The competing demands of adolescent TBI rehabilitation:
An investigation of adolescents’ perceived confidence and competence in executive functioning skills following childhood traumatic brain injury

Lucie Shanahan
(BSpPath; PGDipRuralHealth)

An exegesis presented in fulfilment of the requirements for the degree of Doctor of Health Science at Charles Sturt University.

September 2013
# TABLE OF CONTENTS

TABLE OF CONTENTS ........................................................................................................... II
LIST OF TABLES ................................................................................................................... VII
LIST OF FIGURES .................................................................................................................. VIII
CERTIFICATE OF AUTHORSHIP .............................................................................................. IX
DEDICATION .......................................................................................................................... X
ACKNOWLEDGEMENTS ......................................................................................................... XI
FINANCIAL SUPPORT ............................................................................................................. XII
PROFESSIONAL EDITORIAL ASSISTANCE .......................................................................... XII
ETHICS APPROVAL ................................................................................................................ XIII
PUBLICATIONS AND PRESENTATIONS ARISING FROM THIS EXEGESIS ....................... XIV
ABSTRACT ............................................................................................................................ XVI

SECTION ONE: SETTING THE SCENE .................................................................................. XIX

CHAPTER 1 OVERVIEW OF THE EXEGESIS ...................................................................... 1

1.1 MOTIVATION FOR COMPLETING THIS STUDY ............................................................. 1
1.2 THE EVOLUTION OF THIS STUDY .................................................................................. 4
1.3 PURPOSE AND SCOPE OF STUDY .............................................................................. 6
1.4 AN OVERVIEW OF THE EXEGESIS .............................................................................. 7

CHAPTER 2 THE MATURING OF PAEDIATRIC TBI REHABILITATION .............................. 10

Introduction ............................................................................................................................ 10
2.1 TRAUMATIC BRAIN INJURY: DEFINITION, INCIDENCE AND SEQUELAE .............. 12
2.1.1 Mechanism of injury ................................................................................................. 13
2.1.2 Epidemiology ............................................................................................................. 15
2.1.3 Sequelae .................................................................................................................... 18
2.1.3.1 Cumulative effects ............................................................................................. 18
2.1.3.2 Cognitive impairments ...................................................................................... 21
2.1.3.3 Executive function (EF) impairment ................................................................. 23
2.2 COGNITIVE REHABILITATION .................................................................................... 26
2.2.1 The development of cognitive rehabilitation .......................................................... 27
2.2.2 The “traditional approach” to cognitive rehabilitation ......................................... 28
2.2.2.1 Direct approach ............................................................................................... 28
2.2.2.2 Compensatory approach ............................................................................... 29
2.2.2.3 Environmental modification .......................................................................... 30
2.2.3 Rehabilitation in the Vygotskyan spirit ................................................................. 31
3.6.3 An introduction to Interpretative Phenomenological Analysis 106
3.6.4 The use of IPA principles in data analysis 107
  3.6.4.1 The process used for this study 108
3.7 CONCLUSION 115

CHAPTER 4 KEY THEMES FROM PARTICIPANT INTERVIEWS 117

Introduction 117

4.1 HARRY AND JACK: LANGUAGE IMPAIRMENT AND ITS IMPACT ON INTERVIEW PARTICIPATION 118

4.2 KEY THEME 1: DEVELOPMENT OF SELF 122
  4.2.1 Identity development: “they see me” 122
  4.2.2 Individuation and Family Differentiation: “it’s gotta be me doing all this stuff” 127
  4.2.3 Discussion: Theme 1: Development of Self 132

4.3 KEY THEME 2: BOND 136
  4.3.1 Mentors/Role Models: “I look up at me boss” 138
  4.3.2 Sense of Team: “I just like being a part of it” 142
  4.3.3 Co-constructed Learning: “he always comes and grabs me and shows me stuff” 146
  4.3.4 Discussion: Theme 2: Bond 150

4.4 KEY THEME 3: TASK RELEVANCE 153
  4.4.1 Real-life Application: “what I do in the army I’m gonna be using in like five minutes time” 153
  4.4.2 Task Rewards: 156
  4.4.3 Contributing to meaningful activities “I’ve started playing a part now” 159
  4.4.4 Discussion: Theme 3: Task Relevance 161

4.5 KEY THEME 4: MOTIVATION 164
  4.5.1 Motivation: an introduction 165
  4.5.2 Verbalising motivation: “I want” 167
  4.5.3 Creating a better life for oneself: “there’s just more to life than just working at the abattoirs” 169
  4.5.4 A secure relational basis: “I know if I get in trouble with doing this task there’s always someone there that’s gonna help me in all this.” 171
  4.5.5 The need for autonomy: “I’ve got my own little method that I made up” 174
  4.5.6 Self-efficacy: “Now I reckon I feel confident to do it by myself” 175

4.6 KEY THEME 5: ENGAGEMENT; A MULTI-COMPONENT CONSTRUCT 178
  4.6.1 Behavioural engagement: “I just keep going and going” 179
  4.6.2 Emotional engagement: “even if I’ve had a shit day I’m just still happy” 181
4.6.3 Cognitive engagement: “I just watch and I just concentrate” .................. 183
4.6.4 Discussion: Themes 4 and 5: Motivation and Engagement ...................... 187

4.7 KEY THEME 6: CONFIDENCE AND COMPETENCE .................................. 189
  4.7.1 Confidence over competence: the adolescents’ perception: “I feel pretty confident in the army actually” .................................................. 190
  4.7.2 Competence over confidence: the parents’ perception: “I just worry” .... 197
  4.7.3 Discussion: Theme 6: Confidence and Competence ......................... 199

4.8 CONCLUSION .................................................................................. 204

SECTION THREE: IMPLICATIONS FOR PRACTICE ........................................... 206

CHAPTER 5 SYNTHESIS OF FINDINGS ....................................................... 207
  Introduction .................................................................................... 207
  5.1 THE RIPE FOR REHAB FRAMEWORK ............................................. 209
   5.1.1 Reading the Ripe for Rehab Framework .................................... 211
  5.2 PERCEIVING CONFIDENCE AND COMPETENCE IN EXECUTIVE FUNCTIONING SKILLS ............................................................. 215
  5.3 LINKING ENVIRONMENT AND OUTCOME THROUGH SELF-ESTEEM ..... 217
  5.4 BUILDING SELF-ESTEEM – THE ROLE OF MOTIVATION AND ENGAGEMENT 219
   5.4.1 The role of motivation ............................................................... 220
   5.4.2 The role of engagement ......................................................... 223
  5.5 THE INTERPERSONAL CONTEXT .................................................... 226
   5.5.1 Bond .................................................................................. 227
      5.5.1.1 Role models/mentors .......................................................... 229
      5.5.1.2 Sense of Team ................................................................. 232
   5.5.2 Co-constructed learning ......................................................... 237
  5.6 THE ACTIVITY CONTEXT ............................................................... 240
   5.6.1 Task Relevance ................................................................... 241
   5.6.2 Contextualised instruction ..................................................... 244
      5.6.2.1 The importance of activities of optimal challenge .............. 245
      5.6.2.2 Apprenticeship approach ............................................... 247
  5.7 DEVELOPMENTAL CONTEXT .......................................................... 251
   5.7.1 A developmental trajectory .................................................... 252
      5.7.1.1 Executive function development and negotiating adolescence .... 253
   5.7.2 Identity development ............................................................. 257
   5.7.3 Process of Individuation ........................................................ 262
   5.7.4 Opportunities for self-determination ....................................... 264
  5.8 SUMMARY .................................................................................. 267
5.9 CLINICAL APPLICATION OF THE R4RF .......................................................... 274
5.10 CONCLUSION ......................................................................................... 276

CHAPTER 6 CONCLUSION ............................................................................. 277
Introduction ...................................................................................................... 277
6.1 LIMITATIONS OF THIS STUDY ............................................................. 277
6.2 UNIQUE CONTRIBUTIONS OF THIS RESEARCH .............................. 280
6.3 DIRECTIONS FOR FUTURE RESEARCH ......................................... 281
6.4 CONCLUDING REMARKS .................................................................. 283
# LIST OF TABLES

Table 2.1: Marcia's identity statuses ................................................................. 50

Table 3.1: Characteristics of participants .......................................................... 84

Table 3.2: Ethical considerations addressed in recruitment phase ..................... 85

Table 3.3: Data sources and types ....................................................................... 90

Table 3.4: Ethical considerations addressed in data collection phase ................. 101

Table 3.5: Definitions of criteria used to score the PPT ..................................... 105

Table 3.6: Steps to analysis in IPA ....................................................................... 109

Table 4.1: Summary of standardised scores for language and intellectual functioning assessments for Harry and Jack ................................................................. 119

Table 4.2: Overview of themes identified from interviews ................................. 121

Table 4.3: Types of reward used to determine task relevance ......................... 157

Table 4.5: PPT reported levels of competence .................................................. 191

Table 4.6: Factors shown to enhance confidence in executive functioning ......... 194

Table 4.7: Factors needed to move from confidence to competence ............... 195

Table 4.8: An illustration of Jack’s mum increasing sense of her son’s competence ......................................................................................................................... 199

Table 5.1: Widely reported correlates and predictors of resilience in youth and their association with impairments post childhood TBI. .............................. 256

Table 5.2: Summary of the clinical application of the R4RF ............................ 274
LIST OF FIGURES

Figure 2.1: Features of an Apprenticeship Model .................................................. 37
Figure 2.2: The Social Development Model ............................................................. 58
Figure 2.3: Self-systems process model depicting the relationship between context, psychological needs, engagement and outcome. ............................ 66
Figure 3.1: Summary of the utility of mixed methods research .............................. 79
Figure 3.2: Visual map of a triangulation mixed methods design ......................... 87
Figure 3.3: Hand drawn schematic depicting qualitative data analysis .............. 110
Figure 5.1: The Ripe for Rehab Framework ......................................................... 214
Figure 5.2: The developmental impact of autonomy on engagement ............... 267
CERTIFICATE OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Charles Sturt University or any other educational institution, except where due acknowledgement is made in the exegesis. Any contribution made to the research by colleagues with whom I have worked at Charles Sturt University or elsewhere during my candidature is fully acknowledged.

I agree that this exegesis be accessible for the purpose of study and research in accordance with the normal conditions established by the Executive Director, Library Services or nominee, for the care, loan or reproduction of theses.

Signature: ___________________________ Date: ___________________________
DEDICATION

This exegesis is dedicated to my parents - two strong, intelligent people who have taught me the value of knowledge, compassion and community.
ACKNOWLEDGEMENTS

I would like to acknowledge my supervisors, Associate Professor Michael Curtin, Discipline Leader, Occupational Therapy with the School of Community Health, Charles Sturt University, and Professor Lindy McAllister, Professor of Work Integrated Learning and Associate Dean, Work Integrated Learning with the University of Sydney. Michael and Lindy have offered me guidance, advice, support and many hours of their time and enthusiasm during the course of this project. Their patience is to be commended. I would particularly like to thank Lindy for initially convincing me that achieving this was within the realm of my possibilities. I would like to thank Harry, Jack and their mums for agreeing to participate in this study and willingly sharing their experiences. I am forever grateful to you for trusting me with your stories.

I would like to acknowledge the support of the South West Brain Injury Rehabilitation Service in recruiting participants for this study and the service’s support to attend conferences and workshops to disseminate findings from this study. I would like to acknowledge the support of various colleagues from The Kids’ Team – Wendy Moore, Matt Conroy, Lara Trevethan and Clare Dickson; in particular, I would like to acknowledge Cathy Bucolo and Jane Murtagh whose endless encouragement, interest and support made this journey more worthwhile and who are responsible for my passion for supporting children and adolescents with TBI.

I would particularly like to thank Jenny and Paul Drummond, Leah and Adam Wiseman, Anna and Andy Kaye, Tanya Dawe, and Alex Little for their unwavering support and friendship. To my family, who have tolerated my repeated absences from family gatherings for the past decade but who have also offered me emotional support, encouragement and understanding, I extend my greatest thanks. Lastly, I would like to acknowledge and thank Mark who has not known me without postgraduate study. He has of all, been my greatest support, critic and motivator. His belief in me to complete this work has often been the thing that has kept me going.
FINANCIAL SUPPORT

I would like to acknowledge the Australian Rural and Remote Health Professional Scholarship Scheme through which I obtained a post graduate scholarship to assist with my study - $11,600.00 (2006).

PROFESSIONAL EDITORIAL ASSISTANCE

I would also like to acknowledge and thank Joan Rosenthal for proof reading this exegesis and providing advice on matters of grammar, formatting and style.
ETHICS APPROVAL

This study was conducted with the approval of the following Ethics in Human Research Committees:

Charles Sturt University, protocol number 2006/109

Greater Southern Area Health Service, protocol number 2006/11
PUBLICATIONS AND PRESENTATIONS ARISING FROM THIS EXEGESIS

Journal articles


Conference presentations


Workshops and seminars


ABSTRACT

Traumatic brain injury (TBI) is the leading cause of long-term disability in children and young adults. An injury acquired in childhood results in functional impairments across a range of domains, with some impairments not becoming apparent and others worsening as a child progresses through childhood to adolescence. The chronic nature of impairments associated with paediatric TBI and the realisation that pre- and post-injury child development influences recovery and progression post-injury, has necessitated the development of rehabilitation models of care that are specific to the paediatric population. Disruption to executive function development in particular, can result in unrealised academic, vocational and psychosocial potential and children, adolescents, their families, educators and employers require ongoing, well-timed and well-informed rehabilitation support to maximise community integration. Paediatric TBI rehabilitation is now recognised as a specialist field within its own right, but research that documents consumers’ experiences of rehabilitation or research that informs the ongoing development of rehabilitation models designed to meet the specific and particular needs of adolescents remains limited.

The aim of the research reported in this exegesis and accompanying portfolio, was to ascertain how adolescents who had sustained a TBI during childhood, and who had subsequently been engaged with a specialist paediatric TBI rehabilitation programme on a long-term basis, perceived
their executive functioning (EF) skills. The perceptions of a parent of each adolescent were also sought.

This research was undertaken in three phases using a pragmatic research approach. A mixed methods design saw the collection of a broad range of data from participants. The first phase of the study collected standardised assessment data with each adolescent participant, and the second phase focussed on ecological assessment and the commencement of qualitative data collection via participant self-reflection. The third stage of data collection used unstructured, in-depth interviews with each adolescent and their mother.

The results indicated that both adolescents, despite long term engagement with a specialised paediatric TBI rehabilitation programme, continued to experience pervasive EF impairments. The levels of confidence and competence perceived by adolescents and their parents with regard to EF skills varied. Qualitative data recorded for this study indicated that adolescents’ perceptions of their EF skills were responsive to the contextual supports available to them. Data also revealed that adolescents and parents viewed confidence and competence in EF skills differently, with adolescents focussed on developing confidence in their skills and parents more focussed on observing competent skill use.

The findings highlight the need for adolescent TBI rehabilitation models to be considerate of normal developmental tasks of adolescence such as identity and role development. Through synthesising the findings of this study with a number of existing rehabilitation frameworks and models
of adolescent development, the Ripe for Rehab framework, a framework for engaging adolescents in cognitive rehabilitation, is proposed. This research contributes to the ongoing development of TBI rehabilitation frameworks and models of care that specifically address the needs of adolescents and their families, and support their ongoing development and community integration post-injury.
SECTION ONE:
SETTING THE SCENE
Chapter 1
Overview of the exegesis

This exegesis presents the findings of research that explored how two adolescent males with traumatic brain injury perceived their executive functioning skills, compared with how their mothers perceived their sons’ executive functioning skills. Chapter 1 outlines the background to the study, including my motivation for undertaking it, and the long and winding road that led to the topic. The chapter details the scope and purpose of the study and lays out for the reader a map for the remainder of the exegesis.

Each chapter in this exegesis aligns with sections of the accompanying portfolio. The exegesis and portfolio combined detail how this study is grounded in and subsequently informs clinical practice in the field of paediatric brain injury rehabilitation.

1.1 Motivation for completing this study

As a speech pathology student I was fortunate to obtain employment as a research assistant with a multidisciplinary, longitudinal study at the Royal Children’s Hospital (RCH), Melbourne, Australia, investigating the long-term outcomes for children who had acquired a traumatic brain injury (TBI). As a consequence of my involvement with this study I was offered the opportunity to undertake my final workplace learning placement with the speech pathology department at RCH. The majority of my placement was with the inpatient neurological ward at RCH, where my interest and intrigue with TBI began. I have worked with the South West Brain Injury
Rehabilitation Service (SWBIRS) in Albury, New South Wales (NSW), Australia, since 1999, and for most of this time have been the speech pathologist with “The Kids’ Team” at this service. The SWBIRS is one of 15 specialist brain injury rehabilitation units in NSW, and the only non-metropolitan unit of this network with a multidisciplinary paediatric rehabilitation team. With the location of SWBIRS on the NSW–Victoria state border, The Kids’ Team provides community-based therapy and case management services to children with TBI who live in southern NSW and north-eastern Victoria. My experiences working with children and adolescents post-injury have exposed me to the many challenges associated with engaging young people in rehabilitation, and to the inadequacies of traditional models of health care and rehabilitation in serving this population.

The Kids’ Team supports children and adolescents with TBI, their families and schools, across a large geographical area. Although the team was initially established to provide case management and consultative therapy services only, it was soon apparent that many allied health clinicians working in the rural and regional towns serviced by The Kids’ Team did not have the knowledge, competence, or confidence to provide rehabilitation services to children post-injury. In response, The Kids’ Team began to provide long-term specialised rehabilitation and case management services, adopting the “contextualised rehabilitation framework” developed by Mark Ylvisaker and Tim Feeney (1998a). This framework promoted the establishment of collaborative relationships
between therapists and people with TBI and their support networks, with intervention that occurred in the everyday contexts of the person with TBI and delivered by the everyday people who supported that person (Ylvisaker & Feeney, 1998a). Learning to deliver clinical services in this non-traditional approach only served to strengthen my interest and passion for TBI rehabilitation.

I have had the privilege of working with many young people on a long-term basis post-injury. I have supported some children, adolescents, and their families for more than 10 years. Collaborating with clients for this length of time has allowed me to see, first-hand, the evolving outcomes of paediatric TBI coupled with the typical behavioural, attitudinal, and motivational hallmarks of adolescence. I have worked with many adolescents who continued to attend and participate in therapy sessions but who, outside this context, were disengaging with school, struggling to apply skills learned in therapy to their real-world environments, and who continued to experience a decline in their social relationships. I have also worked with many adolescents who were willing to attend therapy sessions as long as the rehabilitation did not encroach on their day-to-day lives and make them stand out among their peers. I have worked with adolescents who were keen to adopt routines and strategies that helped them to negotiate their everyday contexts more successfully and who were able to integrate the consequences of their TBI with their sense of self and identity. Through these many clinical experiences, I began to wonder two things: why do adolescents with TBI who have been engaged with
rehabilitation services for a long time continue to attend therapy sessions? (i.e., why do they keep turning up?), and how do adolescents who have been engaged in cognitive rehabilitation for many years perceive their executive functioning skills? (i.e., has all this work made any difference to how confident and competent these adolescents feel about their cognitive skills?). I wanted to know if what I was doing as a cognitive therapist was making any difference at all for these young people, and similarly, if the model adopted by The Kids’ Team was meeting their needs.

1.2 The evolution of this study

The research study presented in this exegesis is by no means the original topic undertaken for my doctoral degree. Section One of the accompanying portfolio contains several pieces of work that focus on my initial topic, the use of Wilderness Adventure Therapy (WAT) in cognitive rehabilitation programmes for adolescents with TBI. To complete the proposed study I needed a funding grant to pay for the delivery of the WAT programme. Unfortunately, I was unable to secure a funding grant in a timeframe that matched that of my doctoral studies. Yet the literature I had read regarding WAT, including the therapeutic aims of WAT and its use with at-risk youth, influenced my second topic choice.

Throughout my clinical career, many classroom teachers have commented how the learning difficulties experienced by students with TBI are “not that different to half the class” they are teaching. In researching the use of WAT with adolescent populations I had increased my knowledge base and my interest in the youth-at-risk population. Through my reading, I
hypothesised that the functional difficulties described in the youth-at-risk literature, such as behavioural difficulties, poor judgement and reasoning skills, limited planning and organisational skills, were quite similar to the many impairments experienced by children and adolescents post-TBI. I began to wonder if there was merit in teachers’ comments about the similarities between the post-injury difficulties I was describing about a student in their class and the day-to-day difficulties they encountered in teaching many students within their classrooms. Thus, the second topic proposed for my doctoral studies, and the topic that forms the majority of the work presented in Section Two of the portfolio, aimed to describe how students who were academically at-risk, those non-at-risk, and head-injured adolescents approached executive functioning tasks. The study was also designed to describe how these three cohorts of students perceived their executive functioning skills compared with how their primary caregivers and a classroom teacher perceived each student’s executive functioning skills.

This proposal received ethics approval from Charles Sturt University, Greater Southern Area Health Service and the Sandhurst Diocese Education Office. Unfortunately, due to a delay in the ethics approval process with the NSW Department of Education, my second research proposal was abandoned, again due to competing demands within the timeframe available. However, the research presented in this exegesis is a derivative of the second topic. The ultimate project sought to describe how
adolescents with TBI perceived their executive functioning skills compared with how their mothers perceived those skills.

Each topic that was explored and developed for my doctoral study was linked by a common factor: my desire to determine appropriate rehabilitation practices for adolescents with TBI. The purpose and scope of the study described in the remainder of this exegesis is now detailed.

1.3 Purpose and scope of study

The purpose of this study was to achieve a detailed understanding of how adolescents with childhood TBI, who had participated in cognitive rehabilitation over a long-term, perceived their executive functioning skills. This knowledge was sought to inform future developments in models of care across the field of paediatric TBI rehabilitation. To achieve a detailed understanding of how adolescents with TBI viewed their executive functioning skills a mixed methods approach was applied. This study used three research stages to collect quantitative data (standardised and ecological clinical assessments) and qualitative data (self-reflections, observation and unstructured interviews).

To achieve a depth of understanding of how adolescents perceived their executive functioning skills, and how this compared with their mothers’ perceptions, a small number of participants were recruited. Two adolescents and their mothers participated in this study. The decision was made not to recruit more participants, but rather to compile a case study for each adolescent to ensure that each adolescent’s journey through rehabilitation was understood from a historical and broad perspective. The
development of each case study highlighted connections between comments from treating clinicians at the time of intervention and perceptions voiced by each participant during data collection.

The participants were recruited from the same specialised paediatric rehabilitation service which uses a service delivery model that is beginning to be adopted by many TBI rehabilitation teams across Australia. Paediatric and adolescent TBI rehabilitation is an emerging field; consequently, there are few published reports of adolescents’ experiences of long-term cognitive rehabilitation. Despite this study’s small number of participants, it offers unique insight into how adolescents perceive their executive functioning skills following long-term cognitive rehabilitation, and offers suggestions for the development of age-appropriate models of care to ensure that children and adolescents with TBI receive care in the right place and at the right time.

1.4 An overview of the exegesis

This exegesis is presented in three sections, which align with the three sections used in the accompanying portfolio of works. In the exegesis, each section contains a number of chapters that reflect the major sections of my study. Because of the word limit imposed on the reporting of this study, findings with the greatest clinical impact are presented in this exegesis. Data and interpretations of other findings from this study are located in the portfolio.
Section One, Setting the Scene, provides the background information to this exegesis. Besides this introductory chapter, Section One contains Chapter 2, the literature review. Chapter 2 addresses a number of topics including the mechanisms of injury, epidemiology, and sequelae of TBI, as well as an overview of the field of cognitive rehabilitation, the developmental phase of adolescence, and three key models of development. The literature review aims to provide readers with the current context of TBI in Australia and evidence for best practice in paediatric and adolescent rehabilitation. It identifies several gaps in the knowledge base of paediatric TBI rehabilitation and the corresponding need for this study.

Section Two, Research Approach, contains Chapters 3 and 4. Chapter 3 presents the methodology of this study, including the research paradigm and approach and participant selection, and details the study design via description of the phases of data collection. The techniques used in data analysis are also described in this chapter. Chapter 4 presents the key findings of the study. Each key finding consists of a number of elements, and the elements of each theme are explained individually and then drawn together in a discussion alongside relevant literature. This process builds the interconnected evidence base that exists across the themes.

Section Three, Implications for Practice, contains Chapters 5 and 6. Chapter 5 synthesises the findings of this study with pivotal models of adolescent development and cognitive rehabilitation to present a framework for clinical practice, the “ripe for rehab” framework. This
framework is the major clinical contribution and culmination of this study. Chapter 6 outlines the limitations of the study but also outlines future directions for research. The unique contributions of this study to the field of paediatric TBI rehabilitation are highlighted in the conclusion to this exegesis.
Chapter 2
The maturing of paediatric TBI rehabilitation

Introduction

Like the population it serves, the field of paediatric TBI rehabilitation is growing up. Several longitudinal studies have now documented the chronic impairments across a range of functional domains that are associated with TBI acquired in childhood (for example V. Anderson & Catroppa, 2005; V. Anderson, Catroppa, Morse, Haritou, & Rosenfeld, 2005a; C. A. Hawley, 2003; Tomlin, Clarke, Robinson, & Roach, 2002). Perhaps of greater concern is the fact that due to neurodevelopment, children who sustain a moderate to severe TBI effectively “grow into” their disability as they move through childhood and into adolescence (V. Anderson & Ylvisaker, 2009). Such research findings mean that the field of paediatric TBI rehabilitation has had to mature in recent years, so as to be able to offer the timely services, knowledge, and support that children, adolescents, their families, teachers, and friends all need, to overcome the often chronic functional impairments that emerge consequent to TBI.

TBI is the leading cause of disability in children and young adults (NIH Consensus Development Panel, 1999). It is often referred to as a “hidden disability” by survivors and their families (Laatsch et al., 2007), due to the lack of outward physical indicators of underlying deficits. In the moderate to severe ranges, TBI results in residual functional impairments across
cognitive, behavioural, physical, and communication skills (Levin & Hanten, 2005; Ylvisaker, 1998). The constellation of deficits that are common following a TBI affect educational, social, and vocational pursuits, and there is a documented burden on families and communities from a social and economic perspective (V. Anderson & Catroppa, 2006; J. K. J. Harris, Godfrey, Partridge, & Knight, 2001; NIH Consensus Development Panel, 1999). The effect of TBI can be all-encompassing, and research has now consistently shown that moderate to severe TBI acquired in early childhood has persistent effects that often worsen with age (V. Anderson & Ylvisaker, 2009).

