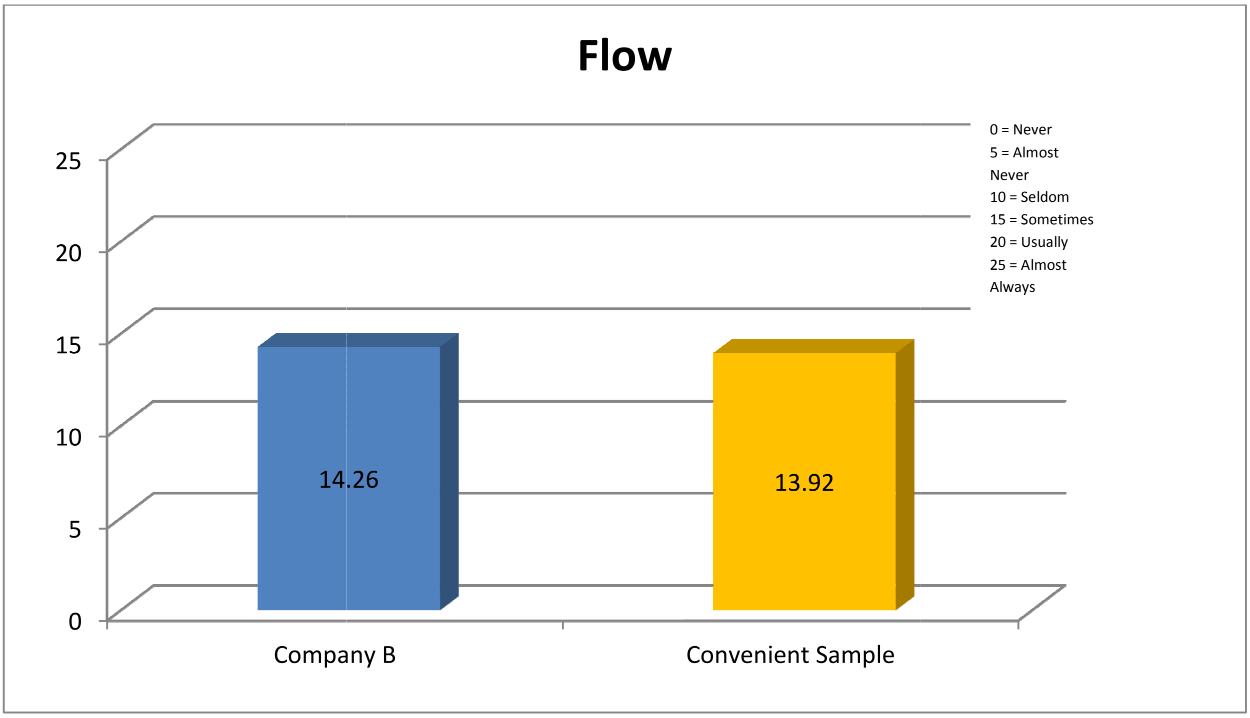
The figure below indicates average employee turnover intentions for both Company B and Convenient samples. A score above 3 indicates intention to leave, a score of 3 indicates 'neither agree nor disagree' and a score below 3 indicates disagreement with intention to leave.



The above figure shows that Company B employees, on average, rate similar on intent to leave compared to the convenient sample. For Company B employees, 59.6% of employees do not intend to leave ('disagree' or 'strongly disagree'), 9% are not sure ('neither agree nor disagree') and 31.4% may be intending to leave ('agree' or 'strongly agree').

3.5 Flow

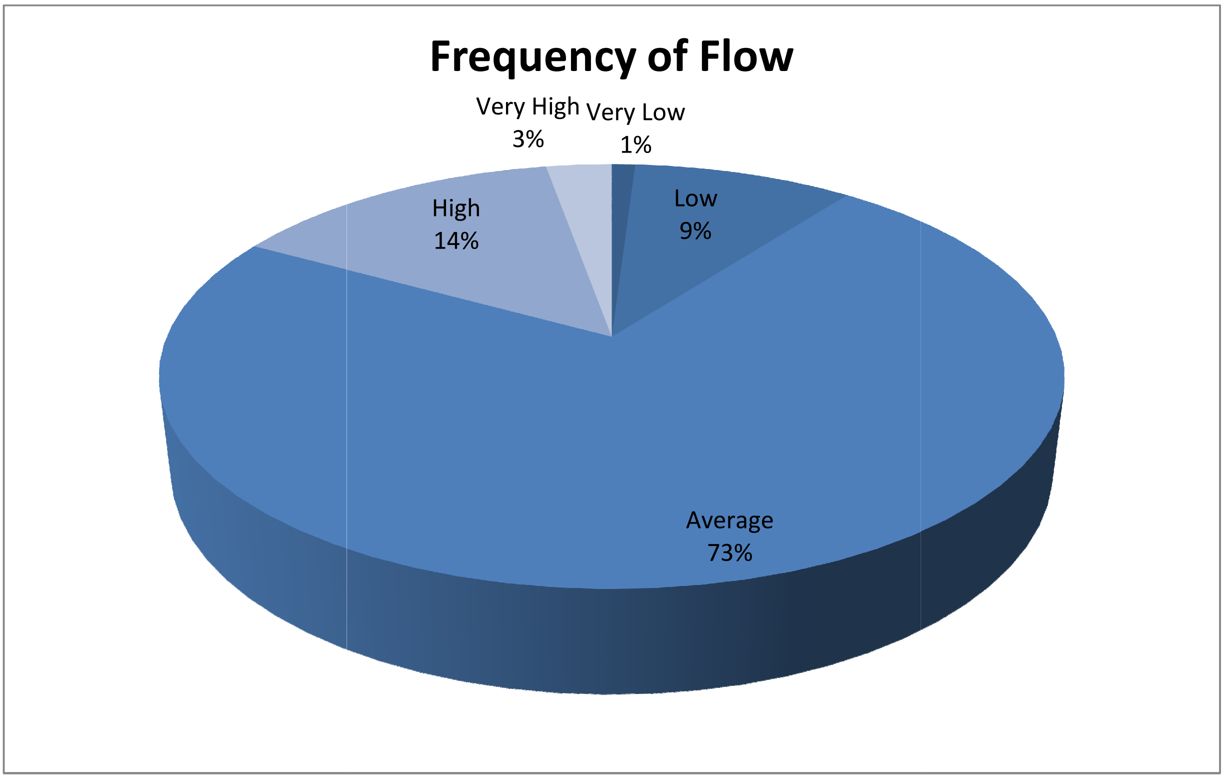
Flow can best be defined as a state of complete involvement with the activity at hand, where the activity presents constant challenges utilising a person's skills in full. In flow, the person feels in control, receives clear feedback regarding actions, actions seem to occur automatically without conscious thought, there is little distinction between self and environment, between activity and action, or between past present and future, and there is no experience of boredom or worry (Csikszentmihalyi, 1975). This experience represents 'pure enjoyment' in that the activity is undertaken because it is enjoyable in itself, the activity is carried out regardless of external reward i.e. financial reward, prestige or fame.



It can be seen from the above figure that Company B employees, on average, experience flow slightly more often than the convenient sample. A top score of 25 on the flow score, means that flow is experienced almost always, where as a zero score, indicates that flow is never experienced. Both Company B and the convenient sample have average scores that lie between 'Seldom' and 'Sometimes'.

The following figure shows the frequency of flow, in categories, amongst Company B employees. The following categories were calculated from percentile ranges using the convenient sample data:

Level of Flow	Lower limit percentile	Upper limit percentile
Very Low	0%	4.99%
Low	5%	24.99%
Average	25%	74.99%
High	75%	94.99%
Very High	95%	100.00%



As can be seen from the above figure, a very large proportion of Company B employees (90%) experience average to high levels of flow, whereas only 1% and 9% experience very low and low amounts of flow respectively.

3.6 Conditions to Flow

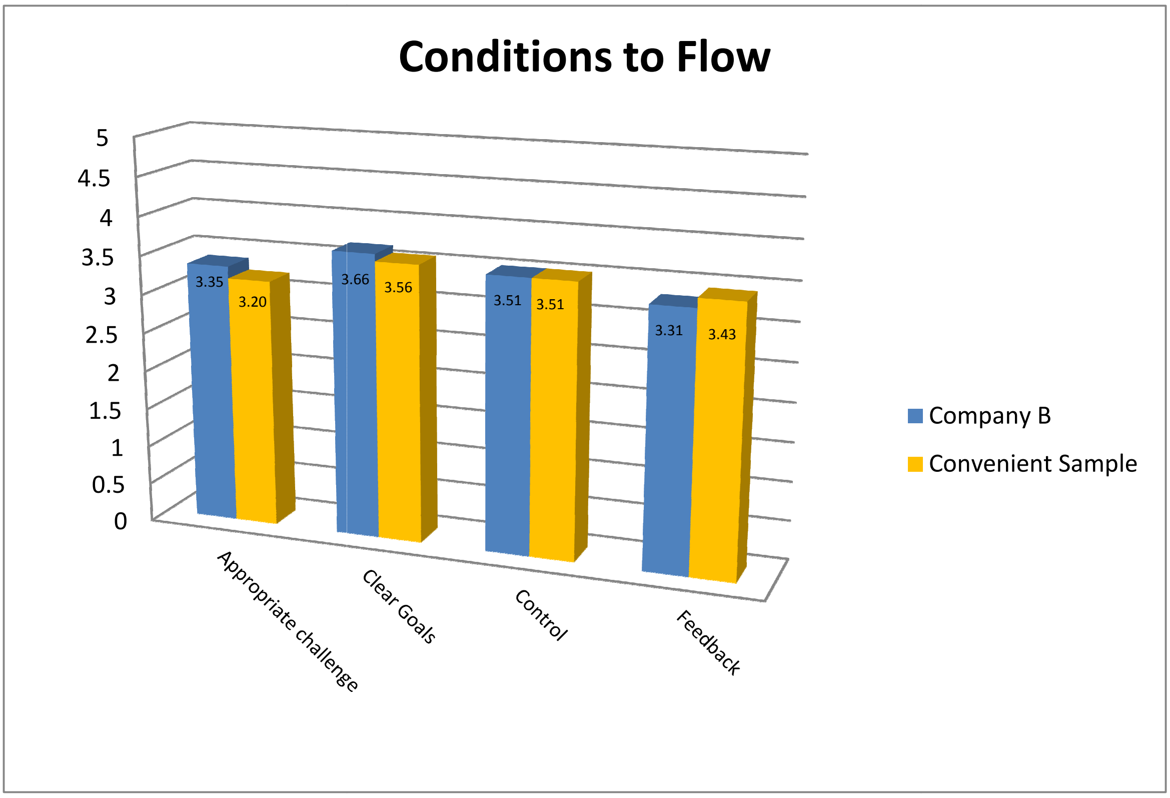
There are four conditions which are said to facilitate the flow experience. They include:

e) Appropriate balance between challenge and skill - stretching of skills at an appropriate level that does not over-challenge the individual.

f) Clear Goals- goals are clear and provide information as to how one is to carry out the task at hand.