Compared with other health fields, TBI research is in its infancy. Research addressing paediatric TBI in particular has emerged only in the past few decades. Research efforts have addressed mechanisms of injury, the functional impact of injury, and appropriate models of rehabilitation, with much research being discipline-specific endeavours (V. Anderson & Ylvisaker, 2009). The past decade has seen a proliferation in literature describing residual impairments following paediatric TBI. There have also been calls for the development of rehabilitation and service delivery models that address the needs of children and young people with TBI, rather than merely borrowing models designed for adults (V. Anderson & Catroppa, 2006). The provision of post-TBI rehabilitation to the paediatric population is an increasingly recognised specialised field, with the acknowledgement that direct and interdisciplinary rehabilitation
approaches need to be coupled with approaches that accommodate developmental factors.

The focus of this chapter is on literature addressing paediatric TBI. Mechanisms of injury and epidemiology are outlined prior to an overview of the functional sequelae of childhood TBI. A brief history of TBI rehabilitation is then presented before descriptions of various approaches to cognitive rehabilitation are outlined. Discussion then addresses the developmental period of adolescence and three theoretical models that have become central to the ensuing exegesis: the social development model (Catalano & Hawkins, 1996), self-determination theory (Ryan & Deci, 2000b) and self-systems process model (Connell & Wellborn, 1991). The chapter concludes with a discussion of identity development, a task central to the period of adolescence and, metaphorically speaking, the stage in which the field of TBI rehabilitation now finds itself.

2.1 Traumatic brain injury: definition, incidence and sequelae

TBI is broadly defined as brain injury acquired as a result of externally inflicted trauma (NIH Consensus Development Panel, 1999). The Australian Institute of Health and Welfare (AIHW) has defined TBI as a subgroup of acquired brain injury (ABI), any brain-related damage acquired after birth. TBI is the most prominent subgroup of ABI, and the AIHW has identified a TBI as an injury caused by a traumatic event (e.g. a blow to the head) (AIHW, 1999).
Unlike other ABIs, which can have a gradual or degenerative course, TBI is typified by sudden onset (R. H. Brookshire, 2003). In terms of policy development, ABI is a recognised disability group in Australia, and in 1994 the Commonwealth and State Governments passed a “National Policy on Services for People with Acquired Brain Injury” in recognition of the impact of ABI at individual, family, community, and societal level (Department of Human Services and Health, 1994).

2.1.1 Mechanism of injury

TBI is commonly thought to be the result of injuries sustained as a passenger within a motor vehicle accident. Although this is true for most injuries acquired in adulthood (Khan, Baguley, & Cameron, 2003; Tate, MacDonald, & Lulham, 1998), different mechanisms of injury are prominent in different age sub-groups within the paediatric population (children aged 1 year to 16 years, 11 months). For example, Hawley (2003) interviewed and assessed 97 children (49 with mild, 19 with moderate, and 29 with severe TBI) from the UK at 2 years post-injury to ascertain common impairments of paediatric TBI. Hawley reported that approximately 32% of participants had sustained TBI as a result of pedestrian rather than motor vehicle incidents, 29% had incurred an injury following a fall, 10% had fallen from a bicycle, and only 6% had sustained TBI as a passenger within a vehicle involved in an accident. A longitudinal Australian study of the outcomes of injury 30 months post-insult (V. Anderson, Catroppa, Morse, Haritou, & Rosenfeld, 2005b), in which 149 children admitted to the Royal Children’s Hospital, Melbourne with a diagnosis of TBI were recruited, supported Hawley’s findings. Demographic data reported by Anderson et
al. showed that most children in the three age groups (infants: 0 – 2 years 11 months; young: 3 – 7 years 11 months; and old: 8 – 12 years 11 months) sustained TBI as a result of a fall or from being a pedestrian in pedestrian versus motor vehicle incidents. A 62% increase in falls-related TBI was recorded from 2002 to 2006 for children aged below 14 years seen in emergency departments in the United States (Faul, Xu, Wald, & Coronado, 2010). Not surprisingly, Anderson et al. (2005b) reported that mild or moderate injuries were more commonly associated with falls and severe injuries with motor vehicle related injuries.

TBI can be separated into two types, blunt or penetrating trauma. Blunt trauma is most common in the paediatric population (Catroppa & Anderson, 2006). Blunt trauma TBI is also known as non-penetrating or closed head injury. In this type of injury, primary brain damage can be caused by cerebral contusions or diffuse axonal injury (DAI). Contusions are sites of damage secondary to the brain tissue striking the rough surface of the interior of the skull, resulting in focal bruising. DAI results from the brain oscillating within the skull and twisting in response to the external force that has struck the head. The unpredictable and uncontrollable nature of the accelerating-decelerating brain movement in response to the external force causes shearing of neuronal pathways. Furthermore, the acceleration-deceleration movement associated with blunt head trauma results in the frontal and temporal lobes of the brain being the most commonly injured regions post-TBI, which indicates why cognitive, behavioural, and communication difficulties are commonplace post-injury
(Catroppa & Anderson, 2006). The combination of contusions and DAI results in surface and deep tissue damage, and the temporal-frontal injuries sustained all manifest into the often complex and chronic impairments associated with TBI. For children experiencing ongoing brain development, such diffuse damage can interrupt neuronal development, with typical processes such as neuronal myelination and frontal lobe maturation being affected (Hudspeth & Pribram, 1990).

In conjunction with these primary mechanisms of injury, secondary causes of TBI contribute to the breadth and level of injury severity. Secondary causes of injury include the many normal pathophysiological responses to the primary injury, such as oedema, increased intracranial pressure, haemorrhage and hypoxia. Medical advances in managing the secondary causes of injury, as well as improvements in medical transportation and the development of specialist treatment services for people who have sustained TBI, have resulted in higher numbers of people now surviving TBI (Khan et al., 2003; NIH Consensus Development Panel, 1999).

2.1.2 Epidemiology

Variability exists in international incidence rates for TBI due to differences in study methodologies, regional variations, study length, the International Classification of Diseases (ICD) codes used, and lack of adjustment for multiple hospital admissions (Fortune & Wen, 1999; O'Connor, 2002). However, TBI has been noted to be more common than burns or poisonings in the paediatric population, with data suggesting that
one in every 20 presentations to an emergency department at a paediatric hospital is for a TBI (V. Anderson & Yeates, 2010). Regardless of age, TBI is the leading cause of hospitalisation, disability, and death worldwide (Bruns & Hauser, 2003).

Using the number of hospital separations for TBI in Australia in 2004-05, the AIHW has estimated a rate of 107 per 100,000 population (AIHW, 2007). This figure has remained relatively stable since previous data collection by the AIHW in 1999-2000 (AIHW, 2007). Within this cohort, Australian data has also consistently shown a higher incidence of TBI for males, especially in the adolescent and young adult age ranges. Australian data from 2004-05 shows that hospitalisation rates for males per 100,000 population were 2.5 times those for females (Helps, Henley, & Harrison, 2008), and comparative US data collected between 2002 and 2006 shows that hospitalisation rates for males were 1.4 times those for females.

Across the 2004-05 data collected in Australia, nearly 60% of all hospitalisations were for persons aged 15–64 years, with those aged between 15 and 19 years having the highest age-specific rate of TBI at 284 per 100,000 population (Helps et al., 2008). Such over-representation of the 15-19 years age cohort suggests the need to consider the development of care pathways and rehabilitation models specifically for adolescents. Among all this data, the authors noted that within the 0-14 years age group, the age-standardised rate of TBI declined over the period 1999-2000 to 2004-05 from 120 to 93 per 100,000 population (Helps et al., 2008). The highest probability of survival from falls, assaults, and vehicle-related
accidents occurred within this age range, and more specifically in the 10-14 years age group (Helps et al., 2008).

Despite the promising reduction in TBI in the under 14 years age group, the above findings must be interpreted with caution. The data were based on hospital separations, “the process by which an episode of care for an admitted patient ceases” (Department of Health, 2011). As such, it does not capture the high proportion of mild TBI attributed to sporting accidents and falls. Many of these cases are known not to present to hospital (Cripps & Harrison, 2008). This issue is of particular concern to paediatric TBI related research, as the majority of TBI sustained by children is considered to be of mild severity, and so the estimated rate is likely to be under-reported. Although mild TBI generally results in few, if any, long-term deficits, it has been estimated that 10-15% of mild TBI produces persistent post-concussive symptoms, including ongoing headaches and vestibular changes, difficulty with attention and memory, sleep disturbances and behavioural changes (V. Anderson et al., 2005b; Khan et al., 2003).

The sequelae of TBI, regardless of age of injury, can be broadly grouped into physical, cognitive, behavioural, communication, and social impairments. Specific paediatric outcome studies have consistently shown different profiles for children injured at different ages and with injuries of differing severity. In keeping with the focus of this study, the following section outlines the common cognitive sequelae of paediatric TBI. Although disruptions to the other domains are acknowledged, it is the cognitive sequelae, and in particular, executive dysfunction typical of TBI, that are
regularly reported as the most pervasive consequences of TBI. In the paediatric population, cognitive dysfunction post-injury underpins much long-term academic, vocational, adaptive, and social impairment.

2.1.3 Sequelae

Humans rely on cognition, emotion, memory, behaviour, language and physical abilities “in order to function and prosper” (Helps et al., 2008, p.2). The consequences of TBI are complex. Rather than producing one set of clearly delineated impairments, TBI “often influences human functions along a continuum” (NIH Consensus Development Panel, 1999, p. 976). Although TBI can result in long-term physical disability, many have argued that the complex neurobehavioural changes have the greatest impact on quality of life (Khan et al., 2003; Ylvisaker et al., 2005). Cognitive and behavioural changes, difficulty establishing and maintaining personal relationships, and disruptions to school and work have been reported by survivors of TBI as the most debilitating sequelae (Khan et al., 2003; NIH Consensus Development Panel, 1999). The consequences of TBI affect individuals, their family and friends, community, and society. For a school-aged child, TBI can result in lack of academic, vocational, social, and interpersonal success, primarily as a result of cognitive deficits post-injury (V. Anderson & Ylvisaker, 2009; Gardner, Bird, Maguire, Carreiro, & Abenaim, 2003).

2.1.3.1 Cumulative effects

It has been well documented that moderate to severe TBI sustained in childhood can have long-lasting and cumulative effects (V. Anderson et al., 2005b; Blosser & DePompei, 1994; Chapman, Nasits, Challas, & Billinger,
Researchers have concluded that, over time, injury to the frontal lobes leads to an increase in the frequency of disability, particularly in areas of behavioural regulation, psychosocial adjustment and academic functioning in children (Ylvisaker & Feeney, 1998a). Reduction in the ability of children with TBI to interact with the environment can result in impaired skill acquisition and an increasing gap between their functioning and that of their peers (V. Anderson & Catroppa, 2006).

It is now commonly accepted that persisting difficulties may worsen over time, depending on variability in injury. This variability includes the type of injury (penetrating/non-penetrating, motor vehicle accident/fall), severity (mild, moderate, severe), age at injury (≤ 3 years, 3-7 years, post-7 years), pre-injury factors (academic abilities, personality, behaviour, family environment), secondary injuries (increased intracranial pressure, hypoxia, haemorrhaging), and post-injury factors (availability of medical care, quality of acute rehabilitation, long-term supports) (V. Anderson et al., 2005b; V. Anderson & Ylvisaker, 2009; Ylvisaker & Feeney, 1998a). Research has also shown that due to the development of cognitive skills during childhood, new difficulties can emerge as expectations of maturity and the academic environment increase (V. Anderson et al., 2005b).

In a landmark study of cognitive outcomes 30 months post-injury, Anderson et al. (2005b) supported the long held belief that more severe injuries result in poorer functional outcome, and they also demonstrated the relative vulnerability of the immature brain. Anderson et al. (2005b) conducted a prospective longitudinal study that recruited 149 children
admitted to the Royal Children’s Hospital, Melbourne. Among the participants, 122 acquired a TBI between the ages of 3 years 0 months and 12 years 11 months. An additional group of 27 children injured prior to 3 years of age was also recruited. Participants were divided into three groups according to age at injury and injury severity: infant TBI (n = 27), birth to 2 years 11 months at injury; young TBI (n = 53), 3 years 0 months to 7 years 11 months at injury; and old TBI (n = 69) 8 years 0 months to 12 years 11 months at injury. Severe, moderate and mild injury groups were also established using the Glasgow Coma Scale (GCS) at admission to hospital, and the results of a computerised tomographic (CT)/magnetic resonance imaging (MRI) scan.

The aim of the study was to examine the relationship between age at injury, severity of injury, and recovery. The authors aimed to plot changes in cognitive ability for the first 30 months following childhood TBI and to examine the impact of age at injury and severity of injury on cognitive outcomes. Although age of injury was not significant for participants with mild injuries, it was significant for those with moderate and severe injuries; the younger the age at which a moderate or severe injury occurred the poorer the outcome. The authors attributed this to consequences of the primary and secondary injuries sustained, as well as the immature skill and knowledge of young children. Cognitive changes post-injury, such as slowed processing and poor attention skills, can affect later skill acquisition that underpins the cumulative effect associated with early childhood injury in the moderate and severe ranges.
2.1.3.2 Cognitive impairments

Impairments of cognitive functioning were often the most prominent and long-lasting sequelae of TBI, and a significant cause of disability (Cicerone et al., 2000). Cognition was defined as the process of knowing. It included the ability to select, acquire, comprehend, and retain information, and the “expression and application of knowledge in the appropriate situation” (Cicerone et al., 2000, p. 1596). Flavell et al. (1993), cited in Ylvisaker (1998), described cognition as the mental processes, operations, and system that explain the acquisition and use of knowledge, but their description also indicated that cognition was represented in organised, goal-directed behaviour. Common manifestations of reduced cognitive skills following TBI include: memory impairments, particularly working memory and prospective memory; reduced attention and concentration skills, which, from a functional perspective, often result in reduced persistence or decreased effectiveness when performing routine daily tasks; visual perceptual difficulties; and impaired executive functions of planning, problem solving, abstract reasoning, organisation, insight, and judgement (Cicerone et al., 2000; Lovasik, Kerr, & Alexander, 2001; NIH Consensus Development Panel, 1999; Prigatano, 1986).

In a review of 116 studies relating to cognitive effects of mild TBI, Beers (1992) concluded that the consequences of mild TBI can be particularly devastating to young people. Only 15 of the articles reviewed by Beers addressed mild TBI in children and adolescents. Yeates and Taylor (2005) summarised literature regarding neuropsychological and behavioural outcomes following mild TBI in children and adolescents, and
found contradictory results for this population. Some studies they reviewed, which they reported were methodologically sound, provided little evidence of ongoing cognitive difficulties resulting from mild TBI. Conversely, they also noted that children with mild TBI were found to exhibit a variety of cognitive difficulties “that [were] more frequent and severe than those reported by children with injuries not related to the head” (p. 6), and that persisted beyond the presence of such difficulties on standardised testing. Yeates and Taylor stated that such difficulties could be the source of significant functional morbidity.

For injuries within the moderate to severe ranges there is no doubt that cognitive impairments are cornerstone features of post-injury profiles. For many, disruptions to their ability to process, interpret, consider, and retrieve information so as to formulate a response, and then apply knowledge so as to achieve meaningful goals within everyday contexts, are the most frustrating and pervading difficulties post-injury (Ylvisaker & Szekeres, 1998). Once again though, age at injury influences a child’s level of improvement post-injury. In the prospective longitudinal study of Anderson et al. (2005b) there is good evidence to show that within the severe TBI cohort, children who sustained severe, early insults (between 3 and 7 years of age) showed the least recovery of skills. Children who sustained a severe injury between 8 and 12 years showed a steep recovery trajectory in the first 12 months post-injury and then a more flattened trajectory. Of particular note is the finding that verbal skills were quite vulnerable to severity of injury, regardless of age of injury. Anderson et al.
attributed this to the fact that language skills are in a rapid state of
development throughout childhood and are thus especially exposed to
injury.

In summary, Anderson et al. (2005b) reported that children who
sustained a severe TBI typically experienced ongoing cognitive sequelae,
despite exhibiting the greatest improvement of skill in the first 12 months
post-injury. Children who sustained an injury between 3 and 7 years of age
showed the least recovery of skill, and children who sustained a mild TBI,
regardless of age, generally showed little impact of injury, though a small
group experienced persistent cognitive difficulties that were sufficiently
significant to affect functional outcome. Cognition encompasses a variety
of skills and abilities that enable humans to acquire and apply knowledge.
Attention and memory are components of cognition that were routinely
affected post-injury, but it was disruption to the executive system, the
skills that govern goal-directed behaviour, that had the greatest impact on
long-term outcome post-injury.

2.1.3.3 Executive function (EF) impairment

In general terms, EFs are considered to be a component of cognition.
However, the frequency, chronic nature, and pervading significance of EF
impairment post-TBI warrants separate mention of this system. The term
executive conveys the notion that these functions control and coordinate
an individual’s thoughts and behaviours (Blakemore & Choudhury, 2006;
Ylvisaker, 1998). The executive system is most commonly understood to
involve mental functions related to formulating, planning, performing and
reviewing goals (Ylvisaker & Feeney, 1998a). Viewed in this broad sense, EFs direct deliberate cognitive behaviour (e.g. paying attention), communication behaviour (e.g. planning how to express a thought), social behaviour (e.g. inhibiting aggressive behaviour), academic behaviour (e.g. studying for an exam), and vocational behaviour (e.g. planning a day at work so that tasks can be achieved) (Ylvisaker & Feeney, 1998a). One of the main reasons for post-injury disruption to EFs is that these functions are associated with the prefrontal cortex and that mechanisms of injury often result in frontal lobe contusions.

Researchers such as Levin and Hanten (2005) and Taylor and Alden (1997) have organised the many lists of executive functioning components available by using factor analytic processes. Levin and Hanten derived five factors and Taylor and Alden derived three factors. Although both studies used similar analytic procedures, each used a different battery of neuropsychological tests and different population cohorts. Ylvisaker and Feeney (1998a) cited both studies in their comprehensive text addressing brain injury intervention. They concluded that while the attempts to streamline the described components of EF were admirable, using factor analytic processes was inappropriate. Such processes rely entirely on the tests and tasks selected for administration, and so components that are not assessed via standardised measures, but which are critical components of EF, are not included in the list of factors identified. Ylvisaker and Feeney listed components likely to be missed by this process: self-awareness of
strengths and weaknesses, initiation, ongoing monitoring of performance, and problem solving in stressful situations.

Executive function components are particularly vulnerable to TBI (NIH Consensus Development Panel, 1999; Ylvisaker & Feeney, 1998a). Much has been written about EF impairment post-injury as well as approaches to the rehabilitation of these skills (for example: V. Anderson & Catroppa, 2006; Catroppa, Anderson, & Muscara, 2009; Kennedy et al., 2008; Laatsch et al., 2007; Prigatano, 1986; Sohlberg, Todis, & Glang, 1998; Ylvisaker et al., 2005; Ylvisaker & Feeney, 1998a; Ylvisaker & Feeney, 2009; Ylvisaker & Szekeres, 1998). It has now been recognised that impairment and subsequent rehabilitation of EF impairment in children must be considered within a developmental framework. Research has repeatedly shown that EF has a protracted developmental path, continuing through childhood and adolescence and into early adulthood (Blakemore & Choudhury, 2006). EF development coincides with the maturational changes in grey and white brain matter that occur during these same developmental periods and the resultant structural changes that occur in the prefrontal and parietal cortices (Blakemore & Choudhury, 2006; Hudspeth & Pribram, 1990). Accordingly, progress and mastery of the many skills associated with EF is often disturbed as a consequence of childhood TBI (V. Anderson & Ylvisaker, 2009). Such disruption affects a child’s ability to “develop normally and interact effectively with the environment, thus leading to ongoing cognitive, academic, and social disturbances” (V. Anderson & Ylvisaker, 2009, p. 254). Clearly, then, there is a need for long-term,
specialised rehabilitation follow-up to support child and family through developmental transitions, to negotiate new challenges and to provide information and education to those who support the child.

2.2 Cognitive rehabilitation

The World Health Organization (WHO, 2012) defines rehabilitation as “a process aimed at enabling [people] to reach and maintain their optimal physical, sensory, intellectual, psychological, and social functional levels. Rehabilitation provides people with disabilities with the tools they need to attain independence and self-determination” The NIH Consensus Development Panel (1999) identified the role of cognitive rehabilitation as enhancing a person’s capacity to “process and interpret information” (p. 978) and to increase or improve the person’s ability to function in all aspects of family and community life. Cognitive rehabilitation is delivered by a diverse range of professionals, each bringing different educational backgrounds and practice frameworks to the field. Paediatric cognitive rehabilitation practices are, in effect, a melting pot of frameworks and approaches from these different professions, as well as different theoretical work often sourced from related fields such as education and developmental disability. The relative infancy of cognitive rehabilitation has necessitated such hybrid models, and yet the pervading impact of TBI across functional domains allows practitioners to learn from these related fields. Moreover, research into rehabilitation is complicated by clinical heterogeneity. This diversity, coupled with the heterogeneity of impairments associated with TBI, creates challenges for designing methodologically rigorous studies to ascertain treatment efficacy...
(Ylvisaker, Hanks, & Johnson-Greene, 2002). As a consequence, different approaches to cognitive rehabilitation have emerged, as well as some strong criticisms.

This section begins with a review of the historical development of cognitive rehabilitation and then presents a dichotomy of paradigms, the traditional paradigm and its contemporary counterpart, the contextualised paradigm. Different approaches to cognitive rehabilitation are overviewed. Extensive discussion of each is not provided, as the point is to acknowledge rather than dissect the different models of intervention before moving to a more detailed discussion of the contextualised paradigm.

2.2.1 The development of cognitive rehabilitation

Cognitive rehabilitation gained prominence during the First and Second World Wars. Rehabilitation centres were established to treat the many returning servicemen who required neurological treatment and rehabilitation (Poser, Kohler, & Schonle, 1996). Early attempts at neuropsychological rehabilitation were undertaken by well-known pioneers such as Kurt Goldstein in Germany and, Alexander Luria in Russia (Christensen & Caetano, 1996; Poser et al., 1996). In the 1970s, cognitive rehabilitation gained momentum in the US as a consequence of improved emergency medicine practices and thus, greater survival rates from severe TBI (Ylvisaker et al., 2002). This was also the time of the Yom Kippur War (1973) which saw rehabilitation centres established, again for servicemen, through collaboration between the Israeli Ministry of Defence and the New York University Institute of Rehabilitation Medicine. During this time, what
has become known as the “traditional approach” was developed and applied by a number of practitioners, including Ben-Yishay and colleagues at the Rusk Institute TBI programme at New York University (Muir Giles, 1994; Ylvisaker, 2003; Ylvisaker et al., 2002).

2.2.2 The “traditional approach” to cognitive rehabilitation

The traditional approach to cognitive rehabilitation dominated practice throughout the 1970s and 1980s. Using repeated administration of hierarchically organised tasks which targeted specific components of cognitive processes, the aim was to reduce or eliminate the underlying cognitive impairment (Sohlberg & Mateer, 1989; Ylvisaker, 2003; Ylvisaker et al., 2002). The approach drew on the results of formal assessment of cognitive functioning to profile areas of weakness and areas of strength that could be used to compensate for weaker skills. In this approach, cognition was viewed as discrete, separable components that could be individually measured and strengthened through exercises. Component specific skill development then translated to improved daily functioning (Sohlberg & Mateer, 1989; Ylvisaker et al., 2002). This approach used restorative or curative techniques but when they failed, compensatory and sometimes environmental approaches were used. These three core approaches, direct, compensatory, and environmental, are now described.

2.2.2.1 Direct approach

In this approach specific, exercises were used to target the identified cognitive impairment through hierarchically organised, massed-practice trials. Treatment was typically undertaken in a decontextualised clinic setting. The aim was to retrain lost functions and maximally stimulate
impaired functions (V. Anderson & Catroppa, 2006). Although this approach was effective for some cognitive skills such as attention retraining, there was little evidence to support its use in other domains (V. Anderson & Catroppa, 2006; Catroppa et al., 2009). As a consequence of this early treatment modality, cognitive rehabilitation was criticised for lacking actual benefit to the person with TBI and for limited skill generalisation outside the specific, structured activities (Fujii, 1996). It was also criticised for focusing on impairment as made apparent by formal testing rather than on the disability that affected the person’s everyday functioning (V. Anderson & Catroppa, 2006)

2.2.2.2 Compensatory approach

The use of compensatory cognitive mechanisms or the introduction of external systems and devices to compensate for impairments was another common, and perhaps the most popular, approach to intervention across the many disciplines that delivered cognitive rehabilitation (V. Anderson & Catroppa, 2006; Ylvisaker et al., 2002). In this approach, individuals with TBI were taught to perform tasks and activities using alternative strategies, thereby compensating for cognitive deficits (V. Anderson & Catroppa, 2006). The aim was to lessen the impact of cognitive impairment and maximise the use of cognitive strengths post-injury to ensure optimal performance in everyday activities. Training tended to occur in the form of discreet massed trials in decontextualised settings (Ylvisaker et al., 2002).

Within the compensatory framework, external aids such as lists, diaries and alarms were commonly used. Advances in information technology
have made devices such as smartphones and tablets more accessible to people with TBI. Although such devices are considered to be more mainstream, the advances also meant that a new and evolving skill set was required by cognitive therapists to support the selection, training and generalisation of such devices (DePompei, Gillette, Goetz, Xenopoulos-Oddsson, & Dowds, 2008). Research into the appropriateness and functional impact of these new devices is required, as therapists and people with TBI are cautioned that they are not the panacea for all cognitive difficulties (DePompei et al., 2008).

2.2.2.3 Environmental modification

An environmental approach to cognitive rehabilitation relied on the collaboration of various support people (family, teachers, coaches and peers) to identify potential barriers or obstacles to optimal performance, and to reduce or eliminate them. For example, in the home context, this could include parents establishing a daily routine for their child to follow when preparing to go to school and removing distractions so the routine could be followed; in the school context it could involve reducing the amount of work presented at one time and allowing extra time for the child to complete tasks (Blosser & DePompei, 1994).

Anderson and Catroppa (2006) argued that such an approach was useful when restorative and compensation methods were no longer proving helpful, but they acknowledged that it was best adopted when recovery had stabilised and residual deficits were apparent. The environmental approach was criticised for assuming that the child post-

---

30
injury would show little “internal improvement” (V. Anderson & Catroppa, 2006, p. 774), but Ylvisaker and colleagues postulated that such an approach could be used in conjunction with task-specific training and compensatory methods when required, to help the child to experience success with real-world cognitive tasks in real-world contexts (Ylvisaker et al., 2002). The “context-sensitive” paradigm is based on the assumptions that “cognitive functioning is essentially connected to individuals’ goals, emotions, contexts of action and domains of content, and that aspects of cognition are essentially interconnected” (Ylvisaker, 2003, p. 2). The context-sensitive paradigm is described next, following a review of the theoretical works of Lev Vygotsky, whose sociocultural approach to cognitive development anchors the contextualised paradigm.

2.2.3 Rehabilitation in the Vygotskyan spirit

Alexander Luria is has been described as “a founding father of neuropsychology” (Goldberg, 1990, p. 1) with neuropsychological rehabilitation largely based on his model of brain functioning and approach to brain injury rehabilitation (Christensen & Caetano, 1996). Luria himself, though, admitted that his work was significantly influenced by his compatriot, colleague, and teacher, Lev Vygotsky, another Russian psychologist intent on producing a new “comprehensive approach to human psychological processes” (Christensen & Caetano, 1996, p. 283).

Luria wrote, “it was Vygotsky who foresaw new ways” to reconstruct the over-simplified view of psychology that had been popularised by the 1920s (Luria (1979, p. 41) as cited in Christensen & Caetano, 1996). Luria
consistently credited Vygotsky’s contributions to his own work, yet, in 1998, Ylvisaker and Feeney wrote that “Vygotsky’s theories of cognition and cognitive development have rarely been applied in publications that specifically deal with brain injury rehabilitation” (p. 13). This was despite the widespread adoption of Vygotsky’s sociocultural approach to cognitive development in other related areas such as developmental-cognitive psychology, educational psychology, speech pathology, and other paramedical professions (Ylvisaker & Feeney, 1998a).

In his social development theory, Vygotsky argued that social interaction preceded cognitive development. Through socialisation, cognition is developed. Vygotsky stated three primary concepts of his theory:

1. Social interaction has a fundamental role in the process of cognitive development. “Every function in the child’s life appears twice: first on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological)” (Vygotsky, 1978, p. 57).

2. The “more knowledgeable other” (MKO) refers to anyone who has a better understanding or higher ability level than the learner, with respect to a particular task, process or concept. The MKO typically fulfils the role of teacher or coach. The MKO can be an older adult, but can also be a peer or younger person who has a superior knowledge base about the task at hand.
3. The “zone of proximal development” (ZPD) is the distance between the learner’s ability to perform a task under guidance and collaboration and his or her ability to perform the task or solve the problem independently. Vygotsky believed that learning occurs within this zone.

Vygotsky focused on the connections between people and the sociocultural context in which shared experiences occur. He postulated that people use tools that develop from culture (speech, writing) to mediate their social environments. Children, for example, initially use these tools to express their needs; but Vygotsky argued that internalisation of these leads to higher thinking skills (Rogoff, 1990). A significant number of research studies into child development have amassed support for a “Vygotskyan social-interactionist developmental framework” (Ylvisaker & Feeney, 1998a, p. 12). Through social interactions with adults, children gradually develop higher cognitive functions by internalising the scripts and tools of culture. Over time, children become more proficient in selecting the appropriate script or choosing the correct tool, thereby requiring less and less cuing and support from adults (Ylvisaker & Feeney, 1998a). Ylvisaker and Feeney (p. 14) argued that in the same way, development of EFs and self-regulatory processes can “be understood as gradual internalizations of interaction routines”.

Vygotsky’s socio-cognitive framework undoubtedly influenced contemporary paediatric TBI rehabilitation practices, primarily through the championing of Dr Mark Ylvisaker, Dr Tim Feeney and colleagues. It
certainly influenced rehabilitation practices in Australia, where many centres attempted to adopt a context-sensitive approach to TBI rehabilitation. Within the literature that focused on approaches to paediatric and adolescent rehabilitation, a Vygotskyan framework was often directly stated as an underpinning influence (Ylvisaker & Feeney, 2009), or indirectly described through the encouragement to consider an “ecological approach” to rehabilitation (V. Anderson & Catroppa, 2006). The context-sensitive approach to rehabilitation acknowledges the interconnectedness of cognitive functioning and context, and practitioner understanding of this; an interconnectedness stemming from the work of Vygotsky (Rogoff, 1990; Ylvisaker, 2003).

2.2.4 Context-sensitive cognitive rehabilitation

Vygotskyan theory forms the theoretical basis of the contextualised paradigm in cognitive rehabilitation. Unlike the compartmentalised and decontextualised approach encouraged under the traditional model, a contextualised or context-sensitive approach uses appropriately trained communication partners as the primary agents in cognitive rehabilitation (Ylvisaker & Szekeres, 1998). The basis of contextualised rehabilitation is embedding intervention in functional, everyday routines, and it uses everyday people (e.g. parents and teachers) to help the person with TBI to develop mastery of these routines. Using an apprenticeship approach (discussed subsequently) the MKO (e.g. adult, experienced peer, teacher) supports or scaffolds the child’s participation in the interaction so that the child experiences incremental growth in cognitive performance “in
specifically targeted areas, using as the context the everyday activities and interaction” (Ylvisaker & Szekeres, 1998, p. 152).

In keeping with Vygotsky’s theory, the MKO is charged with the task of engaging the child in tasks that are within the ZPD. Through the application of dynamic assessment, a set of procedures used to determine what the child can do if aided and the most relevant type of aid required, the child is appropriately supported to operate at his or her optimal level (Ylvisaker & Szekeres, 1998). Within context-sensitive intervention, carefully designed supports, which are systematically faded, are used as the person with TBI acquires and internalises routinised strategic behaviours (Ylvisaker, 2003). The goal is to organise daily routines of home, school, work and other community environments, to facilitate the child’s successful participation in these contexts. Through supported participation in these environments the child internalises the well-rehearsed behaviours and strategies, facilitating cognitive processes; ultimately, the child experiences success and enhanced self-esteem (Ylvisaker et al., 2005). Building cognitive skills through “well-conceived and systematically faded social supports [is] precisely the process of normal cognitive development described by Vygotsky” (Ylvisaker, 2003, p. 7).

2.2.4.1 Apprenticeship approach

Scaffolding a child’s learning was not a new concept within developmental cognitive psychology, and within the adolescent and adult literature it has been typical of vocational training and an apprenticeship mode of instruction (Ylvisaker, 2003; Ylvisaker & Feeney, 1998a). Bruner,
responsible for coining the metaphor of scaffolding (Ylvisaker, 2003), and Rogoff, were two cognitive psychologists involved in the “Vygotsky renaissance” (Ylvisaker & Feeney, 1998a, p. 16), both advocating the use of guided participation as an effective way of helping children acquire knowledge and skills (Rogoff, 1990; Ylvisaker, 2003; Ylvisaker & Feeney, 1998a). Through collaborative efforts between the child and the MKO, or as Ylvisaker and Feeney conceptualised it, apprentice and master craftsperson, a person with TBI is able to internalise scripts and strategies that support successful behaviours, and to progress toward more independent action as such behaviours become automatised and effortless (Ylvisaker, Jacobs, & Feeney, 2003).

Rogoff’s (1990) theory of cognitive development asserted that children, who are “apprentices in thinking” (p. 7), require both guidance and participation in culturally valued activities to develop their cognitive skills and higher order processes. Within an apprenticeship approach to cognitive rehabilitation, adolescents achieve a shared understanding with those who serve as their mentors through “explanation, discussion, provision of expert models, joint participation, active observation and arrangement of roles” (Rogoff, 1990, p. 6). The core elements of an apprenticeship approach have been described by Ylvisaker and Feeney in various publications (Ylvisaker, 2003; Ylvisaker & Feeney, 1998a; Ylvisaker & Feeney, 2009) and are presented in Figure 2.1.
Figure 2.1: Features of an Apprenticeship Model

- The behaviour or skill being learned is taught in a setting in which it occurs naturally.
- The activity is authentic and has a meaningful goal for the learner.
- The focus is on collaborative completion of the task rather than the learner’s performance.
- Completion of task is social not solo.
- The collaborator is available whenever the learner cannot successfully complete the task, thus ensuring success for the learner.
- The teacher engages the learner in a task through guided observation.
- The task is functional, meaningful, goal-oriented and completed in a collaborative manner.
- As the learner becomes able to complete more components of the task, the teacher does not completely withdraw support, but rather continues to coach the learner (brainstorm, model, provide feedback and encouragement) and collaborates as the learner acquires more components of the task.
- As the learner improves, support is systematically withdrawn or the task is made more difficult, or both.

(Adapted from Ylvisaker & Feeney (1998a) and Ylvisaker & Feeney (2009))

Hartley (1995) explained that the ecological or social validity of traditional approaches to rehabilitation becomes questionable once skills are viewed in natural contexts. Using the work of Malkmus (1989) and Valletutti and Drummett (1992), Hartley identified how rehabilitation that occurs in a natural environment can be viewed as a philosophy of rehabilitation, an intervention strategy and as a guide to the content of intervention. As a philosophy it encompasses the value of real-life roles and responsibilities. It emphasises the development of social competence. As an intervention strategy it employs a top-down approach, identifying typical roles the person must fulfil. The competencies needed for these roles are then the target or content of intervention. This means that skills must be taught through actual experience and practised in natural contexts wherever possible. As such, context-sensitive rehabilitation is reliant on the integrated work of a multidisciplinary rehabilitation team working in a functional and collaborative approach to rehabilitation (Ylvisaker et al.,
2005). As has been illustrated in this section, through collaborating with everyday people in the child’s life, rehabilitation clinicians can ensure that the people surrounding the child have the necessary knowledge and competencies to provide ongoing support and successfully facilitate the child’s recovery and development (Ylvisaker & Feeney, 1998b).

2.2.4.2 The challenge of serving children and adolescents with TBI

The contextualised paradigm necessitated a shift in thinking for many TBI rehabilitation clinicians. Although many paediatric rehabilitation clinicians were well versed in developmental theories and analysing children’s performance through a developmental framework, scaffolding children’s activities so as to incrementally increase their everyday functioning in everyday contexts remained a challenge, as training models in many health fields posited clinicians in an expert role. Under the medical model, the onus was on rehabilitation professionals to focus on the underlying impairment and apply their specialist skill and knowledge in order to ameliorate the impairment. This model afforded much power and control to the expert professional. Under a context-sensitive model, one that adopts an apprenticeship approach to facilitate executive functioning behaviours, the onus is on the rehabilitation professional to collaborate with other team members, often the people who interact with the child in everyday contexts, and to share their ideas, knowledge and skills willingly. The challenge for many clinicians who move from a medical model to the context-sensitive model is to overcome the sense that they are handing over their expert role and divesting themselves of the power and control to which they are accustomed with regard to decision making. Using a
strengths-based approach to rehabilitation and adopting the metaphor of mentor-student, master craftsperson-apprentice, or even coach-athlete, is one way of allowing rehabilitation professionals to reconsider their role in rehabilitation and to support the person with TBI to experience incremental skill development, gradual acquisition of autonomy, and heightened self-confidence and responsibility for self (Ylvisaker & Feeney, 1998b).

The paradigmatic shift in paediatric TBI rehabilitation was necessary, not only because of the realisation that the traditional medical model failed to effect sustainable, generalised skill improvements for people with TBI, but also because of the realisation that children and adolescents with TBI require rehabilitation services and approaches that are different from those offered to adults with TBI (Galvin & Mandalis, 2009). In introductory comments to an issue of the journal Developmental Neurorehabilitation, Anderson and Ylvisaker (2009) noted the increasing awareness that “injuries to the developing brain cannot necessarily be understood or treated in the same manner as those occurring in adulthood” (p. 253). They observed that although the field of paediatric and adolescent TBI rehabilitation can be guided by adult models and approaches to rehabilitation, “there are unique developmental and contextual issues that need to be taken into account at all stages of recovery and treatment in children” (p. 253). Therein lies another challenge to the developing fields of paediatric and adolescent TBI rehabilitation: the development and rigorous evaluation of models of paediatric TBI rehabilitation.
Catroppa and Anderson (2009) provided an up-to-date view of the state of paediatric TBI rehabilitation, noting that while much descriptive research had established the acute and long-term outcomes of paediatric TBI, research into the efficacy of paediatric rehabilitation intervention remained minimal. They called for research of an interdisciplinary nature to develop and evaluate rehabilitation programmes specific to children and adolescents, and for such research to include collaboration with families and carers so that functional measures were held paramount. Catroppa and Anderson asserted that such an approach was better tailored to the developmental needs of children and adolescents and better met the practical needs of the family. Like several other researchers in the field, they acknowledged the developmental, methodological, and ethical issues that impeded research with a paediatric population (e.g. ethical restrictions of certain study designs, developmental variations and recovery patterns in children, heterogeneity of sample, siloed research efforts) (V. Anderson & Yeates, 2007; C. Hughes & Graham, 2002; Laatsch et al., 2007). However, there was now a well acknowledged need for the advancement of a developmentally specific response to injury and subsequent rehabilitation programmes (V. Anderson & Yeates, 2007) and this raised at least two challenges for rehabilitation clinicians and researchers: it created the need for clinicians to possess knowledge of normal child development coupled with injury-specific variables, outcomes, and patterns of recovery, so that the design and implementation of rehabilitation programmes were optimally timed and, from a functional perspective, reflected the developmental stage of the individual child; it was also necessary for
researchers to embark on novel and collaborative research efforts that could be translated into developmentally appropriate models, guidelines, and frameworks for practice (V. Anderson & Catroppa, 2006; V. Anderson & Yeates, 2007).

In response to the need to understand the implications of developmental factors on rehabilitation, the primary psychosocial and cognitive features of adolescence, as well as developmental models that have been used to inform this study, are now reviewed.

2.3 Adolescence

Adolescence is considered to be a critical developmental stage, characterised by well-documented growth and changes in physical, social and cognitive domains (P. H. Hawley, 2011). Throughout time, the demands, pressures, and expectations of adolescence have been well noted. Hawley (2011) postulated that “a number of our physical and psychological vulnerabilities find their source in a ‘mismatch’ between our biological and psychological adaptations and modern environments”. She described the current scourges of adolescent obesity and diabetes as attributable to our need no longer to expend energy to gather food, our ready access to pre-prepared foods, and our tendency for a sedentary lifestyle. This mismatch had led to a plethora of illnesses and diseases not previously typical of adolescence. Hawley highlighted the factors that currently impact on adolescents’ development, such as reduction in the time spent with immediate family (both parents working), computer-based entertainment, loss of sleep, and limited time spent outdoors.
Simultaneously, the conditions of modern living mean that adolescents are achieving puberty earlier, creating a gap between psychosocial and reproductive maturity. A number of researchers have investigated factors influencing early onset risk behaviours in adolescents (e.g. smoking, alcohol consumption, sexual activity, school refusal), and evolutionary psychologists believe that the mismatch between biological, psychological and environmental adaptation is at the root of maladaptive behaviours in adolescents (Bond et al., 2007; Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; P. H. Hawley, 2011; Lohman, Kaura, & Newman, 2007; McKinney, Donnelly, & Renk, 2008).

This chasm is referred to as the “maturity gap”, a time when adolescents are “chronological hostages of a time warp between biological age and social age” (Moffitt, 1993, p. 687), and it is of particular significance when exacerbated by the neurobehavioural and cognitive sequelae of TBI. Rather than presenting an exhaustive discussion of adolescence and the myriad of developmental and maturational changes that occur during this life stage, this review focuses on the neurological and cognitive developments that occur, and the importance to adolescence of the development of identity and sense of self.

2.3.1 Cognitive development in adolescence

Like other areas of human development, cerebral development occurs in a discontinuous manner characterised by spurts and plateaus (Hudspeth & Pribram, 1990). Correspondingly, EF development has also been shown to follow a protracted pathway, with many abilities, such as problem
solving and reasoning skills, continuing to develop through adolescence (Luna, Garver, Urban, Lazar, & Sweeney, 2004). Executive functions are thought to be primarily mediated by the anterior regions of the brain, with connections between the prefrontal cortex and all other areas of the brain exhibiting neurophysiological development into adulthood (P. Anderson, 2002; V. Anderson, Anderson, Northam, Jacobs, & Catroppa, 2001; Hudspeth & Pribram, 1990). Functional improvement in executive processes is aligned with this sporadic neurophysiological maturation (P. Anderson, 2002), with different executive processes maturing at different ages, resulting in variable development trajectories (P. Anderson, 2002; V. Anderson et al., 2001; Hudspeth & Pribram, 1990; Luna et al., 2004; Stuss & Anderson, 2004).

Using data collected through electroencephalogram (EEG) studies, Hudspeth and Pribram (1990) described a detailed pattern of neurophysiological maturation across the first 21 years of life. They concluded that there are five cycles of brain maturation across the developmental stages of infancy, childhood, adolescence and early adulthood, and that the temporal sequence of maturation is consistent with stages of cognitive development. They divided the brain into four regions (parieto-occipital, temporo-temporal, centro-central and fronto-temporal) and showed that maturation patterns across the first decade of life were synchronised across all four regions, but variations in the onset and offsets of change emerged with the onset of puberty. Through adolescence the temporal, central and frontal regions of the brain
recorded rapid, sporadic change. Between the ages of 18 and 21 years, the changes recorded were exclusively within the frontal region, indicating that “postpubertal maturation proceeds from the posterior to the frontal regions of the brain” (Hudspeth & Pribram, 1990, p. 882). Maturation involves myelination of nerve fibres as well as the associated processes of synaptogenesis and synaptic pruning (Blakemore & Choudhury, 2006). These physiological process result in more rapid transmission of nerve impulses, making more efficient processing one feature of adolescent cognitive development (V. Anderson et al., 2001).

The continual structural changes to the prefrontal and parietal cortices during adolescence affect the capacity and efficiency of a number of cognitive skills (e.g. selective attention, decision making, response inhibition, and working memory). Blakemore and Choudhury (2006) summarised the literature focusing on behavioural studies of adolescent cognitive development. They found that adolescent performance on tasks of inhibitory control, processing speed, working memory, problem solving and decision making continued to improve across adolescence. Blakemore and Choudhury referred to a study by MacKinlay, Charman and Karmiloff-Smith (2003) on prospective memory in children between 6 and 14 years, and in an adult cohort. Mackinlay et al. used multitasking to assess prospective memory across cohorts. Participant responses were scored for both efficiency and use of strategies. Results showed a significant improvement in both measures between the ages of 6 and 10 years, but no significant change between the ages of 10 and 14 years. Yet adult
participants significantly outperformed the children in the study. Mackinlay et al. concluded that this gap in efficiency and strategy use was indicative of ongoing development of prospective memory through adolescence, in line with frontal lobe maturation.

Anderson et al. (2001) used a normative sample of 138 Australian adolescents aged 11;0 years to 17;11 years to map the development of EF skills from late childhood through early adolescence. The cohort was divided into six age groups, with approximately equal number of girls and boys in each group. All participants spoke English as their first language and there was no record of sensory deficit, brain damage, neurological abnormality or developmental disability. The assessment battery included a variety of tests that tapped attentional control, cognitive flexibility, and goal setting. The Wechsler Intelligence Scale for Children (3rd edition) was also administered. Across the age range studied, the greatest progress was seen in attentional control and processing speed. Some improvement was observed in goal setting skills across adolescence. Processing speed demonstrated a developmental spurt at about 15 years of age and goal setting skills exhibited a developmental spurt at around 12 years of age. These findings were consistent with the known neurophysiological development of early adolescence, including the ongoing process of myelination until about 15 years of age, and support the notion that older adolescents “have a greater attentional capacity and complete tasks faster than their younger counterparts” (V. Anderson et al., 2001, p. 403).
Adolescents have a capacity to hold in mind more multidimensional constructs, making their thinking more strategic (Blakemore & Choudhury, 2006). Some skills, such as goal setting, cognitive flexibility and planning skills, are relatively stable by 12 years of age. Other aspects of EF, like attentional control and processing speed, have a steady progression until about 9 years of age, with developmental spurts in mid-adolescence (P. Anderson, 2002; V. Anderson et al., 2001; Catroppa & Anderson, 2006). As the neural circuitry associated with the frontal regions and associated subcortical loops develop, adolescents exhibit improved decision making and response inhibition skills, as well as an ability to carry out several tasks simultaneously (Blakemore & Choudhury, 2006; Hudspeth & Pribram, 1990).

One of the challenges facing paediatric cognitive researchers and clinicians alike is that developmental research has been guided by adult models of frontal lobe functioning rather than being based on theories with a developmental framework (V. Anderson & Ylvisaker, 2009; Brocki & Bohlin, 2004). To develop clinical programmes that meet individual children’s and adolescents’ needs, clinicians require accurate understanding of normal cognitive development. This would allow deviation from typical developmental patterns to be detected earlier, assisting with diagnostic outcomes and ensuring that intervention programmes are tailored to specific needs (P. Anderson, 2002).
Adolescence is a period of great change, not only in cognitive flexibility but also in identity and development of self-awareness (Blakemore & Choudhury, 2006). The development of theory of mind, defined as the ability to use personal experiences of mental states, beliefs and attitudes to understand the mental state of others, is another hallmark feature of adolescence (Blakemore & Choudhury, 2006; Stuss & Anderson, 2004). Theory of mind has been linked with the development of EF, such as inhibitory control, cognitive flexibility, reasoning, and working memory (Stuss & Anderson, 2004). This abstract level of self-awareness requires the ability to self-reflect and use metacognition to interpret social situations from a variety of perspectives. The combination of neural and hormonal changes occurring during adolescence is a likely influence on the development of such social cognitive abilities (Blakemore & Choudhury, 2006). It is further postulated that the development of social cognition through adolescence occurs via two-way interaction between such physiological development and the expanding and different social experiences and priorities of adolescence (Blakemore & Choudhury, 2006). As adolescents begin to experience greater independence and accumulate new social experiences, their cognitive skills and the neural pathways that underpin them are affected. Thus, in considering adolescent development, cognitive as well as psychological development, and in particular, the development of self and identity, must be taken into account.
2.3.2 Identity development in adolescence

The study of self and identity has been a long-standing pursuit of psychological researchers (Schwartz, 2008). Like cognitive development, identity development is thought to proceed at different rates in different contexts (Fadjukoff, Kokko, & Pulkkinen, 2007). Researchers have suggested that, due to changing social structures as the Western world moved from the industrialised to the late modern age, a delay in the transition to adult roles and identities occurred as the number of lifestyle options available to young people increased (Arnett, 2004; Fadjukoff et al., 2007). Arnett (2004) described the period between 18 years of age and the late 20s as emerging adulthood, and postulated that while the delay in assuming full adulthood allowed heightened opportunities for self-exploration, cultural changes had concurrently made more demanding the development of a sense of identity (Arnett, 2004; Fadjukoff et al., 2007). Nevertheless, prior to assuming full adulthood, adolescents move through a series of identity development phases.

Perhaps the best known work in relation to identity development is that of Erik Erikson in the 1960s. Erikson proposed that identity formation occurs as a person moves through cycles of identity crisis to commitment. Erikson described two outcomes of identity formation (identity achieved vs. diffused) that essentially translate to two practical outcomes: either a personal commitment to a consistent identity or a confused and disorganised state with little exploration to resolve this status (Kumru & Thompson, 2003). Erikson believed that identity development was a lifelong process, with individuals altering and adapting their identity in
response to environments, experiences and expectations (Faircloth, 2009). He suggested that adolescence and young adulthood are particularly crucial developmental periods which commence the process of identity integration (Faircloth, 2009). It is during these periods that self-descriptions become increasingly multifaceted and complex, with changes in the content of self-descriptions also occurring through to early adulthood (Pasupathi & Hoyt, 2009). Hence, “the ability to detect contradictions emerges by mid-adolescence, but the capacity for resolving them is a phenomenon of later adolescence” (Pasupathi & Hoyt, 2009, p. 558). This observation is in keeping with adolescents’ increasing cognitive and epistemic abilities concurrently developing at these life stages (Pasupathi & Hoyt, 2009).

It was James Marcia’s operationalisation of Erikson’s work that sparked a productive period of research into adolescent identity development during the 1980s and 1990s (Faircloth, 2009; Kumru & Thompson, 2003). Marcia (1980) proposed four states of identity development during adolescence, which are influenced by the environment, experience and individual interests: diffusion, foreclosure, moratorium and achievement. Marcia (1980) described each of these states in terms of their position on two complementary dimensions: exploration and commitment. Table 2.1 maps each state and its position with regard to these dimensions. In Marcia’s paradigm, diffusion status is characterised by lack of commitment to features of a desired identity and is the least sophisticated status; however, he did not consider it to be an
unresolvable status. Achievement status is characterised by behaviours that show deliberate decision making with regard to occupation and lifestyle, and it is the most mature and developmentally sophisticated status (Fadjukoff et al., 2007).

Table 2.1: Marcia's identity statuses

<table>
<thead>
<tr>
<th>Status</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffusion</td>
<td>Confused and disorganised; little exploration of identities occurring; no active identity formation occurring.</td>
</tr>
<tr>
<td>Foreclosure</td>
<td>Commitments made without an exploratory phase; no identity crises experienced, identity typically formed via identification with parents or other authority figure.</td>
</tr>
<tr>
<td>Moratorium</td>
<td>Characterised by exploration of alternative identities but no commitment.</td>
</tr>
<tr>
<td>Achievement</td>
<td>Commitment made following phases of crises or exploration; deliberate decisions made with regard to occupation, lifestyle and family roles.</td>
</tr>
</tbody>
</table>

(Adapted from Fadjukoff et al., 2007; Kumru & Thompson, 2003; Marcia, 1980)

According to Faircloth (2009, p. 325), a “premier developmental task” of adolescence is developing a well-integrated identity across time and context so as to achieve a sense of “personal sameness”, a presence of consistency in self regardless of the context. It has also been suggested that the purpose of identity construction is to allow people to have a story that allows them to “fit in” and “be part of the story” (Faircloth, 2009; Holland, Lachicotte, Skinner, & Cain, 1998). Consequently, the relationship between identity development and belonging and connectedness in the lives of adolescents has been widely researched across the health, social science and education fields (Barber & Schluterman, 2008). Building on the research into identity development in the 1980s and 1990s, investigations of how adolescents fit with their environments, and how the environments
in which they are situated influence development, proliferated throughout the 1990s and early 2000s (Waters, Cross, & Runions, 2009). Social researchers began to realise that adolescent development, including identity construction, was regulated by the multiple social contexts in which it was embedded (Lohman et al., 2007). Resnick et al. (1993, p. S4) explained that “an understanding of adolescents’ social relationships and feelings of connections to others as they experience and live the developmental changes of their physical, social and psychological selves” was required in order to develop theories and models that promote positive adolescent health and development.