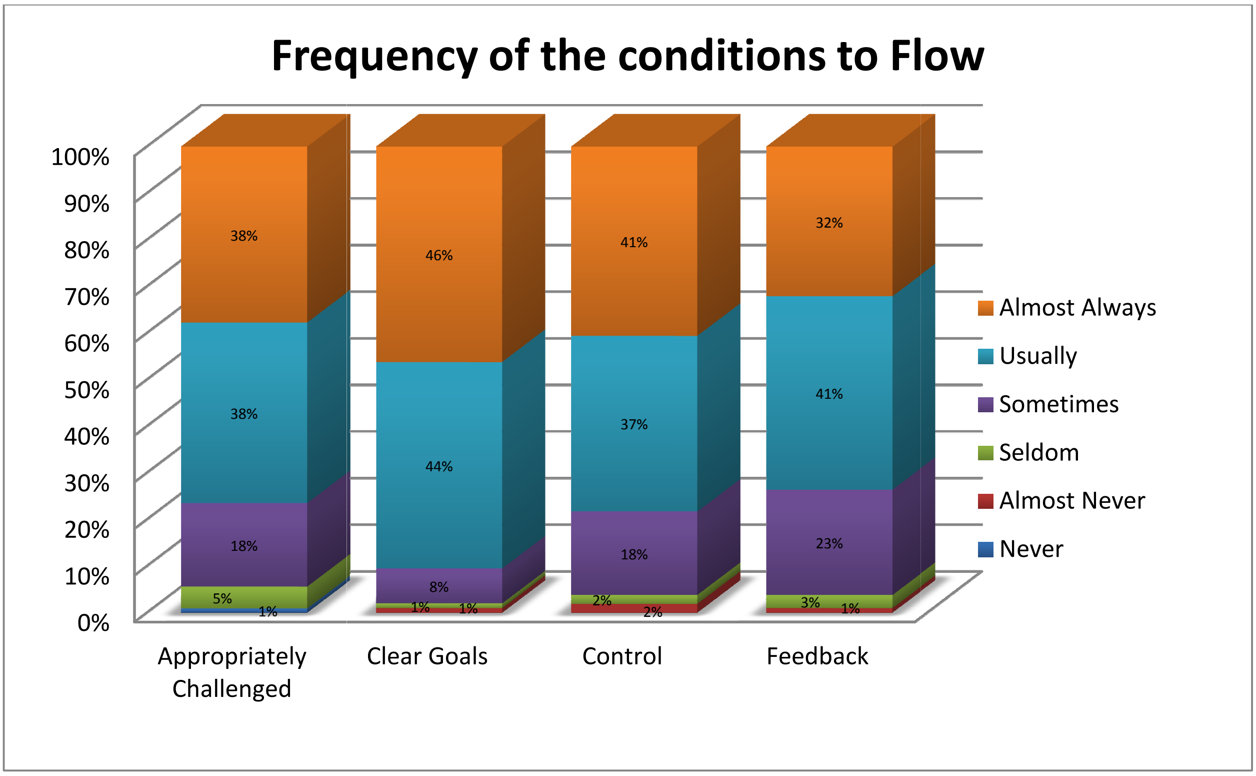
g) Feedback - unambiguous feedback that is used to determine how one is succeeding in their work.
h) Control - employees believe they have control of their work and are not worried about work becoming out of control.

The following figure shows employee averages for the four conditions to flow, for both Company B and convenient samples.



As can be seen from the above figure, the Company B sample does not vary much from the convenient sample. Company B employees do however, on average, experience slightly more appropriately challenging activities, slightly more clear goals, and less feedback than the convenient sample.

The following figure shows how often Company B employees experience the conditions to flow, represented as categories.



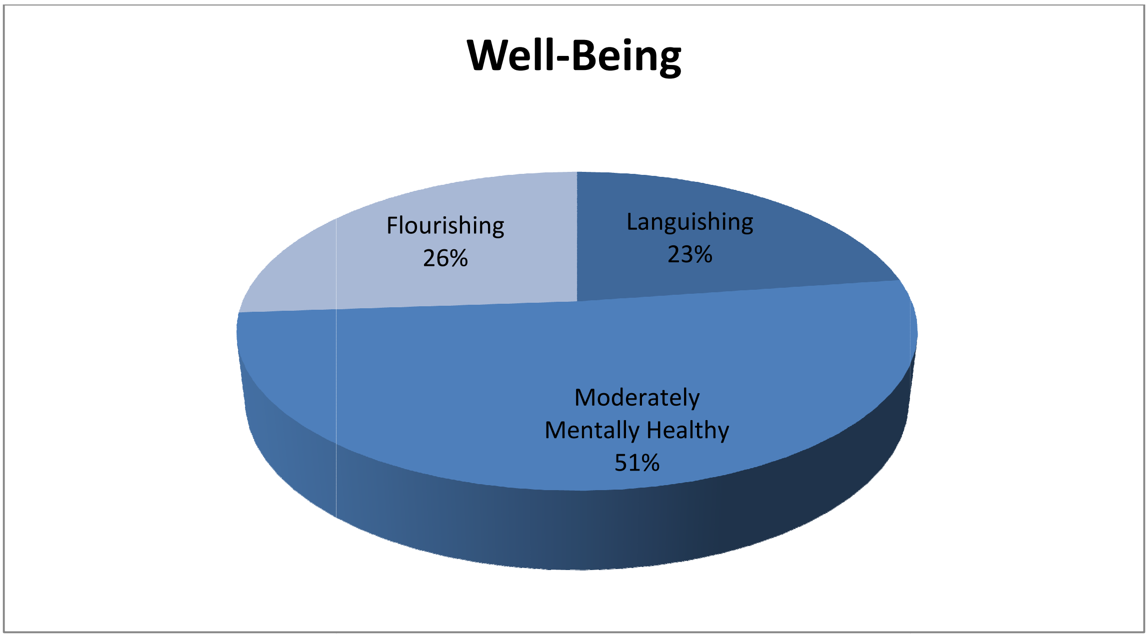
The above figure shows that out of the four conditions to flow, Company B employees experience the least amount of feedback, just over 73% reported that they received feedback 'usually' or more often at work. Being appropriately challenged and feeling in control are experienced slightly more frequently, with approximately 76% and 78% being appropriately challenged and feeling in control 'usually' or more often at work, respectively. A high percentage of Company B employees (90%) experience clear goals at work 'usually' or more often at work.