The findings of several longitudinal studies, such as the National Longitudinal Study of Adolescent Health (Add Health) (McNeely, Nonnemaker, & Blum, 2002), the Cross National Adolescence Project (C-NAP) (Barber, Stolz, Olsen, Collins, & Burchinal, 2005), and two studies from the Social Development Research Group (Seattle Social Development Project and Raising Healthy Children) (Catalano et al., 2004) consistently reported that connectedness is a protective function in adolescent development (Barber & Schluterman, 2008; Catalano et al., 2004; Fredricks, Blumenfeld, & Paris, 2004; Heaven & Newbury, 2004; Ozer, Wolf, & Kong, 2008; Resnick et al., 1993). The work of the Social Development Research Group, in particular, which has been guided by the social development model (Catalano & Hawkins, 1996), has resulted in the development of interventions that aim to “reduce risk factors and increase protective factors for adolescent health and behaviour problems”
(Catalano et al., 2004, p. 252). The SDM, a “theoretical framework that explains how protective factors work together to reduce risk” in the lives of adolescents (Catalano, Hill, Haggerty, Fleming, & Hawkins, 2010), is presented in the following section. The SDM draws on control theory and attachment theory to describe the central role of connectedness in adolescent development.

### 2.4 Social development model

The Social Development Research Group (SDRG), led by Richard Catalano and David Hawkins, investigated risk and protective factors for adolescent development, as well as promotive and preventive interventions that address these factors. Their model of adolescent psychosocial development, the SDM, is the result of over 30 years of work. The SDM was originally conceived as a theory of antisocial behaviour. It “organised the results of research on risk and protective factors [...] into hypotheses regarding the development of antisocial and pro-social behaviour” in adolescents (Catalano & Hawkins, 1996, p. 149). The SDM is based on social learning theories and the assertion that a core process that influences adolescents’ behaviours, choices and actions is the connection or bond they establish with others within their social environments, and the behaviours, norms and values of those to whom the individual is bonded (Catalano & Hawkins, 1996).

Connectedness, a sense of belonging, and the opportunity to explore and commit to a social identity that allows a young person to develop strengths within a value system of a defined group, are considered to be
necessary components of adolescent development (Barber & Schluterman, 2008; Catalano & Hawkins, 1996; Resnick et al., 1993; Ylvisaker & Feeney, 1998c). Catalano and Hawkins (1996) used the term bond rather than connection within the SDM. The SDM used the principles of control theory (Hirschi, 1969) to define its conceptualisation of bond (Catalano et al., 2004). Within SDM, bonds are considered to consist of two elements: (1) attachment, characterised by close, affective relationships; and (2) commitment, exemplified by an individual’s investment in a line of action. The combination of these elements means that once a bond is established it influences an individual’s behaviour choices by evaluating the costs and benefits to the bond of any particular behaviour compared to the individual’s self-interest. “If individuals engage in behaviour that is inconsistent with the standards and norms of those to whom they are bonded, the bond may be threatened if the behaviour is exposed” (Catalano & Hawkins, 1996, p. 157).

In describing the SDM, Catalano and Hawkins postulated that behaviour would be pro-social or antisocial, depending on the “predominant behaviours, norms and values held by those to whom the individual [is] bonded” (Catalano & Hawkins, 1996, p. 157). Bonds can develop with family, peers, educators, employers and other influential non-parental adults. For adolescents in particular, the “socialising units” that an individual associates with, and the individual’s bond with that group or person, have the potential to influence that adolescent’s pathway in life (Catalano & Hawkins, 1996).
Catalano and Hawkins (1996, p. 155) stated that the model is a “synthesis of control theory, social learning theory, and differential association theory”. Control theory (e.g. Hirschi, 1969) is used to “identify causal elements [...] in the etiology of delinquency, as well as in the etiology of conforming behaviour” (Catalano & Hawkins, 1996, p. 155); social learning theory (e.g.: Bandura, 1986) is used “to identify processes by which patterns of conforming and antisocial behaviours [are] maintained or extinguished” (Catalano & Hawkins, 1996, p. 155); and differential association theory is used to “identify parallel but separate causal paths for pro-social and antisocial processes” (Catalano & Hawkins, 1996, p. 155). Catalano and Hawkins hypothesised that “underlying socialisation follows the same processes of social learning whether it produces pro-social or problem behaviour” (p. 156).

The SDM is based on the assumption that a “normative consensus exists in society to the extent that everyone ‘knows the rules of the game’” (Catalano & Hawkins, 1996, p. 156). The authors also note that there is “variation in the strength and content of both pro-social and antisocial motives, beliefs, and justifications” (p. 156) that influence people’s adherence to the rules. Such variations give rise to pro-social or antisocial behaviours. Within the SDM there is acknowledgement of the existence of room for agreement about society’s basic rules and room for variation in the strength of normative beliefs.
On the basis of these theories and assumptions, it is asserted in the SDM that children and adolescents learn social rules through repeated socialising processes. “When these socialising processes [are] consistent, a social bond develops between the individual and the socialising unit” (Catalano & Hawkins, 1996, p. 156). When socialising processes are strongly established, they have the power to control behaviour via an individual’s desire to conform to the values and norms of the socialising unit. Catalano and Hawkins (1996) explained that developing children and adolescents are exposed to both pro- and antisocial influences, and acknowledgement of the existence of both these encounters better reflects the reality of social development. They described the four constructs of the SDM that contribute to socialising processes:

- The perceived opportunity for involvement in activities and interactions
- The degree of involvement and interaction
- The skills to participate in these involvements and interactions
- The reinforcement perceived as forthcoming from performance in activities and interactions.

Within the SDM it is posited that children and adolescents learn social rules. They also develop social bonds and behaviours for involvement in environments for which they perceive they have the necessary skills or would be supported to develop the necessary skills. The perceived reinforcement from adolescents’ involvement in such opportunities, be it
positive or negative, strengthens or weakens adolescents’ bonds with the
social environment and social circle. The authors of the SDM hypothesised
that when adolescents have opportunities for involvement in pro-social
environments which offer activities and interactions that meet or build
their skill level, and environments that offer pro-social feedback, they
develop healthy social beliefs and have clear standards for acceptable
behaviour, resulting in the development of healthy, pro-social behaviour.

Over the course of developing and refining the SDM, the SDRG
condensed the aforementioned four processes into three, but
acknowledged that individual traits and characteristics (such as arousal
level, cognitive skills and position within the social structure) influence
adolescents’ ability to perceive opportunities for involvement, develop the
skills that maintain involvement, and perceive the rewards from their
involvement with groups and group activities. The most recent version of
the SDM (Social Development Research Group, 2009) no longer refers to
both pro- and antisocial pathways but rather, through the adoption of a
strengths-based approach to adolescent development, depicts the three
constructs needed to produce a positive social bond and progress to
developing healthy beliefs, standards and social behaviours:

- Opportunities for involvement in productive, pro-social roles
- The requisite skills to be successfully involved in these roles
- Consistent recognition and reinforcement for involvement in the socialising unit.

(Catalano & Hawkins, 1996; Social Development Research Group, 2009)

Catalano and Hawkins (1996, p. 163) hypothesised that it is critical that adolescents perceive opportunities for involvement in the social milieu. They wrote, “it is not sufficient to engage individuals, for they must know the opportunity is available and [...] satisfies their personal interests”. In the absence of this self-perceived knowledge, the opportunity for involvement does not influence behaviour. Opportunities for involvement precede the formation of attachments and commitment to the socialising unit.

An adolescent’s skill base is another construct identified as facilitating pro-social development. Cognitive, emotional and behavioural skills, in particular, are identified in the SDM as having particular influence on an adolescents’ ability to benefit from the social context in which they are situated. Abilities to express and manage feelings, control impulses, read social cues, problem-solve and make decisions, understand behavioural norms, and actually perform tasks all increase the likelihood of experiencing rewards for pro-social involvement and interaction. Essentially, people’s ability to be involved and interact within a social context affects the level of reinforcement they perceive. Furthermore, if attachment and commitment are dependent on the level of reinforcement received, then factors that “enhance reinforcement and perception of
reinforcement should indirectly affect the development of attachment and commitment” (Catalano & Hawkins, 1996, p. 164). Consequently, the degree to which pro-social involvements and interactions are positively reinforced also determines the formation of a bond with a social group and the development of pro-social behaviours.

The SDM, which has evolved through the research efforts of the SDRG, is reproduced in Figure 2.2 (Catalano et al., 2004; Social Development Research Group, 2009).

Figure 2.2: The Social Development Model
(Reproduced with permission from http://www.sdrg.org/projects.asp)

Another widely researched topic of adolescence is motivation and engagement. This is due partly to the general belief that such behaviours are difficult to produce in adolescence, partly due to the desire improve
and broaden understanding of what motivates and engages adolescents, and partly to efforts to ascertain how to motivate and engage adolescents with regard to schooling and education (Appleton, Christenson, & Furlong, 2008; Deci, Eghrari, Patrick, & Leone, 1994; Dube & Orpinas, 2009; Eschenfelder, 2005; Fredricks et al., 2004; J. Heckhausen, Wrosch, & Schulz, 2010; Holt, Bry, & Johnson, 2008; Maslow, 1987; McNeely et al., 2002; Morgan, 2006; National Research Council & Institute of Medicine, 2004; Saks, 2006; E. A. Skinner, Wellborn, & Connell, 1990b). Self-determination theory (Ryan & Deci, 2000b), a model focusing on human motivation and the states of motivation experienced by humans, is explained in the following section.

2.5 Self-determination theory

Self-determination theory is a theory of human motivation in which different types of motivation are distinguished “based on the different reasons or actions that gave rise to a goal” (Ryan & Deci, 2000a, p. 55). An assumption underpinning SDT is that social-contextual factors, such as feedback and rewards for effort, facilitate feelings of competence which translate to increased intrinsic motivation (Ryan & Deci, 2000a). Intrinsic motivation is considered a critical element in the cognitive, social and physical development, because it is through “acting through one’s inherent interests that one [grows] in knowledge and skills” (Ryan & Deci, 2000a, p. 56).

At a broad level, SDT distinguishes between intrinsic motivation and extrinsic motivation. Whereas intrinsic motivation is generated by the
simple enjoyment of the activity itself, extrinsic motivation is often
generated and controlled by an external force. It is postulated that
internalisation and integration of values and behavioural regulations of
others moves a person closer to more autonomous control of extrinsically
motivated actions. Internalisation is defined as the process of taking in a
value or regulation, and integration is defined as the process by which
“individuals more fully transform the regulation into their own so that it
will emanate from their sense of self” (Ryan & Deci, 2000a p. 60).
Internalisation occurs along a continuum, on which behaviour ranges from
amotivation through active compliance to personal commitment. Ryan and
Deci (2000b) concluded that increasing levels of internalisation, and thus
personal commitment, feed greater persistence, more positive self-
perceptions, and an increased quality of engagement. This concept aligns
with that of bond proposed in the SDM, where bond refers to a person’s
behaviour and choices being regulated by the values and actions of the
socialising unit and by a person’s attachment and commitment to that unit.

Ryan and Deci (2000a) observed that it is important for educators to
understand the different types of extrinsic motivation and how to
engender each of them in students. It could, therefore, be an equally
important issue for rehabilitation clinicians, with all related professions
invested in creating effective learning environments. Again, Ryan and Deci
observed that “many of the tasks educators want their students to perform
are not inherently interesting or enjoyable […] knowing how to promote
more active and volitional (versus passive and controlling) forms of
extrinsic motivation becomes an essential strategy for successful teaching” (2000a, p. 56). They further detailed how motivation existed in the “nexus between a person and a task”. They explained that, influenced by two behavioural theories that dominated the research scene in the 1940s to 1960s, operant theory (B. F. Skinner, 1953) and learning theory (Hull, 1943), research into motivation focused on both the task characteristics that made an activity interesting as well as the basic psychological needs that were satisfied by motivated behaviours. Ryan and Deci’s work, and thus the SDT, focused more on the psychological needs met by motivated behaviour. They proposed that the psychological needs of competence, autonomy, and relatedness are propellants of motivated behaviour. When met, these psychological needs yield “enhanced self-motivation and mental health and when thwarted lead to diminished motivation and well-being” (Ryan & Deci, 2000b, p. 68).

A sense of competence is enhanced when the social context provides an activity that is optimally challenging for a person and when feedback and rewards stem from participating in that activity. Competence is enhanced when feedback is “effectance promoting [...] and free from demeaning evaluations” (Ryan & Deci, 2000a). Ryan and Deci (2000b) also noted that a sense of competence did not enhance a person’s intrinsic motivation unless accompanied by a sense of autonomy. In the SDT, people must “not only experience competence or efficacy, they must also experience their behaviour as self-determined” (Ryan & Deci, 2000b, p. 68). Choice and opportunities for self-direction are listed in the SDT as
activators of intrinsic motivation, with contexts supportive of autonomy promoting curiosity and a desire for challenge (Ryan & Deci, 2000b).

Ryan and Deci (2000b) also hypothesised that motivation flourishes in contexts that offer a sense of security and relatedness. Ryan and Deci (2000a) asserted that extrinsic motivation was enhanced by a desire to feel connected to another person, group, or society. The originators of SDT hypothesised that a strong relational bond with another person or group regulated behaviour through the adoption and internalisation of a common goal, value or belief. Wanting to feel connected motivates people to act in a manner that strengthens the relational bond (Ryan & Deci, 2000a). In describing SDT, Ryan and Deci (2000b) cited a number of studies that have demonstrated the impact of competence, autonomy and relatedness on both intrinsic and extrinsic motivation (for example: Connell & Wellborn, 1991; Deci et al., 1994; Ryan, 1995). They concluded that these three psychological needs “appear to be essential for facilitating optimal functioning of the natural propensities for growth and integration, as well as for constructive social development and personal well-being” (Ryan & Deci, 2000b, p. 68).

Thus in the SDT it is acknowledged that the psychological needs of competence, autonomy and relatedness are central to promoting human motivation. This line of thought is extended in the self-systems process model (SSPM; Connell & Wellborn, 1991), in which it is proposed that these three needs form the basis of self-development. Connell and Wellborn, who developed that model, used the same operational definitions for
competence, autonomy and relatedness as Ryan and Deci, but examined the relationships between these needs, context, resulting actions and outcomes. Studies by Connell, Wellborn and colleagues (for example: Connell & Wellborn, 1991; E. A. Skinner et al., 1990b) typically focused on self-development within the context of school. These authors reiterated the critical need for competence, autonomy and relatedness to be satisfied in adolescence in order to positively affect motivation, engagement, well-being and self-development. Their model is now explored.

2.6 Self-systems process model

Competence, autonomy and relatedness were described by Connell and Wellborn (1991) as the three psychological needs of adolescence. When met, these needs lead to motivated and engaged behaviour, heightened ability to perceive opportunities for interaction and involvement, and a perception of being rewarded. The notions of Connell and his colleagues (Connell & Wellborn, 1991; E. A. Skinner et al., 1990b) strongly associate their psychological model of self with the SDM, SDT, and with the context-sensitive approach to cognitive rehabilitation, especially the apprenticeship model described in section 2.2.4.1.

The SSPM (Connell & Wellborn, 1991) accounts for people’s personal views of themselves and the impact of these views on their interactions and actions within a set context. Within the model, the self-system is considered to be a set of appraisal processes “whereby the individual evaluate[s] his or her status” within a context with respect to the three fundamental psychological needs (Connell & Wellborn, 1991, p. 51).
Development of self occurs as people seek experiences that fulfil their needs of competence, autonomy and relatedness and then appraise how competent, autonomous and related they feel with respect to a particular context (Connell & Wellborn, 1991). “These appraisal processes [are] referred to as self-system processes” (Connell & Wellborn, 1991, p. 52).

According to Connell, the four defining features of the SSPM in comparison to other models of self are:

1. It is acknowledged that people have fundamental psychological needs for competence, autonomy and relatedness.
2. Self-system processes develop out of the interaction of psychological needs and social context within particular cultural enterprises.
3. Aspects of the social context most relevant to meeting these needs, and thus to the development of self-system processes, are the provision of structure, autonomy support, and involvement.
4. Inter- and intra-individual variation in self-system processes produces variability in patterns of action within cultural enterprises.

(Adapted from Connell & Wellborn, 1991, p. 51)
Underpinning the model is the assertion that linkages between aspects of context (structure, autonomy support and opportunities for involvement) and self (feelings of competence, autonomy and relatedness) produce either engaged or disengaged actions, resulting in the development, or not, of skills and abilities and an individual’s self-concept. When a particular “cultural enterprise such as family, school or work” (Connell & Wellborn, 1991, p. 52) provides the necessary contextual supports and meets a person’s psychological needs, engagement occurs. When the cultural enterprise fails to provide adequate contextual supports or meet a person’s psychological needs, disaffection results, along with adverse effects on behaviour, affect and cognition (Appleton et al., 2008; Connell & Wellborn, 1991).

Appleton et al. (2008) reviewed literature that addressed the construct of engagement within the educational setting, and suggested that a relationship existed between motivation and engagement. Appleton et al. adapted the SSPM to represent the cyclical relationship among level of engagement with contextual features. They argued that engagement was malleable, in response to interactions with contextual variables. Such “cyclic interactions with contextual variables” (Appleton et al., 2008, p. 379) served to influence later academic, behavioural and social outcomes. Appleton et al. adapted Connell and Wellborn’s (1991) original figure of the SSPM by adding an outcomes section to the model, illustrating that social contexts, which supported students’ needs for competence, autonomy and relatedness, produced engaged patterns of action that resulted in
academic, social and emotional outcomes. Figure 2.3 represents the cyclical relationships between “level of engagement, as well as the quality and quantity of support received from the context en route to expected outcomes” (Appleton et al., 2008).

Figure 2.3: Self-systems process model depicting the relationship between context, psychological needs, engagement and outcome. (Reproduced from Appleton et al. (2008) with permission)

Appleton et al. (2008) argued that understanding the elements needed to produce engaged behaviour would enable educators to modify the school environment to reduce levels of school dropout and disengagement and to improve academic, social and emotional learning outcomes for students. The SSPM resonates with the SDT and SDM, all suggesting that adolescents should have contexts that are respectful and supportive of their needs to build competence and autonomy and to expand their
relational basis away from the family unit. These three models can inform TBI rehabilitation practices as much as they can educational practices; ultimately, the goal is to support adolescents to develop the skills, across all domains, which will help them to successfully negotiate society. As an emerging field, TBI rehabilitation is well placed to look to related fields such as motivational and developmental psychology, education and sociology, for models that will allow clinicians to better serve children and adolescents with TBI. To quote Anderson and Yeates (2007, p. 269), “the time appears ripe for an interdisciplinary approach to pediatric TBI that promotes integrative and translational research efforts”.

2.7 Summary

Within the paediatric population, TBI is recognised as the leading cause of death and permanent disability. The “hidden disability”, as paediatric TBI is known, is now coming into full view. TBI is most prevalent in the 15-19 year cohort, who have the highest specific age rate for TBI of 284/100,000 population (Helps et al., 2008). Helps et al. suggested that this figure should be interpreted with caution; they estimated that many children who sustain a mild TBI do not present to hospital, and they believed that the incidence of paediatric TBI is under-reported.

In response to the large number of children and adolescents in Australia who sustain a TBI each year, the service system supporting children and adolescents post-injury has also begun to mature, although research into paediatric and adolescent TBI in particular is still in its infancy. Much research in the paediatric TBI field has focused on
mechanisms of injury and the functional impact of TBI (V. Anderson &
Ylvisaker, 2009). Although the mechanisms of TBI are consistent across
paediatric and adult populations, it is now known that falls and accidents
involving pedestrians versus motor vehicles are the leading causes of
paediatric TBI, rather than accidents involving motor vehicle passengers as
once thought. The functional impact of childhood TBI is different from that
of adult TBI. Practitioners in paediatric TBI rehabilitation now know that
developmental factors such as age, neurodevelopmental stage and
functional maturity at injury, as well as the pre-injury factors such as
academic ability and family functioning, all influence outcomes from injury
(V. Anderson et al., 2005b; V. Anderson & Yeates, 2010; Catroppa &
Anderson, 2009). The cumulative effect of paediatric TBI, in response to
such developmental, functional and adaptive factors, has been well
documented (V. Anderson et al., 2005b; V. Anderson & Yeates, 2010).

Moderate to severe TBI sustained in childhood can, over time, result more
frequently in disability affecting behaviour regulation, psychosocial
adjustment and academic function (Ylvisaker & Feeney, 1998a). A “skill
gap” has been observed between children and adolescents with TBI and
their peers (V. Anderson & Catroppa, 2006). Further difficulties have also
been shown to emerge as children progress through school and academic
demands and societal expectations increase (V. Anderson et al., 2005b).
Translation of such research efforts into evidence-based treatments and
models of care that specifically meet the demands of paediatric TBI has
begun to emerge in the past few years (V. Anderson & Ylvisaker, 2009).
The practice of cognitive rehabilitation has continued to develop since the World Wars. Over the past two decades or so, paediatric TBI rehabilitation has traditionally borrowed adult models or adopted intervention practices used in related fields such as developmental disability. Several researchers, such as Anderson, Yeates, Ylvisaker and Catroppa, have noted the need for a “developmentally specific response” (V. Anderson & Ylvisaker, 2009, p. 253) to paediatric TBI, but studies of the efficacy of paediatric and adolescent TBI rehabilitation are minimal (Catroppa & Anderson, 2009). One of the key lessons of the past decade is that de-contextualised rehabilitation tasks fail to affect a person’s everyday functioning (V. Anderson & Catroppa, 2006) and, conversely, situating rehabilitation in the everyday environments of the person with TBI and collaborating with the people who support that person on a day-to-day basis increases the likelihood of experiencing success with real-world cognitive tasks (Ylvisaker et al., 2002). The theoretical work of Lev Vygotsky, applied to TBI rehabilitation practices by Ylvisaker and Feeney, has been most influential in guiding contemporary models of intervention.

The establishment of developmentally specific responses to paediatric and adolescent TBI requires greater integration between normative theories and models of childhood and adolescent development on the one hand and cognitive rehabilitation theory and practice on the other. To this end, this chapter has reviewed literature describing the developmental period of adolescence and, in particular, the cognitive and self-development typical of this life stage. It is now well known that executive
functioning skills continue to develop through adolescence, with selective attention, response inhibition, decision making and working memory, for example, all showing increased capacity and efficiency across this developmental stage (P. Anderson, 2002). Researchers in paediatric and adolescent TBI have emphasised the need for practitioners in the field to have a better understanding of typical adolescent development, so that deviations in development are detected more readily (P. Anderson, 2002) and so that developmentally appropriate models of care and associated rehabilitation programmes can be advanced (V. Anderson & Yeates, 2007).

In response to this, a model of adolescent social development (SDM), a theory of human motivation (SDT), and a model of self-development (SSPM) were described in this chapter.

The SDM is a formative model of adolescent social development which describes the factors known to support pro-social and antisocial development. This model depicts that the bonds developed between adolescents and the groups they socialise with influence their choices, behaviours and actions (Catalano & Hawkins, 1996). Similarly, SDT emphasises the impact of relationships with others on motivation. Ryan and Deci (2000b) theorised that when the psychological needs of competence, autonomy and relatedness are met, people are more likely to exhibit motivated behaviour. Connell and Wellborn's model of self-development, the SSPM, further emphasises the crucial roles of competence, autonomy and relatedness even more, detailing them as the core psychological needs upon which people builds their sense of self.
These three models each emphasise the importance of secure relational bases for adolescent development. They also emphasise the need for adolescents to experience a sense of autonomy and competence as they strive to develop their sense of self.

As paediatric and adolescent TBI rehabilitation continues to mature, researchers and clinicians need to establish, apply and rigorously evaluate models of intervention that are responsive to, and considerate of, the developmental needs of the population served. The sequelae of paediatric TBI are now well established. It is time to devise developmentally specific responses to these known impairments, responses that are interdisciplinary in nature and that promote collaboration with families to ensure functional outcomes such as improved quality of life and increased participation in chosen life activities. These are the measures of success in paediatric TBI rehabilitation (Catroppa & Anderson, 2009).

2.8 Directions for research

The literature reviewed in this chapter has identified a number of gaps in the knowledge base of paediatric and adolescent TBI rehabilitation. Firstly, few models of care exist, few frameworks for intervention and few resources that incorporate the knowledge base regarding sequelae of paediatric TBI and the likelihood that deficit will worsen with time post-injury. Research is required regarding specific developmental responses to TBI in children and adolescents. Secondary to this gap is the paucity of literature that addresses the implications of TBI for adolescents. Although much has been written about paediatric TBI, there is little that addresses
the adolescence phase and the impact of TBI. The psychological and social aspects of normal adolescent development need to be examined in conjunction with the outcomes of childhood acquired TBI. Lastly, literature sourced for this review focused on the cognitive and executive functioning impairments of paediatric TBI, yet no accounts were found of how adolescents or their family members viewed the cognitive impairments post-injury. There was an absence of studies ascertaining clients’ (children’s, adolescents’ and families’) perceptions of their experience and outcomes of rehabilitation post-TBI. Although the growing body of reports on the experience of returning to school post-injury is acknowledged (not reported in this review), these reports do not deal with the impact of cognitive rehabilitation programmes on adolescents’ perceptions of their cognitive skills.

To help inform the development of cognitive rehabilitation programmes that are age-specific, this study sought to ascertain how adolescents who had sustained a TBI during childhood, and who had subsequently been engaged in a specialist paediatric TBI rehabilitation programme on a long-term basis, perceived their executive functioning skills. The perceptions of a parent of each adolescent were also sought. The mixed methodology adopted for this study is described in Chapter 3.
SECTION TWO:
RESEARCH APPROACH
Chapter 3
Methodology

Introduction

This chapter presents the philosophical framework, research design, procedure, and data analysis used in this study. Before presentation of the research paradigms that influenced the study, the purpose of the research is outlined. A description of the study design follows, with participant selection and recruitment processes, and then data collection techniques are outlined. Harry and Jack, the two main participants of this study, are introduced in this chapter to provide the reader with some background and context prior to reading of their participation in data collection sessions.

Ethical considerations of this project are discussed in this chapter, in conjunction with the relevant procedural descriptions of each phase. The process of data analysis is described and, within this description, particular attention is given to the interpretative approach used with the qualitative data generated by this study. Measures undertaken to ensure scientific rigour of this study are included in this discussion of methodological considerations. The various measures and steps taken to ensure the validity and reliability of the study are woven throughout the discussion of this chapter. The chapter concludes by foregrounding the data presented in the next chapter.
3.1 Purpose of the research

The purpose of this mixed methods study was to:

1. Investigate how adolescents with TBI and a history of participating in cognitive rehabilitation perceived their executive functioning skills, through the use of standardised and normative assessments, self-reported level of competence, and semi-structured interviews.

2. Gain additional insights into these perceptions by contrasting them with adolescents’ mothers’ perceptions of their child’s EF skills.

3.2 Research approach

3.2.1 Research paradigms

In designing research it is important to consider the paradigm or epistemological framework within which that research occurs. A paradigm represents the worldview and assumptions that are associated with that view (Mertens, 2003). It guides the researcher’s approach. Traditionally, two broad research paradigms have existed: quantitative and qualitative. Quantitative research serves to measure, quantify, and test relationships between data. Quantitative research is oriented within the positivist/post-positivist paradigm, in which reality is considered to be stable and, therefore, measurable (Gerber & Moyle, 2004; L. M. Harris, 2004; Polgar & Thomas, 2000).
The term qualitative or interpretative research describes a set of approaches linked by a common naturalistic approach to inquiry (Denzin & Lincoln, 2005). The aim of these approaches is to capture human thoughts, behaviours, and experiences; to describe and understand them, giving credence to the lived experience of individuals (Higgs, Horsfall, & Grace, 2009; Minichiello, Sullivan, Greenwood, & Axford, 2004; Patton, 2002). In interpretative, or constructivist approaches, reality is considered to be dynamic, with the nature of reality being socially constructed (Erlandson, Harris, Skipper, & Allen, 1993). Thus, studies occur within participants’ natural environments, attempting to “make sense of, or interpret phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2005, p. 3; Teddlie & Tashakkori, 2009).

In the later part of the 20\textsuperscript{th} century, a third research paradigm, called pragmatism, gained momentum. It emerged through the increased use of mixed methods research (Teddlie & Tashakkori, 2009), which was primarily aligned with the pragmatist paradigm and concerned with both naturalistic and numeric data (Teddlie & Tashakkori, 2009). The mixed methods approach is well suited to clinically based research. As Higgs et al. (2009, p. 8) noted:

Pragmatic approaches to research design encourage us to adopt multi-disciplinary perspectives and mixed methods strategies for studying situations that involve difference and complex layers of individual and collective practice.
3.2.1.1 Pragmatism

Pragmatism comes from the Greek word meaning “action”, from which the English words “practice” and “practical” were derived (Giacobbi Jr, Poczwardowski, & Hager, 2005). The term was popularized by William James (1907), for whom pragmatism was “an attempt to provide practical solutions to contemporary problems experienced by people and society” (Giacobbi Jr et al., 2005, p. 20). Pragmatic theory has been derived by the work of Peirce, James, Mead, and Dewey, with modern-day support provided by Patton, Cherryholmes, Teddlie and Tashakkori, and Rorty (Creswell, 2003; Giacobbi Jr et al., 2005).

There are many forms of pragmatism, but the central concern of all forms is finding out what works (Creswell, 2003; Patton, 2002). The overarching focus of pragmatism is the problem being investigated, not the methods being applied. Researchers are mandated to use all approaches necessary so as to arrive at an understanding of, and solutions to, the question(s) being posed. This practical approach situates clinical research well within a pragmatic framework.

Pragmatists and constructivists¹ agree that the consequences of inquiry require reflection and analysis. Because of the iterative nature of knowledge construction, the application of research findings must be continuously re-examined. The consequences of research must ensure practical utility, social value, and fairness to anyone who might be affected.

¹ Constructivism: A qualitative research paradigm, also known as naturalistic inquiry, where the investigator and object of investigation are “assumed to be interactively linked so that the ‘findings’ are literally created as the investigation proceeds” (Guba & Lincoln, 2005, p. 111).
by research findings (Giacobbi Jr et al., 2005). These principles, of practical utility, social value, and fairness, are very much in keeping with my belief system and expectations when working with children and adolescents who have a TBI, their families, and their teachers; hence, my motivation to explore a topic using a design that informs my everyday clinical practice.

Alongside this theoretical basis, the expected outcomes from a study fulfilling the requirements for a doctorate in Health Science are that the completed study, which should arise from everyday practice, contributes to improved professional knowledge and practice (Wheat, 2007). Those requirements lend themselves well to a pragmatic approach to research, one that permits the choice of methodology based in the questions and context under investigation. Consequently, a mixed methods approach was chosen for my study as it was, pragmatically, an appropriate methodology to be used. Using mixed methods to investigate my research topic allowed me to investigate the problem at hand and arrive at a solution.

3.2.1.2 Mixed methods research

Mixed methods research gained popularity in the 1980s and 1990s as the third methodological movement of research in the human sciences (Teddli & Tashakkori, 2009). It offered an alternative to the dichotomy of qualitative and quantitative paradigms. Mixed methodologists advocated the use of whatever methodological tools would best answer the research questions at hand (Teddli & Tashakkori, 2009). It was argued that the combined use of quantitative and qualitative paradigms within a study provided a “better understanding” of research problems (Creswell & Plano
Clark, 2007, p. 5). Figure 3.1 presents a combined summary of the utility of a mixed methods approach as published by Creswell and Plano Clark (2007) and Teddlie and Tashakkori (2009).

My study was well suited to a mixed methods approach. Elements of both the positivist and interpretive paradigms were required to support a deep consideration of how adolescents with TBI perceived their executive functioning skills. The underlying philosophical basis to mixed methods research, pragmatism, was also in keeping with the clinical derivation of this project. The context-sensitive framework of rehabilitation centres on finding practical solutions to real-world problems and, as such, links with pragmatism in providing solid guidance for this study.

**Figure 3.1: Summary of the utility of mixed methods research**
(Adapted from: Creswell & Plano Clark, 2007; Teddlie & Tashakkori, 2009)

**Mixed methods research:**

- Can simultaneously address a range of confirmatory and exploratory questions with both the qualitative and quantitative approaches, allowing theories to be generated and verified in the same study.

- Provides better (stronger) inferences through the choice of methods that result in data triangulation and complementarity. This offsets the weaknesses of single research designs.

- Provides the opportunity for a greater assortment of divergent views, encouraging the use of multiple paradigms to reflect on data. This may lead the researcher to consider multifaceted issues more than initially supposed, and offer the opportunity to develop more convincing and robust explanations of the social processes being investigated.
3.3 Participant selection and recruitment

The nature of the approach used for this study and the questions asked meant that data was best obtained through in-depth investigation of a small number of participants. Thus, purposive sampling was used, which Minichiello et al. (2004) considered appropriate when the number of participants was small. Adolescent participants were recruited from the caseload of The Kids’ Team at the South West Brain Injury Rehabilitation Service, Albury, New South Wales. All adolescents on the caseloads of the Team who had a TBI were eligible for inclusion in the study if they were recorded as having average IQ as determined by a neuropsychological assessment, no co-morbidity of ADHD, documented post-injury executive functioning deficits, and were enrolled in Years 10–12 at school and were not receiving case management support from me (the researcher).

Members of The Kids’ Team, not including the researcher, identified potential participants from their current clinical caseloads using these criteria and were asked to consider the appropriateness of approaching each identified family to participate in the study. This included considering the adolescent’s and family’s adjustment to injury, personal resources, and the burden of care currently experienced by parents and siblings as a result of the adolescent’s TBI. From this process, five adolescents and their families were approached to be involved in this study.

After identification of potential adolescent participants, an administration assistant at The South West Brain Injury Rehabilitation Service posted letters inviting the adolescents and their parents to
participate in the study. This included study information sheets and an expression of interest (EOI) form. Copies of these are available in Section 2.1.4 of the accompanying portfolio. Families interested in participating in the study were asked to return the EOI form. Three families indicated interest in participating in the study (through their case managers) but only two families returned the EOI form.

I made an appointment with both families to discuss the study further and to answer any adolescent’s and parent’s questions. During this meeting, consent forms were signed by each adolescent and the respective parents; copies of these are also available in the portfolio. The adolescents were not recruited for the study unless their parents also agreed to be involved in the study; similarly, parents were not recruited for the study unless their child also agreed to participate.

3.4 Introducing Harry and Jack

At the conclusion of the recruitment phase for this study, two adolescent males and their mothers had agreed to participate. Although one adolescent female and her family had reportedly expressed a keen interest in participating, they did not return the EOI and so were not recruited to the study.

The pseudonyms Harry and Jack were allocated to each participating adolescent, and their mothers were identified as Harry’s mum and Jack’s mum to facilitate the readability of text. Harry and Jack had both been engaged with The Kids’ Team since primary school. Both had received multiple blocks of cognitive therapy from the interdisciplinary team, and
both had received case management support from the team which addressed issues relating to return to school, school support, teacher education, curriculum modification, and family support, adjustment to injury and vocational planning and transition, among other things. Harry’s mum and Jack’s mum had also been actively involved in their sons’ rehabilitation and ongoing development. They were highly supportive of their sons but also cognisant of their limitations, cognitive difficulties, and support needs.

I worked with Harry and Jack throughout their engagement with The Kids’ Team, providing language, cognitive and literacy intervention. The power issues inherent in this relationship are acknowledged, but the collaborative foundations on which these relationships were built proved facilitative to the data collection and, in particular, the interview process. The rapport that had been built between me, Harry, Jack, and their mothers facilitated the breadth and depth of disclosure during the data collection phase. Similarly, my knowledge and understanding of Harry’s and Jack’s language and communication needs meant that I was able to support and scaffold their participation in the interview. This level of understanding was particularly important in knowing when, for example, to facilitate word finding, to refrain from talking to allow auditory processing and language generation, or to rephrase a question or comment to prevent communication breakdown and loss of momentum in the interview.

Table 3.1 provides brief biographical information and injury data for each participant. The background information that follows for each
adolescent was ascertained via an audit of their clinical rehabilitation files. Greater detail about Harry and Jack, including background information on the mode of injury, impact of injury, and frequency and type of brain injury rehabilitation services provided by The Kids’ Team, can be found in the in-depth case studies in Sections 2.8.1 and 2.8.2 of the portfolio.

3.4.1 Harry

At the time of participating in this study Harry was aged 18.5 years. He was completing his final year of high school with a predominant focus on his vocational pathway. He was enrolled in a school-based traineeship which meant that he worked at the local army base 2 days per week. This vocational experience proved critical to Harry’s self-perception at the time of participating in this study. He had sustained a severe TBI at 4 years of age when kicked in the head by a horse. His mother reported that prior to the injury Harry was a healthy child who had achieved all developmental milestones at appropriate ages. Harry was engaged with the local brain injury rehabilitation service from school grade 2 to school grade 12. The majority of therapeutic intervention delivered to Harry during late primary school and through high school focused on increasing his planning, organisational, and problem solving skills for verbal and non-verbal domains. Academic tasks and study skills were used as the vehicles to target these executive functioning skills. The most recent recorded standardised intellectual functioning and language assessment data for Harry is summarised in the next chapter.
3.4.2 Jack

Jack was 16.8 years of age when he participated in this study. He was in the first year of a bricklaying apprenticeship. He had sustained a severe TBI just before his seventh birthday, when a truck tyre (wheel and rim) fell on him, pinning his head to a concrete floor. Jack was engaged with the local brain injury rehabilitation service from school grade 2 to school grade 10. The focus of the therapy services provided to Jack was on language and literacy skills in primary school, moving to EF skills, and behaviour support in high school. Academic tasks that Jack needed to complete for school were used as the means for targeting his planning, organisational, and problem solving skills, and for refining his use of strategies to assist with task completion. Results of Jack’s most recent intellectual functioning and language assessments are also summarised in the next chapter.

Table 3.1: Characteristics of participants

<table>
<thead>
<tr>
<th>Participant / Characteristics</th>
<th>Harry</th>
<th>Harry's mum</th>
<th>Jack</th>
<th>Jack's mum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18;5 years</td>
<td>49 years</td>
<td>16;8 years</td>
<td>37 years</td>
</tr>
<tr>
<td>Occupation</td>
<td>Student / Army Reservist</td>
<td>Theatre nurse</td>
<td>Apprentice bricklayer</td>
<td>Mother</td>
</tr>
<tr>
<td>Highest level of education</td>
<td>Enrolled in Year 12</td>
<td>Postgraduate certificate</td>
<td>Year 10 (School Certificate)</td>
<td>Year 10 (School Certificate)</td>
</tr>
<tr>
<td>Age at injury</td>
<td>4;10 years</td>
<td></td>
<td>6;11 years</td>
<td></td>
</tr>
<tr>
<td>Years post-injury</td>
<td>13;7 years</td>
<td></td>
<td>9;9 years</td>
<td></td>
</tr>
<tr>
<td>Severity of injury</td>
<td>Severe</td>
<td></td>
<td>Severe</td>
<td></td>
</tr>
<tr>
<td>Number of siblings (place in order)</td>
<td>2 sisters (youngest)</td>
<td>3 sisters 2 brothers (oldest)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethical consideration</td>
<td>Strategies applied</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Obligation to participate in research: It was highly likely that adolescents and their parents would feel obliged to participate in this research as they had received rehabilitation services from the organisation that I worked for as a speech pathologist. I was known to the families who were approached through prior provision of speech, language and cognitive therapy. | ▪ Clear information sheets stressing voluntary involvement were provided.  
▪ The adolescent’s current case manager was used to commence recruitment. At no point was I engaged with the identification of potential adolescent participants.  
▪ Adolescents and their parents were required to return an EOI form prior to engaging in any discussion about the study with any member of The Kids’ Team (this protected staff members from becoming engaged in recruitment, thereby further limiting the prospect of coercion). It was only when the EOI form was returned that I became aware of who had been invited to participate in the study.  
▪ It was made clear, through information sheets, consent forms, and during discussions with all participants, that the adolescent or their parent could withdraw at any time without jeopardising the service they received from The Kids’ Team. |
| Recruitment of adolescents: | A two stage consent process was used:  
▪ Following the return of an EOI form, an appointment was made with each adolescent and parent(s) to further discuss the project, explicitly discuss anticipated ethical considerations for participating in the study, and advise participants of their right to withdraw from the study at any time.  
▪ Consent was obtained from parents prior to obtaining consent from each adolescent. It was made clear that recruitment could only proceed if both parent and adolescent consented. |
**Ethical considerations during recruitment phase**

The process of obtaining ethical approval for this study was two-fold. Initially, approval was obtained from the Charles Sturt University Human Research Ethics Committee (protocol number 2006/106) and then, as adolescents were recruited from the South West Brain Injury Rehabilitation Service, approval was obtained from the governing organisation, Greater Southern Area Health Service (protocol number 2006/11). The ethical considerations addressed in relation to the recruitment process of this study are summarised in Table 3.2. Other ethical considerations arising from this project are discussed later in this chapter in conjunction with the relevant procedural discussion.

### 3.5 Data collection

**Study design**

A number of researchers have proposed typologies for mixed methods research. The triangulation design has been proposed by Creswell and Plano Clark (2007). A triangulation design is characterised by simultaneous collection of qualitative and quantitative data, with convergence of the data occurring at the interpretation stage of research (Creswell & Plano Clark, 2007). This creates a triangulation of data sources (Creswell, 2003).

Figure 3.2 illustrates a triangulation design, with the notation used taken from the system developed by Morse (1991) (cited in Creswell, 2003). As illustrated in this figure, the two data sets are collected and analysed separately, as quantitative data requires quantitative analysis and qualitative data requires qualitative analysis. The strength of a
triangulation design is that complementary data sets are collected, with each offsetting or compensating for the weaknesses of the other (Creswell & Plano Clark, 2007). Triangulation of distinct methods “provides greater opportunities for accurate inferences” (Teddlie & Tashakkori, 2009, p. 75).

**Figure 3.2: Visual map of a triangulation mixed methods design**
(Adapted from Morse, 1991, and Creswell, 2003)

Creswell (2008) suggested that the use of triangulation could enhance the rigour of a study. Triangulation occurs between theories, data sources, methods of data collection and analysis procedures, researchers, and inferences concluded at the end of a study (Creswell, 2008; Teddlie & Tashakkori, 2009). Ultimately, this broadens the perspectives obtained about the phenomenon being investigated, adding depth and richness to an inquiry (Denzin & Lincoln, 2005). My study applied triangulation to the:
- Data source, by collecting the perspectives of adolescents and their mothers;
- Data methods and types, through the use of standardised and normative assessments, stimulated recall and unstructured interviews, and researcher observations and field notes; and
- Data analysis, through review and re-coding of transcripts by multiple reviewers and use of each data set in a complementary manner to extend or illustrate the other.

The next section describes how all data was collected for this study. The multiple phases of data collection that occurred with adolescents and their mothers are outlined and a description of each tool used in each phase is presented, along with a procedural description of how each tool was used. The ethical considerations pertinent to data collection are then outlined, before a description is provided of how each data set was analysed. By presenting a description of each tool, how it was used in this study, and at what point it was used, the mixed methods, triangulation design adopted is clearly illustrated.

### 3.5.1 How data was collected: a description of the tools and procedures

At the commencement of data collection the adolescent participants were assigned the pseudonyms “Harry” and “Jack”, to maintain confidentiality. Harry participated in three data collection sessions and Jack in four. Jack required an extra session as he repeatedly requested my
assistance to complete one task (completion of a homework task), reducing what could be completed in that session. As he was cognitively fatigued by the end of this task, I used my clinical judgement and decided to not attempt any other tasks in that session. Harry and Jack participated in this research separately.

Data collection occurred in a manner considerate of each participant; consequently, sessions were conducted at venues of each participant’s choice. Harry chose the Learning Support area of his school and all sessions were conducted when he had “free lessons”. Jack participated in sessions when he was in Albury attending TAFE (vocational training programme), and elected for all sessions to be held in the evening, after his TAFE programme had concluded for the day. Sessions with Jack were conducted in an interview room at Charles Sturt University. Harry’s and Jack’s mothers participated in one in-depth interview each. Again, these occurred at a venue of their choice. Harry’s mother chose to have the interview in her home, and Jack’s mother had the interview in a café in her local town.

As expected in mixed methods research, the study used a variety of tools to collect quantitative and qualitative data. The majority of the tools collected either quantitative or qualitative data, and one tool produced both quantitative and qualitative data. The data type(s) obtained from each tool are displayed in Table 3.3.
Table 3.3: Data sources and types

<table>
<thead>
<tr>
<th>Data source</th>
<th>Quantitative data</th>
<th>Qualitative data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of Problem Solving – Adolescents (TOPS-2)</td>
<td>Standard scores &amp; percentile ranks</td>
<td></td>
</tr>
<tr>
<td>Party Planning Task (PPT)</td>
<td>Frequency count of (a) errors &amp; (b)</td>
<td>Verbal protocol</td>
</tr>
<tr>
<td></td>
<td>efficiency measures</td>
<td>Field notes</td>
</tr>
<tr>
<td>Competency Rating Scale (Visual Analogue Scale)</td>
<td>Ratio data (descriptive statistics)</td>
<td></td>
</tr>
<tr>
<td>Stimulated recall task</td>
<td></td>
<td>Verbatim transcript</td>
</tr>
<tr>
<td>Researcher observation</td>
<td></td>
<td>Field notes</td>
</tr>
<tr>
<td>Unstructured interview</td>
<td></td>
<td>Verbatim transcript</td>
</tr>
</tbody>
</table>

3.5.2 Phase One: Rapport establishment and standardised assessment

Although, as the researcher, I had previously met with Harry and Jack and their families to discuss the purpose of the research, expected time commitments, and ethical considerations, the initial session commenced with a review of these matters. The Test of Problem Solving – Adolescent (TOPS-2) (Bowers, Huisingh, & LoGiudice, 2007) was then administered; this was done because the study was grounded in clinical practice and, through their rehabilitation experiences, Harry and Jack were familiar with completing standardised assessments. This process had contributed to the previous therapeutic relationships that existed between Harry, Jack, and me, and so was a known and expected activity. Completing standardised assessment tasks also created the context used later to have Harry and Jack discuss their self-reported levels of competence. This shared context was created to facilitate the collection of qualitative data via recursive
interview and a self-reflection activity. The observational and self-reported data collected during these standardised tasks was reflected upon in the separate interviews held later with the mothers of Harry and Jack. Observations of Harry and Jack, as well as recordings of their comments about their performance, were used to evoke comments from the mothers about how they perceived their son’s competence and confidence. The opportunity to use quantitative and qualitative data in this way was the motivation for the adoption of a mixed methods approach in this study. It also explains why data collection occurred in several phases, with the quantitative data used to facilitate discussion in the in-depth interviews.

The raw data gathered from the TOPS-2 allowed the calculation of standard scores, percentile norms, and age equivalent scores, which allowed comparison of Harry’s and Jack’s results with a normative sample. It served as a means of confirming the clinical severity of residual impairment for Harry and Jack. The reliability and validity of the TOPS-2 were reported in the Examiner’s Manual (Bowers et al., 2007). The reliability was established using test-retest and internal consistency methods during the standardisation process, and the mean value of inter-rater reliability was 85%. Empirical validity was determined using contrasted groups and bi-serial correlation showed item consistency at 94%, with individual items showing statistically significant pass/fail correlation with subtest scores (Bowers et al., 2007).

The TOPS-2 (Bowers et al., 2007) was administered in accordance with the instructions in the Examiner’s Manual. Harry and Jack were assessed
separately. A typical testing situation was established, with Harry or Jack sitting opposite me at a table when they completed the TOPS-2. The test stimuli and a blank piece of white paper were placed in front of Harry and Jack. They were informed that they could use the blank paper to cover items on each page that had not yet been administered, should they need to reduce the amount of distracting visual stimuli. Testing commenced with the first item and progressed through all items. Each item was read aloud to the adolescent while they followed by silently reading the printed passage in front of them. The instructions for the TOPS-2 did not permit repetition, re-wording, or paraphrasing of material, but material could be defined if requested by the adolescent.

Both Harry and Jack produced responses that could be scored for each item on the TOPS-2 response form. Responses that matched one of the listed responses were circled on the test form; responses that did not match the listed responses were recorded verbatim and scored later. To maintain the flow of item presentation and to not centre the focus of the session on correct/incorrect answers, scoring of items did not occur during testing. Harry and Jack each took approximately 45 minutes to complete the TOPS-2 assessment.

3.5.3 Phase Two: Ecological assessment, participant self-reflection and researcher observation

The second phase of data collection with Harry and Jack focused on collecting data that began to capture their perception of their executive functioning skills. This was achieved through the use of the Party Planning Task (PPT) (Chalmers & Lawrence, 1993) and two other data collection
tools associated with it, the *Competency Rating Scale* (a visual analogue scale) and a *Stimulated Recall Task*. Harry and Jack were also observed completing a homework task that had been set by one of their teachers. This was done so that through observation, each adolescent’s performance on structured and unstructured tasks that tapped executive functioning skills could be contrasted; this was a method I frequently applied in clinical practice, and it often provided valuable insights into a person’s everyday skill level. The PPT and homework task were used to identify how Harry and Jack perceived their executive functioning skills and their level of competence.

*The Party Planning Task* (PPT) (Chalmers & Lawrence, 1993) is a functional assessment of planning skills that allows the process undertaken to complete the task to be observed, as well as providing norm-referenced scores, which allowed for peer comparison. The PPT is a complex planning task, requiring participants to plan an unexpected party, meeting a number of listed constraints. Harry and Jack were given a planning aid (an A3 sheet of paper) on which to record their plan. Responses to the task were coded according to errors (time, allocation, and omission) and efficiency (chunking, purpose, error detection, error correction, monitoring, and time taken to complete the task). Each adolescent was also prompted to verbalise his thoughts and plan as he proceeded with the task. This ‘think aloud’ strategy created a verbal protocol which was used to assist with analysis of performance. Harry and Jack were also video recorded completing the PPT and this was later used in the stimulated recall task.
The PPT was administered following the guidelines described by Todd, Anderson, and Lawrence (1996). Harry and Jack were given a copy of the instructions and an A3 visual planning aid. Once the task requirements had been clarified, each adolescent commenced the task; at this point, timing commenced. Timing ceased when the adolescent indicated he had finished the task. Field notes were recorded as Harry and Jack worked through the PPT. These included observations of the approach taken by them to commence and progress the task, executive functioning strategies adopted, behavioural and emotional reactions, levels of attention, and assistance seeking. They were instructed to “think aloud” as they completed the task, with prompting provided if they had been silent for more than one minute. Thoughts that were verbalised during the assessment formed the verbal protocol, which along with the completed A3 planning aid, were the products of this assessment.

Administration of the PPT was video recorded. This was: (a) replayed to each adolescent immediately following his PPT completion to prompt a stimulated recall, and (b) reviewed by the researcher, along with Harry’s or Jack’s comments during the task (verbal protocol) to code as a means of measuring efficiency.

**Stimulated Recall Task:** Stimulated recall is an introspection procedure that has been widely used in educational research to investigate cognitive processes and metacognition (Desoete, 2009; Lyle, 2003). Lyle (2003) explained that stimulated recall benefitted naturalistic inquiry because of its unobtrusive method. Simulated recall was used in the present study
because it was anticipated that it would provide narrative data that captured Harry’s and Jack’s perceptions of their executive functioning skill, exemplifying their metacognitive skills.

Harry and Jack were each shown the video recording of themselves completing the Party Planning Task. They were prompted to comment and reflect on their approach, strategies they used, behavioural and emotional reaction to the task, and any other relevant features. Their comments were audio-recorded and later transcribed. Audio-recordings and corresponding transcripts were later reviewed for indicators of metacognitive skills, comments describing each adolescent’s perceptions of his EF skills, and comments indicating a level of competence in executive functioning skills.

**Competence Rating Scale:** The third task completed in the second phase of data collection with Harry and Jack was the Competence Rating Scale, or Visual Analogue Scale (VAS). The VAS was used as it was considered one of the simplest methods that could be used to assess the “intensity of a subjective experience” (Portney & Watkins, 2000, p. 302). Harry and Jack were asked to indicate how competent they felt in completing the PPT. An operational definition of competency was developed and agreed upon by the research team and was included in the information preceding the VAS to inform and focus the participant. A copy of the VAS is included in Section 2.5.3 of the portfolio. The VAS method has been shown to be a reliable and valid measure for use with people who have language impairment (Brumfitt & Sheeran, 1999), and within this study it was used to help negate language impairments that both
adolescents were known to have. Through using the VAS, Harry and Jack did not have to comprehend nor produce large amounts of written or verbal information.

The VAS developed for this study was a 100-millimetre line anchored by an emoticon at either end. An emoticon is a textual graphic that represents a mood or facial expression (Wikipedia). The length of the line on each copy of the VAS was checked to ensure that it was consistent and that printing had not altered the VAS. The left-hand end of the line was anchored by an emoticon depicting an unhappy face, and the right-hand end by an emoticon depicting a happy face. The VAS was reviewed by the research team to ensure content validity prior to being employed in the study. A copy of the VAS is included in Section 2.5.1 of the portfolio.

After completing the PPT and before engaging with the stimulated recall task, Harry and Jack were each asked to indicate how competent they felt about their performance by completing the VAS. They did this by marking an intersecting line on the 100-millimetre line that formed the VAS. Without prompting by the researcher, Harry and Jack both placed several marks on the line, indicating a change in their sense of competence from commencing to completing the PPT. Jack provided verbal descriptions of how competent he felt as he placed marks on the VAS, and these were audio-recorded and later copied onto the VAS sheet alongside the corresponding mark. Using the method of measurement described by Portney and Watkins (2000), each mark was measured in millimetres from the anchor point and converted to a percentage. This percentage
represented the level of competence Harry and Jack reported at the start, middle, and end of doing the PPT.