4. Mental Health

4.1 Well-Being

Well-Being (mental health) is defined here not as the absence of mental illness but rather a high level of performance of mental functioning, productive activity, fulfilling relationships with people, and the ability to change and cope with adversity (U.S. Department of Health and Human Services, 1999). Well-Being in this report has been classified into three categories: flourishing, moderately mentally healthy, and languishing. People who are flourishing are those who have positive feelings about life and are functioning well psychologically and socially (Keyes, 2002). People who are languishing tend to have negative feelings about life, are not functioning well psychologically and socially. Moderately mentally healthy, are those who are neither flourishing nor languishing in life (Keyes, 2002).

The following figure shows the percentage of Company B employees who are flourishing, moderately mentally healthy or languishing.

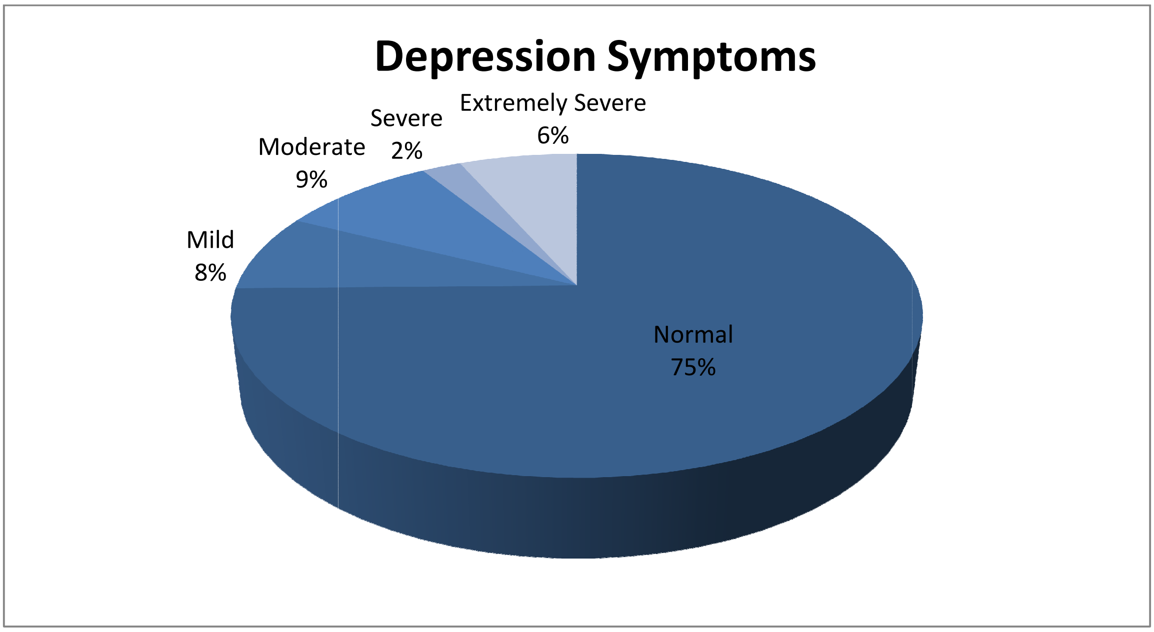


As can be seen from the above figure, a large proportion of employees have either average or high levels of well-being with only a small percentage of employees having low levels of well-being. A similar pattern was also found in the convenient sample, although for Company B employees slightly more employees are in the flourishing (+5%) and moderately mentally health categories (+1.6%) with slightly less being in the languishing category (-3.5%)