**Observation:** Field notes recording observations of Harry and Jack completing the PPT and a homework task were made. The observation focused on their demonstration of executive functioning skills/strategies, behavioural and emotional reactions to the task (initially and then as the task progressed), task efficiency, and use of environmental resources (including textbooks, models, researcher, etc.). On completion of the task, Harry and Jack were each invited to comment on how they had perceived and performed the task, using the metacognitive prompt questions of, “What worked? What didn’t work? What would you do differently next time?” Comments were recorded and later compared with the other comments made by Harry and Jack following the completion of the PPT.

**Homework task:** Harry and Jack were both observed completing a homework task. The specific homework task used as a stimulus for the observation was chosen by each adolescent. This homework task had to be a curriculum-based task stemming from their academic or vocational studies. Harry chose to complete four text comprehension questions set by his history teacher. When asked why he chose this task, Harry commented that history was his favourite subject and he often chose to complete homework associated with this subject in preference to anything else. Jack chose a listing task that relied on recall of information presented in class along with text revision and copying. Jack had a list of common bricklaying terms and tools, and was required to define or describe each term. When
asked why he had chosen this task, Jack replied that: (a) the task was due the following day and he had not managed to complete it in the preceding month; and (b) he anticipated he would have some difficulty formulating written answers, and preferred to complete the task when he knew he would have access to another person to assist him.

As with the PPT, observations of the approaches taken by each adolescent to commence and progress the task, the executive functioning strategies they adopted, their behavioural and emotional reactions, levels of sustained attention, and assistance seeking behaviours were recorded. I sat at right angles to Harry and Jack so that I could easily observe them work through the task and assist them if requested. Harry did not seek assistance with his task but Jack did so repeatedly.

3.5.4 Phase Three: Interviews

If you want to know how people understand their world and their life, why not talk to them? (Kvale, 1996, p.1)

The final method of data collection was individual, face-to-face interviews with Harry, Jack, and their mothers. Unstructured interviews provided the forum to explore their perceptions of the adolescents’ executive functioning skills. In-depth interviews were used as they allowed a more interpersonal exchange with participants, offering participants and me the opportunity for reflection. In-depth interviews also provided me with the opportunity to convey interest and respect for the participants’ subjective experiences.
For Harry and Jack, this created an opportunity to explore their confidence in their executive functioning skills as well as how competent they felt in applying these skills to everyday tasks and contexts. For their mothers, the interviews provided an opportunity to explore their level of confidence and competence in their sons’ skills within the context of daily life, and especially, it emerged, as influenced by normal adolescent development. Unlike structured interviews, which are used to capture data that can be quantitatively coded to explain behaviour within pre-established categories, the aim in using unstructured interviews is to understand the complex behaviour of people, without imposing categorisation that could limit the field of inquiry (Fontana & Frey, 2005). To explore the adolescent and parental perceptions of EF skills, and to expand upon and complement data collected through the other tools used, it was important that recursive interviews occurred so that Harry, Jack, and their mothers could tell their story (Minichiello, Madison, Hays, & Parmenter, 2004). By the application of a recursive method to interviews, the participants were encouraged to offer information through a conversational approach, and all efforts were made to follow the advice of Minichiello et al. (2004) to maintain a typical conversational interaction during the interviews. My pre-existing relationships with Harry, Jack, and their mothers facilitated this approach.

Harry, Jack, and their mothers each participated in one unstructured, in-depth interview. Participants were individually interviewed. Some additional data relevant to ascertaining participants’ perceptions of
confidence and competence in their, or their son’s, executive functioning skills, was also obtained in subsequent conversations such as when transcripts were checked for accuracy with each participant. As the pseudonyms of Harry and Jack were allocated during the scoring and coding of quantitative data, their mothers were referred to as Harry’s mum or Jack’s mum rather than by their individual names, to make easy connections between interview excerpts of the mother and son, rather than having to continually recall the familial connections.

All interviews, which lasted between 40 and 120 minutes, were audio-recorded with participants’ consent. Each interview was transcribed verbatim and analysed. Field notes were recorded immediately following each interview to supplement the recorded material, to note each participant’s emotional and behavioural state and to identify any prominent topics or features of the interview.

**Ethical considerations during data collection**

The two main ethical considerations during the data collection phase of the study were maintaining participant confidentiality and protecting participants from undue burden, distress and risk. Exploring a person’s perceptions of an experience places that person at risk of exposure, exploitation, and embarrassment (Stake, 2005). The ethical considerations addressed in relation to the data collection phase of this study are outlined in Table 3.4.
<table>
<thead>
<tr>
<th>Ethical consideration</th>
<th>Strategies applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintaining confidentiality</td>
<td>▪ Participants were allocated a pseudonym at the commencement of data collection. This was used in all interview transcripts, data reports, and subsequent presentations and publications arising from this study.</td>
</tr>
<tr>
<td></td>
<td>▪ Data collection occurred in venues and at times chosen by the participants. Participants were prompted to nominate locations in which they would feel at ease and not be concerned or distracted by being identified as participating in a research study.</td>
</tr>
<tr>
<td></td>
<td>▪ All audio, video, and paper materials generated by this study were labelled with participant pseudonyms and stored in a secure location.</td>
</tr>
<tr>
<td>Emotional impact (upset/distress on recall)</td>
<td>▪ There was the potential for the adolescents to become distressed as they completed both structured and unstructured assessment tasks, if it became apparent that they were not completing the task successfully. In such instances, clinical judgement regarding continuation of the task would have been applied.</td>
</tr>
<tr>
<td></td>
<td>▪ Although all participants were at risk of becoming upset when reflecting, describing, and discussing executive functioning skills and functional impact post-TBI, only Harry briefly experienced this during data collection. This was addressed as the situation arose, using skills acquired through clinical practice. The topic of conversation causing distress was ceased and an alternative topic, known not to induce distress was introduced. Prior to revisiting the emotionally laden topic, it was introduced, checking with Harry and agreeing with him on a hand signal that could be used to immediately end the topic if it was again causing distress. Checking regarding his emotional state occurred again at the end of the interview, at which time he reported no emotional distress. Had this continued, his case manager with The Kids’ Team would have been advised and appropriate follow up provided through the Team.</td>
</tr>
</tbody>
</table>
3.6 Data Analysis

In keeping with the mixed methods approach adopted for this study, data was initially analysed separately, with the quantitative data analysed using methods appropriate to each data set generated, and qualitative data interpreted using interpretative phenomenological analysis (IPA) (Smith, Flowers, & Larkin, 2009). As a triangulation design was used, data was then amalgamated during the interpretation phase. It should be acknowledged that, although the analysis procedures undertaken are listed individually here for purposes of clarity, in reality they were undertaken concurrently as a continual and mutually informative process; the themes that emerged from the in-depth interviews were considered in light of the quantitative results obtained and field notes recorded throughout data collection.

3.6.1 Quantitative data analysis

3.6.1.1 TOPS-2

In accordance with the scoring protocol, a score of one or zero was assigned to each test item for the TOPS-2. Responses were scored based on the relevance of the response to the question and the quality of the response in relation to the intent of the message, semantics and vocabulary (Bowers et al., 2007). Responses that did not match those listed on the test form were scored using the Scoring Standards in the TOPS-2 Examiner’s Manual (Bowers et al., 2007). The scoring standards list both acceptable and unacceptable responses for each test item; however, the scoring guidelines listed for the TOPS-2 allow clinical judgement to be used in determining if a response captures the semantic intent of the acceptable
responses that are listed. The total number of items scored correctly formed the raw score achieved for the TOPS-2. By using the normative and statistical tables located in the Examiner’s Manual, the raw score was converted to a standard score and percentile rank, allowing comparison between the individual’s score and the normative test cohort.

Conversion of raw scores to standard scores and percentile ranks for the TOPS-2 was completed in accordance with the procedure described in the Examiner’s Manual for this test (Bowers et al., 2007). The TOPS-2 used a mean standard score of 100 and a standard deviation of 15. Harry’s and Jack’s scores were compared against the standard score and deviation to determine a “level of severity”. As explained in the introduction to this exegesis, because of word limitations, the quantitative data collected during this study is not included in the findings chapter of this exegesis. The qualitative data and findings are the focus of this exegesis from Chapter 4 onwards. The TOPS-2 scores for each adolescent are recorded in their case presentations, located in the portfolio (Sections 2.8.1 and 2.8.2).

3.6.1.2 PPT

Analysis of data obtained through the PPT followed guidelines set down by two previous studies (Pentland, Todd, & Anderson, 1998; Todd et al., 1996). Each visual planning aid was coded for errors and scored using the method described by Pentland et al. (1998) in a study of the EF skills of adolescents with TBI. In keeping with that study, error measures for omission, time and allocation were derived. Definitions for each of these criteria are listed in Table 3.5. The number of errors made was counted, as
was the total number of items planned correctly by Harry and Jack. This was then converted to a percentage. For example, if a participant included 21 tasks in his final plan a score of 100% correct was allocated for the omission criteria (indicating that no tasks were omitted from the final plan). To ensure reliability, each plan was re-coded by one of the supervisors of this study, using the agreed protocol, with agreement at 83% for one participant’s plan and 79% for the other. Discrepancies were discussed until agreement was reached.

Data recorded from the participant’s verbal protocols was then coded for efficiency and a frequency count was recorded for each criterion. This analysis was in keeping with the method used by Todd et al. (1996) when they investigated the planning performance of 18 adolescents with mild-moderate TBI compared with uninjured matched peers. Their description of coding and analysing efficiency measures was more comprehensive than that of Pentland et al. (1998). Definitions for each of these criteria are also listed in Table 3.5. Each verbal protocol was coded by the primary researcher and then by another experienced TBI rehabilitation clinician familiar with the PPT. Inter-rater reliability of 100% was achieved for this process.

*Competency Rating Scale*

Harry and Jack each placed several marks along the 100-millimetre line that formed the VAS. The corresponding value for each of these marks was determined, and is reported in each adolescent’s case study available in Sections 2.8.1 and 2.8.2 of the portfolio. To convert this to numeric data,
the distance of this mark from the left hand anchor was measured in millimetres. This number was then converted to a percentage.

Table 3.5: Definitions of criteria used to score the PPT

<table>
<thead>
<tr>
<th>Criteria used for error measures</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omission</td>
<td>A task was left out of the final plan</td>
</tr>
<tr>
<td>Time</td>
<td>Implicit or explicit time requirements for a task were violated</td>
</tr>
<tr>
<td>Allocation</td>
<td>A task was assigned to an inappropriate person</td>
</tr>
</tbody>
</table>

Criteria used for efficiency measures

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chunking</td>
<td>Grouping tasks together</td>
</tr>
<tr>
<td>Purpose</td>
<td>Participant verbalised how he were going to approach the task</td>
</tr>
<tr>
<td>Error detection</td>
<td>Spontaneous recognition by participant of his mistake in the plan</td>
</tr>
<tr>
<td>Error correction</td>
<td>Participant altered his plan as a result of detecting an error</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Participant checked elements of the instruction or their own plan with the researcher</td>
</tr>
</tbody>
</table>

3.6.2 Qualitative data analysis

3.6.2.1 Stimulated Recall

Each audio-recording of the stimulated recall was transcribed verbatim. An audio-recording time reference was made alongside each comment that communicated a description or explanation of a problem-solving attempt, decision-making process, acknowledgement of executive functioning difficulty, or use of an executive functioning strategy. These
comments were then extracted and grouped. Each grouping was reviewed and assigned a category name. This data was then incorporated with the interview data and analysed using the IPA approach described below in Section 3.6.4.1.

3.6.2.2 Interviews

A verbatim transcript was created from the audio-recordings of each interview. These were analysed using principles of IPA following the heuristic framework outlined by Smith, Flowers and Larkin (2009).

3.6.3 An introduction to Interpretative Phenomenological Analysis

Interpretative Phenomenological Analysis (IPA) is described as a phenomenological research approach to examining how people make sense of major life experiences (Smith et al., 2009). The development of the IPA approach is informed by three key philosophical concepts: phenomenology, hermeneutics, and idiography. IPA is concerned with human lived experience, and posits that experience can be understood by examining the meanings people imprint upon the experience. IPA is underpinned by the notions of the hermeneutic phenomenologist Heidegger, who proposed that “phenomenological inquiry is from the outset an interpretative process” (Smith et al., 2009, p. 32). From an idiographic standpoint, IPA situates individuals within their particular contexts, exploring each individual’s experiences, and starting with a detailed examination of each individual’s case before moving toward more general claims. Dean, Smith and Payne (2006) align the origins of IPA with symbolic interactionism, with its central view being that how people
perceive an experience is directly reflected in the way they talk about that experience and behave in relation to it. They state, “meanings occur as a result of social interaction. It is only through interpretation that these meanings can be understood” (Dean et al., 2006, p. 141). This premise is particularly apparent in the interpretations that arose from this study.

Although grounded in philosophical knowledge that has a long history, as an approach to qualitative data collection and analysis IPA has a very recent history (see Smith, 1996). IPA surfaced through psychological literature, but is now used to research other social and health fields (Dean et al., 2006). The approach lends itself to health-based research, and through its explicit acknowledgement of the importance of the researcher’s interpretation it is thought to be particularly useful for clinically based research. It is generally accepted that IPA accommodates the backgrounds of clinical researchers, who often struggle to divorce themselves from their acquired knowledge and clinical experience (Dean et al., 2006). In the design of this study, a key consideration was to select a method that complemented my clinical background and prior knowledge of the participants, making IPA an ideal approach.

3.6.4 The use of IPA principles in data analysis

Jonathan Smith, the original proponent of IPA, considered the hermeneutic “turn” to be an effective way of considering the “method” of IPA (Smith et al., 2009). He proposed that the primary tenet of IPA was that the analytic process was iterative. Smith and colleagues expanded on this:
Making sense of what is being said or written involves close interpretative engagement on the part of the listener or reader. However, one will not necessarily be aware of all one’s preconceptions in advance of the reading, and so reflective practices and a cyclical approach to bracketing are required. (Smith et al., 2009, p. 35)

Consistent with this view, the process shown in Table 3.6 was not a prescribed, linear approach. Rather, a circular approach was adopted, with data revisited many times to make sense of participants’ experiences. This table was informed by the approach of Smith et al. (2009) and is described below.

3.6.4.1 The process used for this study

The qualitative data analysis process used is depicted by a hand drawn schematic in Figure 3.3. This drawing captures the iterative method used, the steps adopted to ensure rigour and validity of findings, and, in keeping with a pragmatic approach, the emphasis placed on determining useful, translatable, and practical findings. The description provided here articulates the information conveyed by the schematic.
Table 3.6: Steps to analysis in IPA (Smith et al., 2009)

<table>
<thead>
<tr>
<th>Step</th>
<th>Researcher activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading and re-reading</td>
<td>• Immerse self in original data</td>
</tr>
<tr>
<td></td>
<td>• Record striking and powerful recollections of interview or observation of transcript</td>
</tr>
<tr>
<td>Initial noting</td>
<td>• Examine semantic content and language used, at an exploratory level</td>
</tr>
<tr>
<td></td>
<td>• Aim to produce comprehensive, detailed set of notes and comments on data, including an initial code set</td>
</tr>
<tr>
<td>Developing emerging themes</td>
<td>• Analyse exploratory comments via extrapolating and focusing on chunks of transcript</td>
</tr>
<tr>
<td></td>
<td>• Move to a more central role in interpretation</td>
</tr>
<tr>
<td></td>
<td>• Perform ‘collaborative’ interpretation. Themes reflect participant’s original words but analyst’s interpretation also</td>
</tr>
<tr>
<td>Searching for connections across emergent themes</td>
<td>• Move from chronologically ordered themes to mapping how analyst thinks they fit together</td>
</tr>
<tr>
<td></td>
<td>• Aim to produce a structure that points to the most interesting and important aspects from participant’s account</td>
</tr>
<tr>
<td>Moving to the next case</td>
<td>• Repeat the process</td>
</tr>
<tr>
<td></td>
<td>• Treat this case in its own terms. Rigorous adherence to this allows new themes to emerge</td>
</tr>
<tr>
<td>Looking for patterns across cases</td>
<td>• Compare each theme map</td>
</tr>
<tr>
<td></td>
<td>• Question the themes in light of each other</td>
</tr>
<tr>
<td></td>
<td>• Identify robust themes, super-ordinate themes in individual cases and higher-order concepts represented across cases</td>
</tr>
</tbody>
</table>
Figure 3.3: Hand drawn schematic depicting qualitative data analysis
The first step in data analysis was the creation of verbatim transcripts of each interview and stimulated recall task. Transcribing the interviews and recall task helped me to be immersed in the data and gain initial insights to the issues discussed by each participant. It also allowed me to listen, repeatedly, to the tone, expression, and at times, emotion conveyed by participants, further increasing my understanding of their experiences and perceptions. This process allowed me to develop intimate knowledge of the data and, at a superficial level, to commence creating links within and between transcripts. This was the first stage in building a preliminary code set that was used in subsequent data analysis.

Each transcript was re-read on many occasions, with a hard copy of the transcript forming the record sheet for notation, coding, and further analysis. Codes were documented in the left-hand margin of each transcript and notations in the right-hand margin. Once I was satisfied that all relevant data had been identified, codes were grouped to form themes. This process was achieved primarily by listing all the codes within one transcript, and then grouping and re-listing semantically related codes. Excerpts were then taken from the interview and mapped against the themes to ensure congruence across the data. A section within my journal was set aside for each participant’s thematic map to be recorded. Thus, when individual data was considered collectively, these pages held a record of all themes that had emerged from the interviews.

To create super-ordinate themes, a process similar to that adopted for individual transcripts was used. Themes from individual transcripts were
reviewed and semantically linked themes were grouped together; each super-ordinate group was re-labelled, sometimes with a theme from within the group; sometimes with a new label that represented the collective meaning of the participants’ words and my interpretation. During this process it was frequently necessary to return to each transcript and ensure that interpretation continued to reflect participants’ words. This process, referred to by Smith at al. (2009) as bracketing, often occurred because my interpretative thinking was influenced by another theme, or by my clinical knowledge. I had to remain vigilant at this time that my interpretation of data was not clouded by my desire to create clinically applicable findings.

Throughout this process, results and reflections from other data sources were drawn in. Comments made by Harry and Jack were compared and contrasted with results from the TOPS-2, PPT, verbal protocol, and stimulated recall, and particularly from the competency rating scale when comments pertaining to confidence and competence in skills were made. Triangulating data in this way further informed the analysis and interpretation and allowed me more confidently to begin to assert the findings of this study and make links to implications for clinical practice.

During this process, visual representations of the key emerging themes were created. This too was an iterative process, with a number of diagrams produced, each informing the next and the ongoing analysis and interpretation of data. Such visual modelling was particularly useful in detecting links and relationships between each key theme. It also helped in
considering the preliminary findings in light of clinical knowledge and the resonance of findings with that knowledge.

At this point, the transcripts, their associated codes and the preliminary themes were read by the study supervisors for verification purposes. This was the commencement of triangulation processes in the data analysis phase. Differences in interpretations were discussed and the preliminary key themes were decided upon. In an effort to ensure the robustness of themes, de-coded excerpts from the interviews along with the preliminary themes were provided to two independent coders. These two allied health professionals (one speech pathologist, one occupational therapist), both of whom had experience in working with the adult TBI population as well as postgraduate research experience, independently analysed the excerpts using the themes provided. These documents were then compared with the complete transcript set and I ascertained the level of agreement in use of themes. While this process resulted in general agreement between coders it also provided an opportunity for discussion of themes, further enhancing my ability to define and explain the findings of the study.

At this time, the participants were invited to review analytical material. This process, known as member checking (Mays & Pope, 2000), was used to ensure that the interpretations were trustworthy and representative of participants’ experiences and meanings. This step was also taken as a means of achieving interpretive rigour, an important consideration in qualitative research (Lincoln & Guba, 1985). Just as all participants were
offered the opportunity to review transcripts from their interviews, all were offered the opportunity to review themes that had emerged from their interviews and the study overall. Only Harry’s mother chose to review any material at this stage.

Throughout the data analysis phase I recorded notes and “running thoughts” that posed questions, provided cursory interpretations of data, and linked codes, in an effort to commence the development of themes. I also maintained this running record in an effort to ensure that my initial interpretive thoughts were not lost. These notes recorded my interpretation of implications the data might hold for clinical practice. This process was employed in an effort to bracket my thoughts and interpretations relevant to each transcript as I moved through the data set. Throughout the data analysis phase, and continuing into writing the exegesis, I continued to return to these notes to assist with interpretation and maintain fidelity to the original data.

Although I anticipated that I had completed data analysis at this point, it became apparent as I began to read literature relevant to each key theme that in fact, I had not. Reviewing pertinent literature caused me to re-question some of the themes I had settled upon. I returned once again to excerpts from individual transcripts to conduct deeper analysis of participants’ words, especially now that my interpretation was informed by the complete data set. This step resulted in the development of additional themes and some relabelling. All this occurred with the aim of accurately representing participants’ perceptions and lived experience.
3.7 Conclusion

An overview of the methodological approach and method adopted for this study has been described in this chapter. The adoption of a pragmatic paradigm was justified with reference to the use of this paradigm within the clinical context from which this study stemmed. Throughout the data collection and analysis phase of this study, many processes and steps were implemented to ensure the overall strength, robustness, and trustworthiness of the findings, and these have been documented throughout the course of this chapter. The rigour, or accuracy and credibility of research were ascertained for both the quantitative and qualitative methods used in this study. The triangulation design adopted contained some inherent measures of rigour, with the use of both qualitative and quantitative data collection methods aimed at ensuring strength and robustness of results, and thus maximising the credibility of findings (Patton, 2002).

Analysis of qualitative data collected for this study was a lengthy, challenging, engaging and informative process. The process required both discrete excerpts and whole transcripts to be reviewed; analysis and interpretation moved between and across transcripts, entering the textual analysis at varying points – from single word to complete narratives. The themes that emerged from this analysis and their links with contemporary models of cognitive rehabilitation and healthy adolescent social development are, in my opinion, the most interesting and clinically applicable findings from this study. Given this, and the word limit of this exegesis, the remaining chapters present and discuss the qualitative
findings from this study. Quantitative findings are primarily reported in the portfolio via Harry’s and Jack’s case studies (Sections 2.8.1 and 2.8.2) and the second publication contained in the portfolio, which focuses on the Party Planning Task (Shanahan, McAllister, & Curtin, 2011).
Chapter 4
Key themes from participant interviews

Introduction

The mixed methods approach adopted for this study generated a large amount of diverse data. Due to the word limit allocated for the exegesis, this chapter focuses on the qualitative data collected from the participant interviews. The chapter opens, however, with a summary of the last recorded standardised intellectual functioning and language assessment data for Harry and Jack, building upon the biographical data included in the preceding chapter.

The six key themes emerging from the findings of this study form the remainder of this chapter: Development of Self, Bond, Task Relevance, Motivation, Engagement, and Confidence/Competence. The presentation of each key theme opens with an operational definition followed by a discussion of the elements that comprise each theme and reflecting the perceptions reported by Harry, Jack, and their mothers. The elements of each theme are then drawn together in a discussion reviewing the theme in the light of published literature. Throughout the discussion of each theme, literature presented in Chapter 2 (literature review) re-emerges, and the links between this study and existing models of adolescent development, human motivation, and cognitive rehabilitation become apparent. Links between each key theme are also made clear, and all these interconnections are built upon in Chapter 5, the synthesis chapter.
4.1 Harry and Jack: language impairment and its impact on interview participation

The two adolescent participants in this study, Harry and Jack, were introduced in Section 3.4. Building on the biographical data presented in that section, results from the last standardised intellectual and language assessments undertaken by Harry and Jack are presented here in Table 4.1. The standardised assessment data presented was drawn from data acquired during the course of standard clinical practice and was ascertained for this study via an audit of Harry’s and Jack’s clinical rehabilitation files. It was not considered ethically appropriate to re-assess participants on all measures reported in this table for the purpose of this study.

Harry and Jack performed at comparable levels with regard to intellectual functioning, although Jack had superior skills in the PIQ range. Both adolescents presented with reduced language skills on clinical assessment, Harry, again, with the more severe impairment. Interestingly, and in keeping with the often noted discrepancy between clinical and real-world performance following TBI, Harry in fact presented with superior skills in everyday tasks. He experienced a lower frequency of word finding difficulties than Jack, displayed a broader vocabulary, and generally exhibited more refined oral and written language skills as evidenced by sentence construction and cohesion. These observations had been made over years of clinical involvement with Harry and Jack but they were also renewed during the data collection phase of this study.
Table 4.1: Summary of standardised scores for language and intellectual functioning assessments for Harry and Jack

<table>
<thead>
<tr>
<th></th>
<th>Harry (aged 13 years)</th>
<th>Jack (aged 13 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CELF - III:</strong></td>
<td><strong>WISC - III</strong></td>
<td><strong>CELF - IV:</strong></td>
</tr>
<tr>
<td><strong>Total Language score</strong>: 68</td>
<td><strong>FSIQ: 92</strong></td>
<td><strong>Core Language score</strong>: 75</td>
</tr>
<tr>
<td>(severe reduction)</td>
<td>(average range)</td>
<td>(moderate reduction)</td>
</tr>
<tr>
<td><strong>Receptive Language score</strong>: 90</td>
<td><strong>VIQ: 88</strong></td>
<td><strong>Receptive Language score</strong>: 92</td>
</tr>
<tr>
<td>(low average range)</td>
<td>(low average range)</td>
<td>(average range)</td>
</tr>
<tr>
<td><strong>Expressive Language score</strong>: 50</td>
<td><strong>PIQ: 98</strong></td>
<td><strong>Expressive Language score</strong>: 75</td>
</tr>
<tr>
<td>(severe reduction)</td>
<td>(average range)</td>
<td>(moderate reduction)</td>
</tr>
</tbody>
</table>

| **Language Content Score**: 90 | **Language Memory Score**: 82 |
| (average range)               | (mild reduction)           |

**Key:**

- **WISC** = Wechsler Intelligence Scale for Children
- **FSIQ** = Full Scale IQ
- **VIQ** = Verbal IQ
- **PIQ** = Performance IQ

*Total language score and Core language score represent the same measure, an overall measurement of an individual’s language skills.*
The key findings from the qualitative data generated by this study are next presented. Interpretation of data is presented and excerpts from interviews with Harry, Jack, and their mothers are used throughout to illustrate the themes and the comprising elements. Pertinent literature is also woven through the discussion of each key theme so as to ground the findings in existing research and link these findings with both known theories and common clinical frameworks and practice. When appropriate, links between the six key themes are made so that readers can begin to understand the dynamic and interconnected nature of these themes. For ease of reference, Table 4.2 contains an overview of the themes and their elements.
### Table 4.2: Overview of themes identified from interviews

<table>
<thead>
<tr>
<th>Key Theme 1 – Development of Self:</th>
<th>“I have goals, and planned where I wanna be in the future, what I wanna do”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element 1: Identity development:</td>
<td>“they see me”</td>
</tr>
<tr>
<td>Element 2: Individuation and family differentiation:</td>
<td>“it’s gotta be me doing all this stuff”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Theme 2 – Bond:</th>
<th>“And I want to do it because I look up to me boss and I’ve started playing a part now, I know stuff now”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element 1: Mentor/Role Model:</td>
<td>“I look up at me boss”</td>
</tr>
<tr>
<td>Element 2: Sense of team:</td>
<td>“I just like being a part of it”</td>
</tr>
<tr>
<td>Element 3: Co-constructed learning:</td>
<td>“he always comes and grabs me and shows me stuff”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Theme 3 – Task Relevance:</th>
<th>“There were things I didn’t wanna learn [at school] because I knew I wouldn’t need ‘em in life”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element 1: Real-life application:</td>
<td>“what I do in the army I’m gonna be using in like five minutes time”</td>
</tr>
<tr>
<td>Element 2: Task rewards:</td>
<td>“Just see something come out at the end, it just…like ‘Yeah!’”</td>
</tr>
<tr>
<td>Element 3: Contributing to meaningful activities:</td>
<td>“I’ve started playing a part now”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Theme 4 – Motivation:</th>
<th>“It’s not easier, it’s just better. [TAFE’s] harder but ‘cause I want to do it and I want to learn it, but at school I was like, I just didn’t wanna learn anything”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element 1: Verbalising motivation:</td>
<td>“I want”</td>
</tr>
<tr>
<td>Element 2: Creating a better life for one’s self:</td>
<td>“there’s just more to life than just working at the abattoirs”</td>
</tr>
<tr>
<td>Element 3: A secure relational basis:</td>
<td>“I know if I get in trouble with doing this task there’s always someone there that’s gonna help me in all this.”</td>
</tr>
<tr>
<td>Element 4: The need for autonomy:</td>
<td>“I’ve got my own little method that I made up”</td>
</tr>
<tr>
<td>Element 5: Self-efficacy:</td>
<td>“Now I reckon I feel confident to do it by myself”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Theme 5 – Engagement; a multi-component construct</th>
<th>‘But now at TAFE I always put in, always have a say always ask a question and just always want to know’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element 1: Behavioural engagement:</td>
<td>“I just keep going and going”</td>
</tr>
<tr>
<td>Element 2: Emotional engagement:</td>
<td>“even if I’ve had a shit day I’m just still happy”</td>
</tr>
<tr>
<td>Element 3: Cognitive engagement:</td>
<td>“I just watch and I just concentrate”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Theme 6 – Confidence and Competence:</th>
<th>“Probably don’t know how, don’t want to do the oral presentations but when we do it at work or with people we’re in with we do it easily”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element 1: Confidence over competence:</td>
<td>“I feel pretty confident in the army actually”</td>
</tr>
<tr>
<td>Element 2: Competence over confidence:</td>
<td>“I just worry”</td>
</tr>
</tbody>
</table>
4.2 **Key Theme 1: Development of Self**

“I have goals, and planned where I wanna be in the future, what I wanna do”

(Harry)

Development of Self refers to the normal developmental processes of identity development, role development, and gaining independence from the family unit that occur during adolescence. For Harry and Jack it was about the process of moving from the self-perceived negative role and identity of a high-school student to being a valued and contributory member of a team, having opportunities for autonomous behaviour, and developing the skills and knowledge needed to create a *better life for themselves.*

The development of a satisfying, positive, and productive identity was a predominant consideration for Harry, Jack and their parents. This theme is comprised of the normal developmental tasks of identity development, individuation, and family differentiation. Development of Self is presented as the first theme in recognition of its inescapable impact on the perception and development of executive functioning skills in adolescence.

4.2.1 **Identity development: “they see me”**

Identity development was expressed by Harry and Jack as having opportunities to explore their self-perception, contribute to achieving a goal, or demonstrate the requisite skills to independently achieve a self-determined goal that contributed, in some way, to their sense of self. For
both adolescents it was about finding a place to fit and belong. Harry captured this when he said:

In the Army I feel more where I want to be. They see me in the ways that I show, the real side of me, me. It’s just where I feel more comfortable, in the Army, and it’s where I fit.

(Harry)

The desire to create a satisfying identity was reflected in Harry’s and Jack’s perception that academically based tasks did not help them to achieve identity-related goals; such tasks were not considered to be real, and thus failed to help them achieve the normal transition from adolescence to adulthood (Yeager & Bundick, 2009). Harry and Jack considered that their work environments enabled them to develop satisfying identities, indicating a greater fit between those contexts and their self-perception. Harry, for example, was quite definite that the Army was where he “belonged”. He provided insights into how he aligned his identity with the Army more than with any other social network in his life, and how this context created a framework for his identity:

I know if I get in trouble with doing this task there’s always someone there that’s gonna help me in all this. Whereas at school it’s not really structured like that and people at school wouldn’t even help you. [...] It’s an Army thing, civilian versus military people.

(Harry)

A contemporary model of identity development by Holland, Lachicotte, Skinner, and Cain (1998) focused on the important interplay between people’s perspective of their identity and the context in which they find
themselves. They considered identity to be a consequence of the interaction between people, contexts, and practices within contexts, with the aim being to create identities that allow people to belong, to be “part of the story” (McCarthy & Moje, 2002, p. 232 cited in Faircloth, 2009; Faircloth, 2009). The following excerpt from Jack’s interview illustrates how Jack could tolerate a negative exchange with his TAFE (Tertiary and Further Education) teacher because ultimately, he could see that his teacher was helping him become who he wanted to be:

Yeah, like the other day [my TAFE teacher] got up me because I was a bit slower than the other boys were. Um, like there was three questions left and they were, oh they weren’t long but they would’ve took me 10 minutes, but [the other boys] were all going out there to lay bricks so I just writ me thing ‘cause I knew that I would have enough right answers to pass it so I couldn’t be bothered with ending it and [my TAFE teacher] got stuck into me ‘cause he knew I could answer more; but I mean, that’s fair.

(Jack)

Harry and Jack identified that tasks and activities directly linked with opportunities to explore and consolidate an identity were more motivating and, as a result, they were more likely to engage with them. Similarly, a person who supported Harry or Jack to become who [they] wanted to be was more influential, and they were more inclined to attempt or persist with tasks if the outcome helped them to please or impress that adult. It was also more likely that they would be receptive to instructions, coaching, and assistance from that person.
Throughout the interviews with Harry and Jack and their mothers, it was apparent that exposure to their chosen work goal had also exposed Harry and Jack to a “model” of their “possible self”, a term coined by Markus and Nurius (1986). The opportunity to observe and work alongside other people who embodied many of the attributes, skills, and values that Harry and Jack were exploring as part of their identity development, was both motivating and rewarding. Comments from Harry and Jack, such as, “he’s done so much and he’s got so far, where he lives and what he owns and that for how young [he is]” (Jack), and, “after you’ve been in it a while you pick up on things” (Harry), reflect an awareness that they were existing within contexts that were supportive of their possible self. Similarly, both parents showed an awareness that entry into the workforce was supporting their sons’ overall development. Jack’s mum had noticed that he was “making decisions that are better than what they would have been if had he stayed in [his home town] and in part, [she] can thank his boss for that”. Harry’s mum was “well aware that this is who he’d always wanted to be and it’s so nice to see him succeeding at it”.

The ideal self has been recognised for its importance, both as a motivator for future behaviour (as discussed later in this chapter), and as a model from which to evaluate the actual self (Zentner & Renaud, 2007). According to The Theory of Possible Selves, originally published by Markus and Nurius in 1986 (M. G. Erikson, 2007), individuals hold mental representations of “hoped for selves”, or what they would like to become,
and this is contrasted with their “feared selves” (Ylvisaker, McPherson, Kayes, & Pellett, 2008; Zentner & Renaud, 2007). For Harry and Jack, the possible self as an apprentice or member of the military, was far more desirable and motivating than the identity of a student. This hoped for identity served to create the cognitive underpinnings for their goals, hopes, and fears (Ylvisaker et al., 2008).

Comments made by both adolescents throughout the interviews indicated that another marker of attaining a fulfilling identity was an associated sense of intrinsic rewards, or self-actualisation (Maslow, 1987). Harry considered himself to only “be good at the Army” and that within this context he had opportunities to “prove [himself]”; at school he was “not understood”. Jack discussed how his emerging sense of identity provided him with immense satisfaction. This inherent reward increased his confidence in his abilities. Coupled with the positive reinforcement he was receiving from his work colleagues and his skilled performance both at TAFE and within the everyday workplace, these rewards allowed him to think about plans for his future and create a path towards his possible self:

In [my home town] all everyone does is just go to the abattoirs and live in [the town] and then buy the old-people's homes. Well, I thought, “I'm getting out of here. See ya! ” And that's what it was like, it's just stupid like everyone just thinks it's all good but there's just more to life than just working at the abattoirs, getting your pay cheque and then going out on the weekend. Like I went over [there] on the weekend and I loved it, I had fun. Sat around with me mates and it was good, it was just like the old days. But now it's not all I've got, like I'm gonna
go to work. I loved hanging out with 'em and I missed 'em so much, and they're doing heaps of cool stuff just like hanging out and being mates and that, and I still want to be a part of it but I still want to get somewhere.

(Jack)

4.2.2 Individuation and Family Differentiation: “it’s gotta be me doing all this stuff”

In line with developing a personal sense of self, the period of adolescence is also characterised by emerging independence from the family unit and the need to make responsible decisions for one-self. Jack had commenced this process in a very concrete manner by moving away from his family home to live in the large regional centre where his employment was based. From Jack’s perspective, this was a very natural move; he was restricted by not having a driver’s licence when he commenced his apprenticeship and relied on commuting with local residents. This occasionally proved problematic when he was required to commence work early or travel to a work site beyond the regional centre. Jack’s mum made several references throughout her interview that this was a difficult time for her and that she worried “about his ability to protect himself, like not be taken advantage of”. She also spoke about how Jack frequently sought her support and back-up to help him negotiate the rigours of daily, independent living. This included her acting as a distant role model to help him learn the skills needed to operate a household.
I said to him, I mean I didn’t want him to leave home but for him to be able to be at work by seven o’clock every morning, he had to move, but I said to him, “You’re gonna have to start putting money aside, put it away, where you can’t touch it, so you’ve got money for your bills.” He gets a bit slack. Like with his electricity bill, it was $180 deposit and he told [his father] that he was paying it off and he rang the other day and said he got a bill for a hundred and ninety, and it needed to be paid by today. So I put the money in his bank account yesterday and I said, “Now take the bill with you to work, and pay it on your way home from work”.

(Jack’s mum)

Jack did not observably credit his mum with the type of support she reported to be providing. But the examples he gave of how he prepared for work each day indicated being taught systems and strategies by an adult role model.

If I say I’m going to the [pub] “Righto Jack, you’re going to go down the pub tonight, have a few beers with the boys, and come home and go to sleep”. Like I’ll make me smoko, I’ll get me clothes out ready, like I’ll get all that stuff before I even go to the pub. Like I always pack me smoko the night before and like I’ll make sure me washing’s done and just stuff like that, and I’ll always try to make it more easier on meself in the morning.

(Jack)

Jack’s mum was able to acknowledge his emerging independence, and her comments indicated Jack’s developing level of skill. Her comments also alluded to his differentiating himself from his parents as he learned to make personal decisions and act upon them.
He’ll ring me and say, “Mum can you ring Centrelink for me? “ to give him his wages for the fortnight, so they can pay him and I didn’t have to do it the last time he did it himself! I don’t know [what triggered it] cause I rang him and I said, “Mate, did you do your time, your things this fortnight?” and he said, “Yeah” and I thought, “Oh well – done well.” ‘Cause I was waiting for him to ring me. Yeah, he just rings me! Rings me and says, “Mum can you do this?” [But] he’s not relying on me as much and he tends to keep more stuff from me.

(Jack’s mum)

Of course, Jack did not always make positive decisions in the eyes of his mother:

Like I’ve rung him and said, “Oh would you like to come over this weekend? We’re having a bit of a party for one of the little ones for their birthday”, “Oh why didn’t you tell me it was their birthday?” I said, “Jack you don’t have to get them anything just come over.” And he doesn’t.

(Jack’s mum)

Lohman et al. (2007) outlined the process of family differentiation as central to the development of well-adjusted adolescents. Differentiation is the ability of the family to distinguish boundaries between each other and allow each member to have his or her own identity. For an adolescent to individuate and achieve his or her own identity, “families must be able to balance their need to protect their children with their ability to allow them to make some mistakes” (Lohman et al., 2007, p. 5). Harry’s mum’s narrative provided some insight as to how she was grappling with this:
Oh don’t get me wrong, he’s getting better at keeping track of things, but there’s a long way to go! He is pretty good, once I help him set up a system. Mind you, my way is never good enough for him! He has to refine it shall we say! Now that he’s working a bit at the [army] museum and earning a pay packet he’s a lot more careful at keeping an eye on his money, but like with [his sisters] we were pretty clear that once he started earning some money he had to contribute to some of his own costs. The main reason we’ve done that with Harry in particular, was to expose [him] to the skills needed for budgeting and keeping track of bills and all those sorts of things. I didn’t want any of them leaving home and not have some experience of having to be responsible for things. It doesn’t hurt him to experience having no credit on his phone or not having enough money to do everything he wants when he wants, I mean, that’s life isn’t it?!

(Harry’s mum)

Like Jack’s mum, Harry’s mum provided a story of distant and diminishing parental support, but scaffolded support all the same:

It’s so funny to watch him sometimes and the way he sets things up! Like when he’s packing up to go away for example, he sets everything out on the bed so he can check that he has everything before he starts packing. Now I know that I used to deliberately do that in front of him every night when he was a little fella when we were packing his bag for school, and every time we went away on holidays, but I bet he wouldn’t acknowledge that he learnt that from me!

(Harry’s mum)

In keeping with this, Harry readily spoke of being able to prepare himself for army exercises, but from his perspective it reflected his ability to act independently:
Oh, um, going out bush I do all my own planning, like um, alright before we do the setting up in the army like getting all our stuff ready, setting up our pack, I set it up into um, what am I going to take for where we’re going, so we’re going for a two week exercise, right, I’m going to have to take Patrol order, Marching order; we’re gonna be living in the Barracks or something so I’m gonna have to take a wash bag and all this; we’re gonna be out in the field at night, so it’s a cold environment so I’m going to have to take cold clothes, and yeah I’ll go “So, I’m gonna take all this stuff but how do I make my pack light enough that it’s good to march ’round for ages on but has all the right equipment I have so I don’t have a whole heap of stuff?”.

(Harry)

Williamson and Bray (1988) emphasised the need for young people to develop a personal authority, a state that reflects their ability to take growing responsibility for their life. Part of this involves having opportunities to experience self-determination or autonomy, and this concept was prominent in the interviews recorded with Harry and Jack:

H: Well, mainly because I don’t spend it like some other people in this school who just go out on a spending spree, um, I’m always saving money. ‘Cause I wanna by a car, so I’m saving up.
R\(^2\): Good, so you’ve got a goal?
H: Yeah and I also have money management so I, I only spend one-hundred dollars a week so, I know I’ve got money left over.
R: That’s good. So you’ve got a budget.
H: Yep [...] Well sometimes I’ve gone over, like in a certain week then I just spend money the next week so I can make up for it. And I always know I’ve got various money sources coming in as well from the Army.

(Harry)

\(^2\) R = Researcher
The opportunity to experience autonomy has been shown to positively influence motivated behaviour (Ryan & Deci, 2000b), but perhaps more importantly, it has been suggested as a basic psychological need of adolescence (Barber & Schluterman, 2008). Bersonsky and Kuk (cited in Dornbusch, 2000) argued that positive growth in autonomy during adolescence directly influenced personal identity development.

Furthermore, as Harry and Jack exhibited positive autonomous behaviour, their parents could also gradually develop confidence that their sons could act/behave competently, thus fulfilling the process of individuation (Lohman et al., 2007).

4.2.3 Discussion: Theme 1: Development of Self

Research suggests that throughout adolescence young people are concerned with meeting their parents’ expectations but they are also in need of parental assistance in coping with age-related demands (Shulman, Feldman, Blatt, Cohen, & Mahler, 2005). The above quotes from Harry, Jack, and their mums illustrate this and highlight their focus of achieving individuation at this life stage. O’Connor, Allen, and Hauser (1996, as cited in Shulman et al., 2005, p. 582) state that “without the attainment of some degree of independence from parents, combined with continued parental support, emerging adults have difficulties accomplishing the developmental tasks of this transitional stage”. It is argued that individuation is best achieved in a family climate that balances autonomy granting with connectedness (Lohman et al., 2007), but also that an optimal parent-child relationship entails the ability of the child to assert
needs and make personal decisions within the context of empathic parents who can perceive the young person’s needs (Shulman et al., 2005). These elements were observable in the parental support provided to Harry and Jack and, it is hypothesised, contributed to their feeling able to act autonomously and thus extend their skills.

The tone that Harry and Jack used to discuss how confident and competent they felt about their executive functioning skills was inextricably influenced by their self-perception across contexts. Their interviews indicated that the development of a satisfying and pro-social identity, and independence from their parents, were tasks in which they were heavily engaged. Tasks and environments that contributed to identity development and reinforced a positive sense of self were more likely to be engaged in, and the adolescents held a more positive perception of their executive functioning skills when considering tasks and environments that supported their identity and its development. The period of adolescence has long been signified as critical for beginning the development of a well-integrated identity, and as Faircloth (2009, p. 325) stated, “integrating seemingly disparate aspects of the self to arrive at a sense of personal sameness and continuity across time and context, has been proposed as a premier developmental task for adolescents”. Faircloth further noted that this can often preoccupy the adolescent’s energy and attention. This was evidenced, albeit in subtle ways, by both Harry and Jack.
According to The Theory of Possible Selves, people contrast mental representations of themselves and can be motivated to become their desired self and avoid their feared self (Ylvisaker et al., 2008; Zentner & Renaud, 2007). Erikson (2007, p. 348) wrote that the strength of the model was that it drew together “the concept of self, motivation, and the social and cultural-based meaning we use to interpret the world around us”. Environments that exposed Harry and Jack to models of their “possible selves” and provided opportunities to explore their desired identity were more motivating and engaging. This resulted in Harry and Jack having a more positive perception of their EF skills in identity-supporting contexts.

When discussing such contexts, Harry and Jack were more likely to use positive language to convey their thoughts, to indicate a higher level of self-esteem and confidence, and generally to report that they were more confident and competent in such environments. Environments congruent with Harry and Jack’s sense of self resulted in feelings of adequacy, worth, capability, and belonging; as Hill (2009, p. 65) observed, “a sense of belonging is an affirmation of an individual’s cultural identity”.

It must be acknowledged at this point that the development of self also includes role development, a process typified by the adolescent developmental task of determining and settling upon a vocational goal. Role development was paramount to Harry’s and Jack’s perceptions of their EF skills and is a construct shown to influence a number of themes in this study. Role development is specifically discussed in the following
theme, Bond, in acknowledgement of the fact that securing a position within a work team influenced the adolescents’ perceptions of their EF skills.

To summarise this theme, and to illustrate its importance to cognitive rehabilitation, it is worth reflecting on the writings of Ylvisaker and Feeney (2002, p. 66) who captured its key elements:

In our work with children and adolescents who have experienced considerable failure after their injuries, the EF intervention strategies that we have discussed often need to be supplemented by efforts to help the children construct a positive sense of personal identity [...] A productive and motivating sense of self must include a vision of desirable short- and long-term future, but also the hard work and strategic behaviour needed to achieve important goals.

It is critical that rehabilitation clinicians working with adolescents who have sustained a TBI are aware of the normal developmental processes of adolescence. In their review of literature that explored adolescents’ perspectives of educational experiences post TBI, Mealings, Douglas and Olver (2012) noted that identity and sense of self repeatedly influenced students perceptions of returning to and remaining at school. The authors concluded that broadening clinical approaches to “support and enhance factors that assist in the reconstruction of lives” (p. 1175) will better meet the needs of adolescents following TBI. Acknowledging, supporting and assisting in the exploration and creation of positive identities can facilitate adolescents’ development of self, including self-regulatory skills. Similarly,
awareness of adolescents’ needs for individuation and differentiation from their family unit can help determine and focus rehabilitation goals. Part of this is willingness on the clinician’s part to source and collaborate with individuals who serve to act as models of a possible self for adolescent clients, the virtues of which are further explored in the next theme, Bond.

4.3 **Key Theme 2: Bond**

“And I want to do it because I look up to me boss and I’ve started playing a part now, I know stuff now”.  
(Jack)

Abundant research into the components and factors that promote healthy adolescent development has been conducted over the past 20 years (see for example Barber & Schluterman, 2008; Bond et al., 2007; Catalano & Hawkins, 1996; Fredricks et al., 2004). The term “bond” has emerged within this body of work (Barber & Schluterman, 2008). The Social Development Research Group led by Catalano and Hawkins (Social Development Research Group, 2009) identified two interdependent components of this construct of bond: (1) a relational or *attachment* component characterised by close affective relationships, and (2) a *commitment* component characterised by “an investment in the [team’s] line of action” (Catalano et al., 2004, p. 252).
Within this study, the attachment component was exemplified by the relationships of Harry and Jack with identified role models and mentors in their vocational environments. Positive relationships with non-parental adults have been widely identified as a protective factor in the development of healthy, well-adjusted young adults (Barber et al., 2005; Catalano et al., 2004; Catalano & Hawkins, 1996; McKinney et al., 2008; Social Development Research Group, 2009). The commitment component was demonstrated by the desire of Harry and Jack to have a contributory role to their teams’ endeavours and their sense that they could rely on the support of other members of the teams should they need it. In data analysis it also became apparent that the bond an adolescent perceived with a role model and team was facilitated by engaging in the process of experiential learning, which is labelled “co-constructed learning” in this theme, to reflect the collaborative nature of the process. Each of these factors, presented in Sections 4.5 and 4.6 of this chapter, were necessary variables in determining adolescents’ motivation and engagement, and in turn, positive perception of their EF skills.

The elements of “mentor/role models”, “sense of team” and “co-constructed learning” are now each discussed. When combined, these elements highlight the need for a secure relational basis in promoting a positive sense of executive functioning skills in adolescents with TBI. Links between this theme and other key themes of this study are made apparent where appropriate. To close this section, the notion of a bond as a
necessary precursor to motivation and engagement is highlighted before proceeding to the next key theme, Task Relevance.

### 4.3.1 Mentors/Role Models: “I look up at me boss”

All participants reflected on the positive impact of a non-parental mentor and/or role model in the lives of the adolescents. Harry and Jack were able to identify an adult within their work environments who fulfilled this dual role. Parents, too, could acknowledge that starting work had “put [their sons] in touch with” an adult who had a positive influence on them (Harry’s mum). Harry and Jack both identified one person who fulfilled the position of role model; they also indicated that they had multiple mentors. Typically, work colleagues assumed the role of mentor.

A role model was someone who the adolescent looked up to and, as highlighted in the previous theme, someone the adolescent wanted to be like. Jack captured this when he said:

> And I want to do it because I look up at my boss [...] ‘Cause he’s done so much and he’s got so far, where he lives and what he owns and that for how young, like he’s always giving you advice like, “Oh don’t get a loan for your first car” and “Don’t spend heaps of money on cars”, how to buy houses and just heaps of stuff like that. And like every bit of advice he says I always listen to; like even if he’s not talking to me I just listen to what he’s got to say.

(Jack)

A person they considered to be a role model had a broad influence on Harry and Jack, as this person could guide their behaviours and choices as well as providing a template against which to map their emerging
identities. The role of mentor had a teaching component, which served the purpose of supporting Harry and Jack to develop the skills and knowledge needed to fulfil their vocational roles. This generally occurred within an experiential learning framework:

He makes me realise like, what happens in this situation and that. And when I make a mistake he always sits and he always shows me.

(Jack)

Although Jack was more overt in acknowledging the presence of mentors within his work context, Harry alluded to the positive impact of naturalistic, contextualised mentoring, and gave many examples of how he had “just learnt things in the army”. One such example he provided was how he had learned to use a diary to help schedule and manage his time:

I’ve got um like I mark in all the weekends, you know like put in when school’s ending, what’s running, when the courses are running, all this I’ve just learnt from the army.

(Harry)

Relationships marked by authenticity, engagement, and empowerment have been associated with better outcomes for mentor-mentee relationships, and relationships in which the mentor promoted the mentee’s endeavours were associated with greater benefits (Spencer, 2006). Many of the factors discernible in effective mentoring relationships were identified by Harry and Jack as elements they favoured in relationships with their work colleagues. Two important features of the role model/mentor relationships were that the adolescent had respect for
the adult they were working with and that they were appreciative of the
time and effort the adult was willing to invest in their development. Again,
Jack’s interview captured this:

Yeah it’s good ’cause me boss includes me and
stuff. He told me how to do it and stuff. I appreciate
that like I wanna know that stuff. That was so good.

(Jack)

Perceived rewards that stemmed from the relationships between Harry,
Jack, and their role models and mentors were the opportunities they were
given to improve their skill level. Such opportunities were highly
motivating. Harry, for example, realised the value of such a collaborative
relationship:

I’ve worked with our Depot Commander and other
people ’cause they want to put us on an operation
in September next year, so I’ve put down to get,
’cause they want us to get driver’s qualifications for
this vehicle, be a patrol medic, a patrol sig, so I’ve
put down my name for those things; but I’ve also
put into other things I want to do, with other
exercises which is organising around as well, and
I’ve been asking if he can find out information for
when these operations are running and how I can
apply for different things. ’Cause um I’ve learnt that
some people have done a certificate and where
they’ve led down or where it’s [taken them].

(Harry)

Opportunities to move closer to the skill level of their role
model/mentor meant that Harry and Jack could fulfil their job roles,
develop their identities, and demonstrate their attachment and
commitment (bond) to their work and work colleagues. The Social
Development Model (Catalano & Hawkins, 1996) acknowledges that
opportunities for involvement in productive pro-social roles are a key element in protecting adolescents during this phase of development. In line with this, the people who fulfilled the roles of role models and mentors were considered by all participants to be supportive of the adolescent’s overall development. Harry’s mum’s comments reflected a sense of hope that such relationships would help him enter adulthood with mature decision making skills:

I guess in some ways, some of my tensions have eased a little since I’ve met some of the commanders Harry is working with at the army. He speaks so highly of them and would listen to anything they’d say over anyone else! One of the greatest things is that I’m sure these guys won’t let him make silly mistakes. They’re a bit like me in that they expect him to show he can do something well a few times before they’ll let him go on his own. I mean I guess they have to, but at least they’re helping him learn some good skills. I know [school] were good as well, but he just didn’t have the connection with them in the end that he has with these guys.