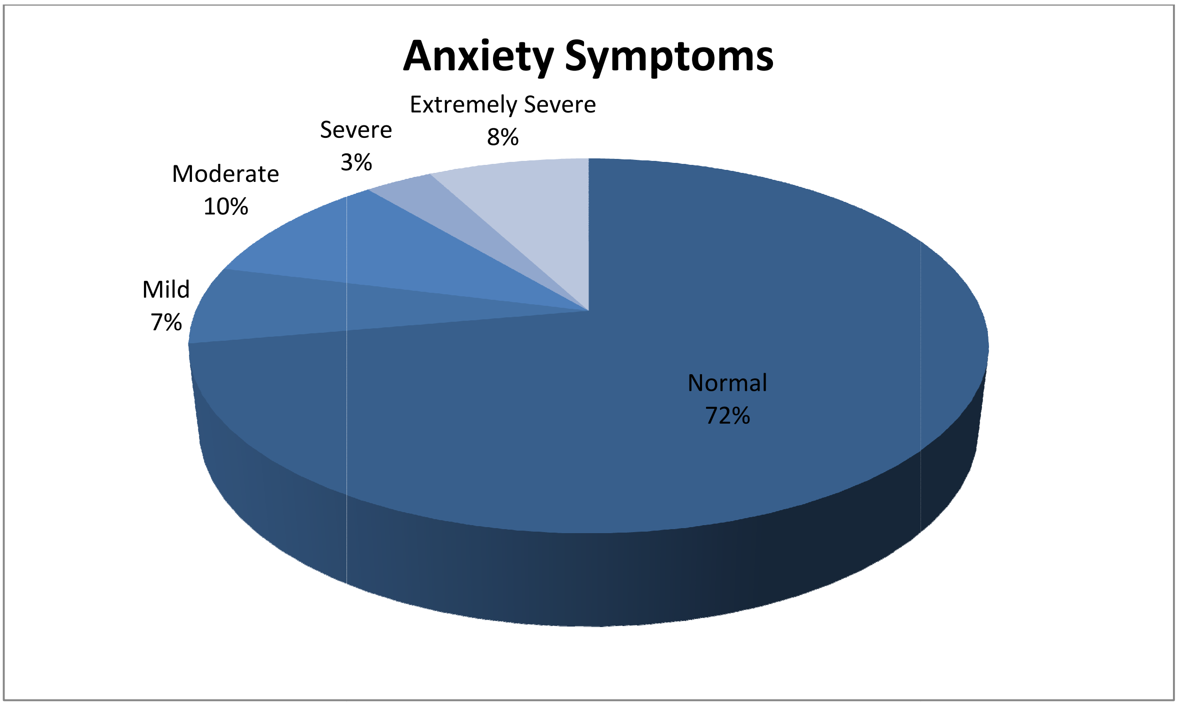
4.2 Mental Illness

The following three figures show symptoms for depression, anxiety and stress based on severity ranges used by the DASS (Depression, Anxiety and Stress Scales) respectively. Please note that the severity labels are used to describe the full range of scores within the population, thus for example someone who scored in the mild range will be above the population mean, however he/she is still likely to be well below meeting a diagnosis for clinical disorder (Lovibond & Lovibond, 1995).

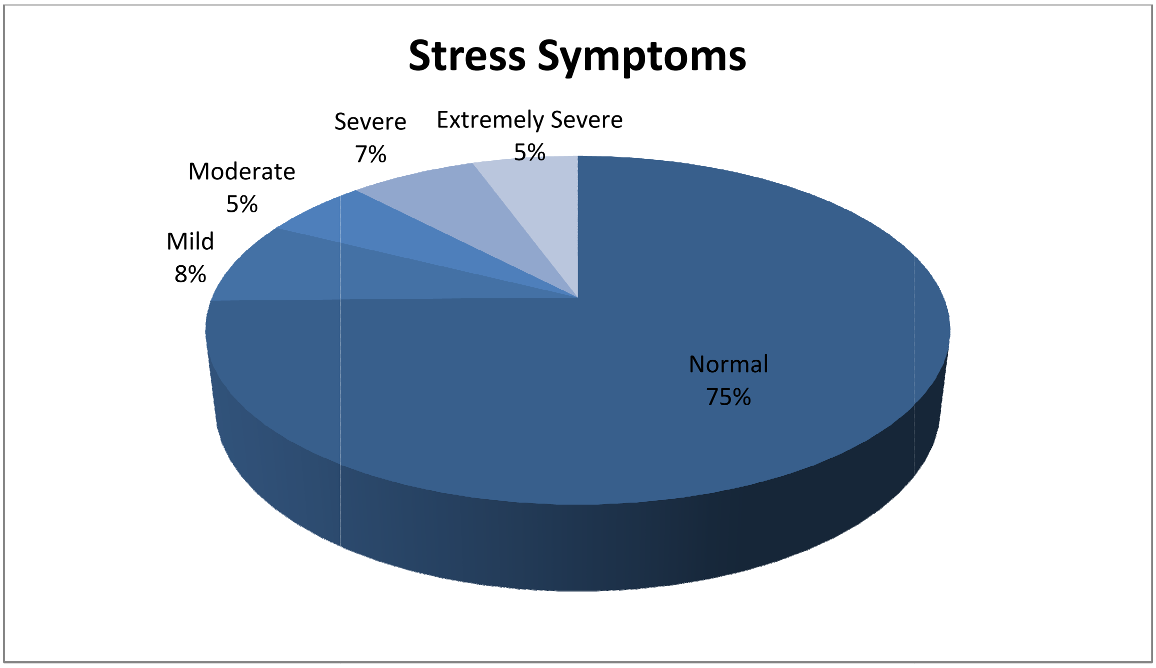
The Depression scale measures feelings of dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia (Lovibond & Lovibond, 1995).



The anxiety scale measures autonomic arousal, skeletal muscle effects, situational anxiety, and subject experience of anxious affect (Lovibond & Lovibond, 1995).



The stress scale measures difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient (Lovibond & Lovibond, 1995).



In terms of depression, anxiety and stress, the above three figures show that for most employees depression, anxiety and stress symptoms are in the mild to normal range. Similar results, in terms of percentages of severity ranges, were also found in the convenient sample for depression, anxiety and stress symptoms. However for anxiety and stress, Company B has approximately double the number of employees in 'extremely severe' range.

5. Conclusion

Overall the results for both work outcomes and employee mental health are good. For Company B employees, average engagement levels are within the normal range, job performance levels are high, overall absenteeism appears to be no different to the convenient sample. Average turnover intentions also do not differ much from the convenient sample, although results do show that around 40% are not sure about their intentions to stay/leave or may be intending to leave. With regards to flow experiences at work, a high proportion of employees (90% of Company B sample) experience average or higher amounts of flow at work.

With mental illness, although most (~75% of Company B sample) were found to be in the normal range, it was found that some employees reported severe and even extremely severe symptoms of depression, anxiety and stress. Additionally when compared to the convenient sample, for anxiety and stress symptoms, it was found that there were a higher proportion of Company B employees who were in the 'extremely severe' range.

5.1 Recommendations

Given that a large percentage of Company B employees sampled were not sure about their intentions to stay/leave or may be intending to leave, it is recommended that a future survey be administered to further openly explore possible reasons as to why Company B employees intend to leave. The present survey identified that the known conditions to flow and engagement, which could have explained why employees are intending to leave (i.e. a lack of being appropriately challenged), do not appear to be lacking amongst those sampled. There may however be many other factors responsible for employees intending to leave i.e. internal processes, role of supervisors and/or expected work demands, these were not looked at in this present survey.

On a more macro level, there may also be other factors that are contributing to employee's intention to leave and also mental illness symptoms, these may include the changing nature of the retail market i.e. increased online shopping, the opening of new super stores such as Costco and the recent global financial crisis. Reassuring staff during these times of change and increased competition may help address employee's concerns.

In relation to mental illness, if not already available, counselling via employee assistance programs should be made more available, and employees should be reminded periodically about the availability of such services. Additionally, appropriate resources could be made available to further enable/encourage employees to seek support. The *beyondblue* website http://www.beyondblue.org.au has a large amount of useful information on mental illness, treatment options and materials (i.e. information handouts and booklets) that can be ordered and distributed to employees.

In relation to well-being, levels can be improved by increasing the frequency with which employees experience flow, flow is very much an enjoyable experience seen as the secret to a happy life (R. G. Mitchell, Jr., 1988). Moreover, findings from my own PhD research show that those who experienced more flow at work were also found to be flourishing in life. Additionally, increasing flow can also lead to greater job performance, as being in flow is considered to be a state of optimal functioning where one is performing at their peak (Nakamura & Csikszentmihalyi, 2002).

There are two strategies for increasing flow experiences: restructuring tasks to make them more conducive to flow and also teaching employees how to experience flow.

The first strategy, restructuring tasks, may not always be possible or feasible, for instance it may not be possible to give employees more control in a certain role, but there may be other conditions that are easier to incorporate into tasks i.e. increasing feedback, or providing clear goals.

The second strategy, teaching employees how to experience flow, can be achieved by educating employees about flow; teaching employees the importance of setting clear and regular goals, how to identify and recognise feedback in their roles and the importance of being appropriately challenged to avoid boredom and anxiety. In addition, teaching employees how to better control their consciousness so that everyday worries and frustrations (that typically absorb a large amount of available psychic energy) can be forgotten, can help employees become more focused at work and likely result in more flow experiences at work. These strategies may best be taught by someone who has a good conceptual understanding of flow and the conditions necessary for it or someone who is experienced in delivering flow interventions.

Lastly, if not already in place, regular monitoring of mental health in the workplace and employee engagement/flow levels should occur. It is well known now, but often ignored, that employees are an organisation's greatest asset, and if they themselves are not functioning well (psychologically, socially and emotionally), it is difficult to imagine how they could be performing well at work.

5.2 Limitations of Survey

When interpreting these results, it is important to note that all data was derived from self-administered questionnaires and therefore may not be an accurate representation of concepts measured. For instance, social desirable responding may have influenced responses to some degree. The findings also may not be representative of all employees at Company B as only the National office containing approximately 645 employees were invited to participate, with 16% of those invited, volunteering to participate. Additionally findings may also not be representative due to sampling bias, for instance those who are intending to leave or those who are experiencing mental illness symptoms may have been more likely to participate.

Acknowledgements

I would sincerely like to thank the Injury Service Manager for all her assistance in enabling this important research to be conducted at Company B and all the Company B employees who took the time to participate. It is hoped that these findings and recommendations will be of benefit to Company B and their employees.

References:

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.

Keyes, C. L. M. (2002). The Mental Health Continuum: From Languishing to Flourishing in Life. *Journal of Health and Social Behavior, 43*(2), 207-222.

Lovibond, S. H., & Lovibond, P. F. (1995). Manual for the Depression Anxiety Stress Scales (2nd. Ed.). Sydney: Psychology Foundation.

Mitchell, R. G., Jr. (Ed.). (1988). *Sociological implications of the flow experience*. New York: Cambridge University Press.

Schaufeli, W. B., & Bakker, A. (2003). UWES: Utrecht Work Engagement Scale *Preliminary Manual* (pp. 58): Occupational Health Psychology Unit, Utrecht University.

U.S. Department of Health and Human Services. (1999). Mental Health: A report of the Surgeon General. Rockville, MD.

Appendix A-25: Participant Information Sheet – Studies 4, 5, and 6

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

Australian Catholic University Limited
ABN 15 050 192 660
Melbourne Campus (St Patrick's)
115 Victoria Parade Fitzroy VIC 3065
Locked Bag 4115 Fitzroy MDC VIC 3065
Telephone 613 9953 3000
Facsimile 613 9953 3005

INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT: Optimal Experience in the Workplace: Outcomes to experiencing flow

PRINCIPAL SUPERVISOR: BARRY J FALLON

STUDENT RESEARCHER: CHRIS HOLT

PROGRAMME IN WHICH ENROLLED: PhD

Dear Participant,

You are invited to take part in a student research study which aims to look at what positive work experiences (if any) are related to well being and workplace productivity.

There are no known risks, inconveniences and/or discomforts associated with completing this questionnaire. Should you however feel that this questionnaire is distressing in anyway please feel free to refer to the contact listed below for appropriate support/counselling.

To be involved in this study we invite you to complete an online questionnaire which can be accessed at: www.psychdata.com. This questionnaire should take no more than 45 mins to complete.

As participants you may find this activity informative, insightful, and enjoyable. On a more general level this study may also help identify what positive workplace experiences are related to employee well being and productivity. Overall findings obtained from this study may be published in an appropriate psychological journal.

As a possible participant you are free to withdraw if you do not elect to submit your partially completed or completed questionnaire (once your response is submitted you are unable to withdraw your responses). By submission of the electronic questionnaire you are giving informed consent to participate in this research.

No identifying information is asked during the conduct of this study and as result confidentiality will be maintained at all times during the study and in any report or publication that arises from it. No attempt will be made to trace you as the participant completing this questionnaire. However, if you wish to enter into a draw to win 2 movie tickets for your participation in this research, if you win, you will be contacted to receive your movie tickets. To go into the draw to win, once completed the questionnaire you will be redirected to a page with a code which you will have to send to the researchers via email (cjholt001@myacu.edu.au). There will be a 1 in 50 chance of winning 2 movie tickets. You will not receive any further emails or be contacted again, and there will be no way of linking your submitted questionnaire to your email address if you chose to enter.

Any questions regarding this project should be directed to the Principal Supervisor or to the Student Researcher:

Mr Christopher J Holt
PHD Student

Professor Barry J Fallon
Principal Supervisor

Phone number: 9953 3108

Address: School of Psychology,
Australian Catholic University
115 Victoria Pde, Fitzroy Vic. 3065

For support/counselling should you find that this questionnaire is distressing in anyway please feel free to contact:

Dr Barbara Jones
PH: 9953 3464
Senior Lecturer
National School of Psychology

If you would like to obtain a report of the findings from this study please forward your email details to cjholt001@myacu.edu.au.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Investigator or Supervisor and Student Researcher has (have) not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee.

VIC: Chair, HREC
C/- Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.

Professor Barry Fallon	Christopher Holt
…………………………………….	……………………………………
Principal Supervisor	Student Researcher

Appendix A-26: Utrecht Work Engagement Scale (UWES-9)

Preamble: The following 9 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, select "0" (zero) in the space after the statement. If you have had this feeling, indicate how often you felt it by selecting the number (from 1 to 6) that best describes how frequently you feel that way, see scoring key below.

Scoring key: 0 = Never, 1 = Almost never/A few times a year or less, 2= Rarely/Once a month or less, 3 = Sometimes/A few times a month, 4 = Often/Once a week, 5 = Very often/A few times a week, 6 = Always/Everyday.

Item No.	Subscale	Item
1	VI	At my work, I feel bursting with energy.
2	VI	At my job, I feel strong, and vigorous.
3	DE	I am enthusiastic about my job.
4	DE	My job inspires me.
5	VI	When I get up in the morning, I feel like going to work.
6	AB	I feel happy when I am working intensely.
7	DE	I am proud of the work that I do.
8	AB	I am immersed in my work.
9	AB	I get carried away when I am working.

Note. VI = Vigour; DE = Dedication; AB = Absorption.

Appendix A-27: Depression Anxiety Stress Scales 21 (DASS 21)

Preamble: Please read each statement and select a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

Scoring key: 0 = Did not apply to me at all; 1= Applied to me to some degree, or some of the time; 2 = Applied to me to a considerable degree, or a good part of time; 3 = Applied to me very much, or most of the time.

Item No.	Scales	Item
1	STR	I found it hard to wind down.
2	ANX	I was aware of dryness of my mouth.
3	DEP	I couldn't seem to experience any positive feeling at all.
4	ANX	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion).
5	DEP	I found it difficult to work up the initiative to do things.
6	STR	I tended to over-react to situations.
7	ANX	I experienced trembling (eg, in the hands).
8	STR	I felt that I was using a lot of nervous energy.
9	ANX	I was worried about situations in which I might panic and make a fool of myself.
10	DEP	I felt that I had nothing to look forward to.
11	STR	I found myself getting agitated.
12	STR	I found it difficult to relax.
13	DEP	I felt down-hearted and blue.
14	STR	I was intolerant of anything that kept me from getting on with what I was doing.
15	ANX	I felt I was close to panic.
16	DEP	I was unable to become enthusiastic about anything.

Item No.	Scales	Item
17	DEP	I felt I wasn't worth much as a person.
18	STR	I felt that I was rather touchy.
19	ANX	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat).
20	ANX	I felt scared without any good reason.
21	DEP	I felt that life was meaningless.

Note. STR = Stress; ANX = Anxiety; DEP = Depression.

Appendix A-28: Emotional Well-Being Scale

Preamble: Please rate how much of the time during the past 30 days have you felt (none, a little, some, most or all of the time):

Scoring key: 0 = None of the time, 1 = A little of the time, 2= Some of the time, 3 = Most of the time, 4 = All of the time.

Item No.	Item
1	Cheerful.
2	In good spirits.
3	Extremely happy.
4	Calm & peaceful.
5	Satisfied.
6	Full of life.

Over the last 30 days how would you rate your life overall (on a scale of 0 to 10, where 0 means the worst possible life overall and 10 means the best possible life overall).

Appendix A-29: Scales of Psychological Well-Being

Preamble: Please respond to the following statements about how you have been feeling during the past month.

Scoring key: 1= Strongly disagree, 2 = Moderately disagree, 3 = Slightly disagree, 4 = Slightly agree, 5 = Moderately agree, 6 = Strongly agree.

Item No.	Scales	Item
1	SA	When I look at the story of my life, I am pleased with how things have turned out.
2	PRO	I often feel lonely because I have few close friends with whom to share my concerns. (N)
3	A	I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.
4	EM	In general, I feel I am in charge of the situation in which I live.
5	PL	I feel good when I think of what I've done in the past and what I hope to do in the future.
6	PGTH	In general, I feel that I continue to learn more about myself as time goes by.
7	SA	In general, I feel confident and positive about myself.
8	PRO	I don't have many people who want to listen when I need to talk. (N)
9	A	I tend to worry about what other people think of me. (N)
10	EM	The demands of everyday life often get me down. (N)
11	PL	I have a sense of direction and purpose in life.
12	PGTH	I don't want to try new ways of doing things – my life is fine the way it is. (N)
13	SA	Given the opportunity, there are many things about myself that I would change. (N)
14	PRO	I feel like I get a lot out of my friendships.
15	A	I tend to be influenced by people with strong opinions. (N)
16	EM	I am quite good at managing the many responsibilities of my daily life.
17	PL	I don't have a good sense of what it is I'm trying to accomplish in life. (N)

Item No.	Scales	Item
18	PGTH	I think it is important to have new experiences that challenge how you think about yourself and the world.
19	SA	I like most aspects of my personality.
20	PRO	It seems to me that most other people have more friends than I do. (N)
21	A	I have confidence in my opinions, even if they are contrary to the general consensus.
22	EM	If I were unhappy with my living situation, I would take effective steps to change it.
23	PL	I enjoy making plans for the future and working to make them a reality.
24	PGTH	When I think about it, I haven't really improved much as a person over the years. (N)
25	SA	In many ways, I feel disappointed about my achievements in life. (N)
26	PRO	I have not experienced many warm and trusting relationships with others. (N)
27	A	It's difficult for me to voice my own opinions on controversial matters. (N)
28	EM	I have difficulty arranging my life in a way that is satisfying to me. (N)
29	PL	I am an active person in carrying out the plans I set for myself.
30	PGTH	I have the sense that I have developed a lot as a person over time.
31	SA	For the most part, I am proud of who I am and the life I lead.
32	PRO	I know that I can trust my friends, and they know they can trust me.
33	A	I often change my mind about decisions if my friends or family disagree. (N)
34	EM	I have been able to build a home and a lifestyle for myself that is much to my liking.
35	PL	My aims in life have been more a source of satisfaction than frustration to me.
36	PGTH	For me, life has been a continuous process of learning, changing and growth.
37	A	I am concerned about how other people evaluate the choices I have made in my life. (N)

Item No.	Scales	Item
38	PGTH	I gave up trying to make big improvements or changes in my life a long time ago. (N)
39	A	I judge myself by what I think is important, not by the values of what others think is important.

Note. PGTH = Personal Growth; SA = Self-Acceptance; PRO = Positive Relations With Others; A = Autonomy; EM = Environmental Mastery; PL = Purpose in Life; (N) = Negatively keyed item.

Appendix A-30: Social Well-Being Scales

Preamble: Please respond to the following statements about how you have been feeling during the past month

Scoring key: 1= Strongly disagree, 2= Moderately disagree, 3 = Slightly disagree, 4 = Don't know, 5 = Slightly agree, 6 = Moderately agree, 7 = Strongly agree.

Item No.	Scales	Item
1	SCe	The world is too complex for me. (N)
2	SI	I don't feel I belong to anything I'd call a community. (N)
3	SAe	People who do a favour expect nothing in return.
4	SC	I have something valuable to give to the world.
5	SA	The world is becoming a better place for everyone.
6	SI	I feel close to other people in my community.
7	SC	My daily activities do not produce anything worthwhile for my community. (N)
8	SCe	I cannot make sense of what's going on in the world. (N)
9	SA	Society has stopped making progress. (N)
10	SAe	People do not care about other people's problems. (N)
11	SI	My community is a source of comfort.
12	SCe	I find it easy to predict what will happen next in society.
13	SA	Society isn't improving for people like me. (N)
14	SAe	I believe that people are kind.
15	SC	I have nothing important to contribute to society. (N)

Note. SCe = Social Coherence; SI = Social Integration; SAe = Social Acceptance; SC = Social Contribution; SA = Social Actualisation; (N) = Negatively keyed item.

Appendix A-31: Absenteeism and Presenteeism questions from the World Health Organisation's Health and Work Performance Questionnaire (WHO HPQ)

Item No.	Item
1	How many hours does your employer expect you to work in a typical 7-day week? (If it varies, estimate the average. If more than 97, enter 97.)
2	About how many hours altogether did you work in the past 4 weeks (28 days? See examples below.)

Examples for Calculating Hours Worked in the Past 4 Weeks

- 40 hours per week for 4 weeks = 160 hours
- 35 hours per week for 4 weeks = 140 hours
- 40 hours per week for 4 weeks with two 8-hour days missed = 144 hours
- 40 hours per week for 4 weeks with three 4-hour partial days missed = 148 hours
- 35 hours per week for 4 weeks with two 8-hour days missed and three 4-hour partial days missed = 112 hours

Item No.	Scale	Item
1	JP	On a scale from 0-10 where 0 is the worst job performance anyone could have at your job and 10 is the performance of a top worker, how would you rate the usual performance of **most** workers in a job similar to yours?
2	JP	Using the same 0-10 scale, how would you rate your **usual** job performance over the past year or two?
3	JP	Using the same 0-10 scale, how would you rate your overall job performance on the days you worked during the **past 4 weeks** (28 days)?
4	JP	Using the same 0-10 scale, how would your peers rate your job performance during the **past 4 weeks** (28 days)?
5	JP	Using the same 0 to 10 scale, how would your supervisor rate your job performance during the **past 4 weeks** (28 days)?

Note. JP = Job Performance.

Appendix A-32: Turnover Intentions Scale

Preamble: Using the scoring key below, indicate your response to each statement.

Scoring key: 1 = Strongly disagree, 2= Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree.

Item No.	Scale	Item
1	TO	I will probably look for a new job in the near future.
2	TO	At the present time, I am actively searching for another job in a different organisation.
3	TO	I do not intend to quit my job. (N)
4	TO	It is unlikely that I will actively look for a different organisation to work for in the next year. (N)
5	TO	I am not thinking about quitting my job at the present time. (N)

Note. TO = Turnover Intentions; (N) = Negatively keyed item