(Harry’s mum)

It is possible that the sense of hope these relationships gave to parents was a counterbalance to the sense of worry they also had for their sons. Jack’s mum commented that he had “fallen on his feet”, exposing her awareness of the impact and importance of the relationship between Jack and his boss. Both parents commented that they were pleased that their sons had made connections with good people, and in conjunction with the continued support offered by parents, a role model could assist the young men to slowly develop sound self-regulatory skills.
Participants in this study described relationships where work colleagues matched the characteristics documented by Spencer (2006) and other researchers. The collaborative relationships experienced by Harry and Jack were central to ensuring a positive perception of their EF skills and, furthermore, it was this relationship that fostered an attachment and commitment to strengthening the bond they had with a “socialising unit” (Catalano & Hawkins, 1996). Strengthening of the bond at this broader level with a “unit” or team was another feature of the theme of bond within this study, and is now explored.

4.3.2 Sense of Team: “I just like being a part of it”

The presence of a collegial team increased the confidence Harry and Jack felt about their EF skills. For Harry, it meant that he knew his position (or role), but also, that it was acceptable to seek the support of his superiors when required. This was not an experience he identified with school, even though he was aware that a “support team” had been available:

Yeah ‘cause I know, I know there’s going to be someone there [in the army]. ‘Cause part of our three key initiatives are teamwork and mateship [...] and I know if I get in trouble with doing this task there’s always someone there that’s gonna help me in all this and I’ve got a higher chain of command that I can go to with it. Whereas at school it’s not really structured like that and people at school wouldn’t even help you. I thought there was [a team at school] before I went into the army, then I got into the army and I’ve come back and I’ve looked at all the groups that are ‘round, but it’s all, the groups are all splintered, always fighting and bickering each other, you know? How do I really
grow up and be friends with these people? The only real people that I classify as friends or someone I can go to is in the Army itself!

(Harry)

The sense of team also provided a reassuring backdrop for the parents, who acknowledged the impact of team support in building their sons’ self-esteem and confidence. For Harry’s mum, the hierarchical structure of the army created a sense of safety, as he was never “on his own”. This phrase referred to Harry’s physical and also psychological well-being.

He’s just so happy whenever he comes home from exercises and some of the things he tells me he’s done. I wish he could be that enthusiastic around here! But this is what Harry’s always wanted to do, and it is really encouraging to see that the others in the army take him for who he is. I know I can talk to them if I need to, and they have been fantastic in helping him prepare for different hurdles and bits and pieces. There’s no way he’d let them down so it just makes him work that bit harder. [The Commander] there genuinely cares about him, and he cares about what happens there.

(Harry’s mum)

Harry and Jack were both aware of the role and position they held in their respective teams, a concept Jack elucidated:

When we get to a job it's always go put elbows on, set up profiles, and stuff like that. And then you just put a string line on and 'cause there's a couple of us it's never “Oh I forgot to do that”. Cause you have to put ties in and that, and normally, like I always miss it and like 'cause I have to run 'round and put 'em on, like just sit 'em on the line, they drill them in, and yeah it's like you always remember that.

(Jack)
The process of team-role development, or “earning a spot” in the team, was another developmentally appropriate task that Harry and Jack were preoccupied with; it is in keeping with exploring and committing to a work-role and identity as well as creating and experiencing meaningful activity (Eschenfelder, 2005; Yeager & Bundick, 2009). Earning a spot in the team was one way of proving to themselves and others that their chosen career path and associated identity was successful and productive. Remarks such as, “I’m only good at the army” (Harry), and “I’ve started playing a part now” (Jack), reflected Harry’s and Jack’s perception that within these teams, they had skills at a level of sufficient competence that they were valued by others.

A supportive role model coupled with a sense of team created the desire for the adolescents to contribute to the task or goal towards which their team was working. Harry and Jack each expressed a desire to please their mentor by contributing to the task the team was attending to and contributing effectively. For example, Jack used phrases such as “I want to do well” and “I want it to be better”, and Harry expressed that he had “really put down the effort into the army work to get things done”. Being part of a team provided opportunities for Harry and Jack that enabled them to show off their new and emerging skills. Having the opportunity to contribute to the team’s outcome strengthened the bond each adolescent identified toward their superior(s) and fostered a commitment to the team in general.
Research has demonstrated that the sense of a competent and able self lies not only in self-perception but also with the perceptions of others (Hammell, 2004). Role development within a team, then, can be viewed as a component of the self-development that typifies adolescence. Several researchers have explored the importance of being able to contribute to reciprocal relationships that foster perceptions of value and competence, connection, and belonging (Hammell, 2004). Harry and Jack drew on their experiences within the team context and the feedback they received from colleagues to help evaluate their sense of competence as well as sense of self. A primary aspect of the process of team-role development was that it provided collaborative opportunities to build self-esteem by working with others on tasks that were authentic and allowed display of skill.

A sense of team provides guidance, support, direction, challenge, and impetus for development (Rogoff, 1990). The teams in which Harry and Jack participated within their work contexts provided the positive socio-cultural context needed for the development of confidence in their EF skills. However, the process of co-constructed learning was central to the creation and development of such relationships. The nature and process of co-constructed learning strengthened the bonds that Harry and Jack developed with work colleagues, mentors and role models, as discussed in the following section.
4.3.3 Co-constructed Learning: “he always comes and grabs me and shows me stuff”

A key facet of the secure relational basis that was built between Harry, Jack, their mentors and team members, was the use of experiential learning techniques. “Learning by doing, with reflection”, as experiential learning has been described (Gass, 1993; Priest & Gass, 1997, p. 17), allowed Harry and Jack “to be a part of it” (Jack). Both adolescents spoke of the value of hands-on, practical learning:

You do theory first and then you do a practical so like weapons you learn characteristics but you’re also learning at the same time practical hands-on with it, and that makes it easier for me, it’s a good way for me to learn, ‘cause I’m more of a hands-on person. I don’t like sitting down in front of the lecture room, going over notes. I’ve learnt more out at the army than I’ve learnt at school in the short time I’ve been there. I’m learning life skills [out there].

(Harry)

Yeah and [the TAFE teacher] always gives you hands-on. [So] when there’s closed book tests, 'cause I find it difficult to read the question and then think about the answer, well, 'cause it's something I'm familiar with I've got a bit of an idea.

(Jack)

Harry was of the opinion that learning through “real-life” experiences was a distinct advantage of the army compared to the traditional school classroom:
And then I come to school and it’s like “Yeah I know this, I know that and I can do that”. We [vocational studies students] have got some advantages over people who haven’t [had practical experience]. We’ve been there, we know what we’re doing. Like everyone in the school thinks VCAL³ is where all the dumb people go [but] ‘cause we never learnt the theory of how to negotiate, we did it from experience while [the smart people are] learning their theory of how to negotiate, how to present yourself and all of this when they get there they just forget it all and don’t know how to do it and ‘cause we saw it differently [...] we were showing it in a different way, we saw it plainer and that was ‘cause of our experience.

(Harry)

Experiential learning is based on the belief that learning results directly from experience (Newes, 2001). Individuals are placed in situations where it is necessary to employ problem solving or otherwise creative methods of working with the environment at hand to successfully cope with surroundings (Newes, 2001). It was such experiences that were more suited to the learning needs of Harry and Jack than the dialogic experiences of the traditional classroom.

Hands-on instruction, inherent in the process of co-constructed learning, was often the medium that fostered collaborative learning situations for Harry and Jack. Both adolescents spoke of the situated support they received at work and how they valued and appreciated it. Jack, in particular, was aware of the time and effort his boss (“Blocka”) invested in his skill development and learning:

³ Victorian Certificate of Education
Like I might lay a few wrong bricks but then Blocka just goes “Go replace it” or “Come help me with this brick round here” or something like that and I just pull it out and re-lay it, and it's good 'cause me boss includes me and stuff. It's like the other day the bobcat hit [the wall] and like he shows me stuff and he's like “I can't believe [it], have a look what these idiots done”, like “Shit!” and I'm like “What would you do? Do we have to pull it down and start again?” and he's like “Oh nah”, he's like “We'll get the jack and do this” and he told me how to do it and stuff, and like, I appreciate, like I wanna know that stuff, I don't want to just, it's good how [he uses opportunities] to show me stuff. I was just so, that was so good. He might put shit on me but like he, he makes me realise what happens in this situation and that. And when I make a mistake he always sits, he's like “You gotta do” and he always shows me this like, “I don't want that crap in the wall” and he's never, ever like I might be doing something wrong and he's like “Oh you gotta do it like this” just talk to me like he does; most people don't realise but I've always looked at him, like he always comes and grabs me and shows me stuff, he lets me be a part of it.

(Jack)

Through participation in activities with their role model and/or team members, Harry and Jack built requisite skills and, increasingly, developed autonomy within the workplace. Co-constructed learning served to strengthen the bond the adolescents perceived with their role models. This process provided a sense that an adult was willing to invest time and effort into helping them develop skills, and it also helped them to be “where [or who] they wanted to be” (Harry). Thus, co-constructed learning was shown to be a critical process not only in developing a sense of self in Harry and Jack, but also in meeting the identified psychological needs of autonomy and relatedness.
Co-constructed learning made the relevance of tasks apparent and prompted Harry and Jack to identify opportunities for involvement. This engaged each of them in tasks that were perceived to be highly relevant to their identity and role development. Even menial tasks were perceived to be important when they were seen to be a part of Harry’s or Jack’s expected role and had been modelled by their mentor:

When we get to a job it’s always go put elbows on, set up profiles, and stuff like that [...] and normally I’m not switched on with that, like I always miss it and then Blocka’ll be like “Ties, you gotta put the ties on Jack, you’re getting a bit too excited” and so the other day I was like “Yeah, righto I’m on top of it.”

(Jack)

Experiential learning coupled with sense of team created the socio-cultural and interpersonal contexts needed to fuel Harry’s and Jack’s motivation to engage with people, environments, and tasks. Heightened motivation and engagement meant that adolescents were open to constructive feedback, as within this context, they considered the goal of their involvement in a task to be skill development. With this mindset, the adolescents were also able to develop higher level cognitive skills such as planning and organisation, problem solving and self-monitoring. Ylvisaker and Feeney (2002, p. 55) wisely noted that “behaving in a deliberate, self-regulated manner takes time and effort, which are unlikely to be expended if the student sees no pay-off for the special effort”. Jack, not known for “special efforts” in the school classroom was, however, willing to expend the time and effort needed in the “real-life” classroom:
I feel that confident I could just lay anything. Like I love it and I just watch and I just concentrate. I get a bit frustrated but I just, just see something come out of it at the end, it’s just, like the other day at work I was getting big long straight walls and I was like “Yeah!”

(Jack)

At an everyday level, the “apprenticeship model” (Ylvisaker & Feeney, 2009) was more suited to Harry’s and Jack’s learning and development needs. At a broader conceptual level, experiential learning or an apprenticeship model is a common point that starts to draw together the findings of this study with contemporary models of adolescent development, human motivation, and brain injury rehabilitation. Rogoff (1990, p. 6) wrote, “children achieve a shared understanding with those who serve as their guides and companions through explanation, discussion, provision of expert models, joint participation, active observation and arrangement of roles”.

4.3.4 Discussion: Theme 2: Bond

Studies of social development show that students who do not find rewarding experiences and positive relationships at school will seek them elsewhere (Bond et al., 2007); such were the experiences of Harry and Jack. Like autonomy, a secure relational basis in primary relationships has been indicated as a key psychological need of adolescence (Barber & Schluterman, 2008). Furthermore, Bond et al. (2007, p. 357.e316) acknowledged that “learning occurs within the context of relationships” and the importance and impact of co-constructed learning opportunities for Harry and Jack is testament to this.
The link between socialisation and learning has been promoted not only by cognitive theorists such as Rogoff (1990), Ylvisaker and Feeney (1998a), but also by developmental theorists such as Bandura (1986) and Vygotsky (1978), and contemporary child and adolescent researchers such as Catalano and Hawkins (1996) and Barber and Schluterman (2008). These theorists, researchers, and clinicians showed that learning within social contexts affects cognition, behaviour and psychological well-being, to name a few domains: skill areas commonly affected following traumatic brain injury. Repeated analysis of qualitative data accrued during this study showed that the outcome of co-constructed learning was, in fact, four-fold:

a) Co-constructed learning made opportunities for involvement apparent;

b) It served as a vehicle for internalising the team’s values and through this, regulation of behaviour was promoted, as was motivated behaviour;

c) At a practical level it built necessary skills and knowledge by providing scaffolded support. Skill development supported the development of problem solving, planning, and organisational skills, and the adoption of systems and strategies to facilitate these skills;

d) As a consequence of all of the above, co-constructed learning strengthened the bonds of Harry and Jack with their respective teams.
Another way that skill-promoting relationships are seen to benefit adolescents is by enhancing intrinsic motivation (Barber & Schluterman, 2008; Ryan & Deci, 2000b). This is because “the primary reason people are likely to be willing to [engage in] behaviours is that they are valued by significant others to whom they feel (or would like to feel) connected” (Ryan & Deci, 2000b, p. 64). An environment that offers a secure relational basis is one that is supportive of autonomy, creates a meaningful context for action, and provides feedback based on effort. This facilitates self-esteem. Positive self-esteem is a primary psychological variable in determining levels of motivation. Thus, a collaborative, supportive, and meaningful context conducive to creating pro-social bonds is also conducive of enhanced motivation (Barber & Schluterman, 2008; Catalano et al., 2004; Ryan & Deci, 2000a). Thus, Bond is seen within this study as a necessary precursor to motivation and engagement. This relationship is explored further in the key theme of Motivation and Engagement, after consideration of the third key theme, Task Relevance.
4.4 Key Theme 3: Task relevance

“There were things I didn’t wanna learn [at school] because I knew I wouldn’t need ‘em in life”.

(Jack)

This theme represents Harry’s and Jack’s need for a direct link between the skills that were being developed, the knowledge acquired via the task(s) they were engaged in, and their goal/s, identity, and role development. Tasks that were perceived by Harry and Jack as applicable to daily life, which enabled them to develop skills or create opportunities for a 

*better life*, were considered more relevant and therefore meaningful. These tasks were allocated more time and effort, and were persisted with. Tasks relevant to role and identity development were often initially experienced as a consequence of the dynamic bonds that existed with role models and workmates. Similarly, the relevance of a task was often made apparent through the process of co-constructed learning. Like Bond, this theme is also a prerequisite for motivation and engagement.

The elements of Task Relevance – real-life application, task rewards, and contributing to meaningful activities – are now each explored to illustrate the impact of task relevance and meaning on a sense of competence.

4.4.1 Real-life Application: “what I do in the army I’m gonna be using in like five minutes time”

Throughout their interviews Harry and Jack made clear that school had not been an engaging environment for them. One of the primary explanations both participants offered was that the tasks they were expected to complete at school were not relevant to *where they wanted to be*. As Harry said:

---

"what I do in the army I’m gonna be using in like five minutes time"

The elements of Task Relevance – real-life application, task rewards, and contributing to meaningful activities – are now each explored to illustrate the impact of task relevance and meaning on a sense of competence.
Some of the schoolwork we do here is not even relevant and you wouldn’t even use it; like maths, some of the stuff we won’t even use in life, like what I do in the army I’m gonna be using in like five minutes time.

(Harry)

This opinion was echoed by Jack:

There were things I didn’t wanna learn [at school] because I knew I wouldn’t need ‘em in life. Like I used to listen in maths when we did perimeter and area, and I used to listen in to geography sometimes, but then, there were just things that I just didn’t wanna know, and like that’d make me just not wanna be there.

(Jack)

Students in middle to late high school years are ostensibly preparing for life after school, but for some students, the disconnect between the relevance of schoolwork and their career aspirations can create difficulty in finding meaning in academic studies (Yeager & Bundick, 2009). Tasks that had real-life application, that is, held concrete links with personal goals, were those that Harry and Jack were more likely to engage with, persist with, and reap rewards from. Reflections such as the following quote from Jack echoed this:

I never really used to plan me assignments at school. Like I’d just look at it and it'd just be like too big and I just didn’t wanna read it and then I’d just think this isn’t gonna help me be where I wanna be. Like it might give me a Year 10 Certificate but that just wasn’t enough to get me to do it. And now it’s like when I get an assignment at TAFE it’s like “This is worth something to me, this is better than doing something else”.

(Jack)
Jack was able to see the direct relevance of his TAFE studies to his goal of becoming a competent tradesperson. As evidenced by the following quote, the relevant and practical nature of Jack’s TAFE training motivated him to be more engaged with his learning; it also prompted self-confidence that he had the requisite skills to complete an assigned task within this setting:

[Now I feel] that I could do assignments by myself. Like I, I'd be able to, if someone give me an assignment I’d be like “Yeah I'll do that”. Like I wanna do it and I won’t forget about it, as with the [high school] ones [...] just straight out the other ear.

(Jack)

Researchers have shown that engagement in tasks that are personally valued builds feelings of competence, value, and capacity within individuals (Hammell, 2004). The above quote illustrates this and supports the assertion that educational tasks perceived to be applicable to real life, and thus relevant to one’s identity, can be more meaningful and academically motivating. This can lead to increased educational engagement (Appleton et al., 2008; Yeager & Bundick, 2009). During Harry’s interview, he reflected on the benefits he had gained from enrolling in a vocationally oriented curriculum (Victorian Certificate of Advanced Learning) for his final year of high school. He listed it as the “biggest help” in supporting him to “get through school”. Harry stated that without a curriculum that linked to real life he would not have remained at school, but he was now able to acknowledge, “There’s a lot of things that will open up in the army now I have a Year 12 certificate”.

155
Relevant tasks often produced feelings of competence and capacity for both Harry and Jack. Statements such as “[it’s] just so good” (Jack) and “it shows I can do” (Harry), were frequently used to indicate the positive feelings and mindset produced by completing or even just participating in a relevant task. The inherent rewards in tasks and environments that were perceived to be relevant to one’s sense of self served to make even mundane tasks and activities appear attractive and not a “waste of time” (Harry).

4.4.2 Task Rewards:
Harry and Jack described how relevant, meaningful tasks resulted in rewarding experiences. The prospect of a reward be it intrinsic or extrinsic, increased the attractiveness of a task. Some examples of the types of rewards described by Harry, Jack, and their parents are provided in Table 4.4. Intrinsic rewards such as satisfaction and pride were the rewards most commonly spoken about and appeared to be one way the relevance of a task was measured. At other times, tangible, concrete rewards were evident, such as the brick wall or pillar that stood at the end of a day’s work, or a diary system that had been personalised and proved effective.

The Social Development Model (Catalano & Hawkins, 1996), as well as theorists such as Bandura (1986) and Skinner (1993), have all examined the role of reinforcement in shaping behaviour and determining a person’s self-perception of skills. The relevance of a task to personal goals was a predisposing factor as to whether Harry and Jack perceived an opportunity
<table>
<thead>
<tr>
<th>Type of reward</th>
<th>Illustrative quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>Just see something come out of it at the end, it's just, like the other day at work I was getting big long straight walls and I was like &quot;Yeah!&quot; I just get into it, I just love it and then I look at me panel that I've just done and I was just like, &quot;Sweet!&quot;</td>
</tr>
<tr>
<td>Pride</td>
<td>Like we drive around and I see like I bricked the pier, that's gonna be in someone's back-yard, I bricked that window sill, like that's, like I played a part in that person's house; stuff like that, it's just mmm.</td>
</tr>
<tr>
<td></td>
<td>I’ve got my own little method that I made up. I can use my own acronyms [and] that’s another thing I did (shows researcher colour-coded school timetable) so I can remember it. 'Cause that was annoying me 'cause I kept on getting confused, but like this it's easier so history is green so I can see the green and know whether I’ve got history, if it's red I can know whether or not I’ve got VCAL, if it's blue I’ve got English; or if it's black it's a free. It just comes to me, like at the start of the year, first three weeks I was like, I was getting through the first week or so, go to the second week and I was getting confused, so I got the timetable, pulled it out and a coloured pen and just started colouring it in. People were asking &quot;What you doing that [for]?&quot; And it's like, it's easier to read and like people would look and say &quot;How is that easier to read? You can’t even see what you've got&quot;, but I know [my] code.</td>
</tr>
<tr>
<td>Confidence</td>
<td>Oh, um, going out bush I do all my own planning like um before we do the setting up in the army like getting all our stuff ready, setting up our pack, I set it up into what am I going to take for going where we're going, and yeah [I feel] pretty confident actually.</td>
</tr>
<tr>
<td>Sense of purpose</td>
<td>Now that he’s at work I think he organises himself better. He’s got a purpose. Yep. [At school] there was none. He had nothing. Nothing to look forward to; he hated being there.</td>
</tr>
<tr>
<td></td>
<td>And every day that I go to work I, I’m always, like even if I’ve had a shit day I’m just still happy. Like I’m cranky and shit but it’s still so good like some days I get so bored of it and I’m like, “Do I wanna do this for the rest of me life?”, and like I say that but I do, I know I do. Wouldn't wanna sit at home all day.</td>
</tr>
</tbody>
</table>
| Goal attainment | R: You worked really hard last year at making sure you have what you needed to get an apprenticeship; and you worked really hard at getting work experience and getting the work skills that you needed.  
J: And the only reason why I done that is because I didn’t want to be at school. I’d rather go out there and slave all day in the sun than sit in the classroom. Even if I wasn’t getting paid! That’s just what I wanted to do!  
Jack  
I feel quite capable of setting myself a goal and figuring out “this is how much time I’ve got or how much time I’m going to need, these are the things that I need to do”.  
Harry |
| Acceptance | They all know my experience with the head injury and all this, but they see me in the ways that I show, the real side of me, me and so they know it. It’s just where I feel more comfortable in the army and it’s where I fit.  
Harry  
And Bud would [tease me] and Blocka’d be like “Give him a break” and I’d be like “You gotta remember [...] I haven’t had three years’ experience I’ve had six months Bud” and like they understand that, they’re just putting shit on me.  
Jack |
to be relevant, thereby gleaning some reward and reinforcement from it. The more relevant a task, the greater reward(s) it held. An additional reward for Harry and Jack, as discussed earlier, was the opportunity to embed themselves as a valuable member of the work team. This role heralded rewards at vocational, social, and psychological levels. Team acceptance proved to Harry and Jack that they did, in fact, possess skills that enabled them to have a contributory role, and the influence of that is discussed next.

4.4.3 Contributing to meaningful activities “I’ve started playing a part now”

Relevant tasks enabled Harry and Jack to contribute to, or personally effect, a meaningful and purposeful outcome for themselves or their team. The contribution of a “sense of team” to building solid relationships with work colleagues was explored in the theme of Bond. The opportunity to contribute to meaningful activities was a factor that fostered such a sense of belonging and connectedness with work teams. These combined factors persuaded Harry and Jack to have a positive view of their EF skills. Contributing to meaningful activities not only helped build secure relationships, it also directly influenced perceived levels of EF competence. Harry and Jack often spoke with pride of what they had achieved in their work environments and how they felt they were making an impact, something they did not find at school:
I want to learn everything I can possibly learn in the army and I’ve done it. It’s shown to the commanders higher up that this is a soldier that does it and he’s got the ability, he knows what he’s doing.

(Harry)

I’ve started reminding him, like I’ve started playing a part, I’m not just sitting around like I don’t know nothing, I know stuff now. Like we drive around and I see like I bricked the pier, that’s gonna be in someone’s back-yard, I bricked that window sill, like that’s, like I, I played a part in that person’s house; stuff like that, it’s just mmm.

(Jack)

The opportunity to be involved in meaningful activity influenced Harry and Jack’s use of goal-directed behaviours. With the possibility of assuming a specific role within the army unit, Harry talked about how he was working with colleagues to map out a plan to obtain the necessary qualifications and capitalise on the opportunities available to him:

I’ve worked with our Depot Commander [to work out] how I can apply for different things […] like a Patrol Medic or Patrol Sig, so I’ve put down my name for those things; [but given the choice] I’d rather be a medic, ‘cause medic can move on to other things. But sig can lead on to like, other parts of the Army Corp […] Well I could stay with the Army Patrol but become more of a sig, but I want to do both so I get double the chances.

(Harry)

It is not surprising that Harry and Jack were more likely to engage with tasks that held meaning, contributed to identity development, and allowed them to prove their ability to fulfil a role. As Ylvisaker and Feeney (1998a, p. 178) suggested, “meaningful social roles contribute to a positive sense of self as a contributor and generally valuable person”. The opportunity to
contribute to a team outcome ran in parallel with task relevance for Harry
and Jack. A task was often perceived as relevant and thus a rewarding
opportunity if it was also obviously going to contribute to the team’s goals
or desired outcome. Writing from an occupational therapy perspective,
Eschenfelder (2005) proposed that people’s ability to perceive the
relevance of a task to their own goals, needs, and desires influences their
behaviour or reaction toward that task and environment. For both
adolescents, intrinsic motivation was considered an essential component
of involvement in meaningful activities, and the opportunity to be involved
was a primary motivator; it also meant they were likely to have a more
favourable view of their EF skills.

4.4.4 Discussion: Theme 3: Task Relevance

Authentic tasks are likely to enhance engagement with learning.

Meaningful, relevant tasks that offer opportunities to foster or cement a
valued role have been shown to result in higher level engagement
(Fredricks et al., 2004). Within this study, task relevance is postulated to be
a prerequisite need for motivated and engaged behaviour. The need for
tasks to be associated with identity and role development also links this
theme with the Development of Self theme; but the relevance of tasks was
often made apparent through the process of co-constructed learning and
the bonds developed between Harry and Jack and their mentors. Rogoff
(1990) claimed that experiences in which mentees and mentors focused
their joint attention on a task of interest to the young person were potent
learning opportunities. Relevant tasks were those that engaged Harry and
Jack in activities and with people whom they considered to be “worth it” (Jack).

Engagement in meaningful activities has long been known to be central to human happiness and quality of life (Hammell, 2004; Yeager & Bundick, 2009). The concept has been widely explored within the psychology and occupational therapy literature, and underpins contemporary frameworks of rehabilitation (Eschenfelder, 2005; Faircloth, 2009; Trombly, 1995; Yerxa, 1992; Ylvisaker & Feeney, 1998a). Meaningful activities are personally determined, with individual, cultural, and contextual meaning combining to give a level of personal value to the activity (Eschenfelder, 2005). Catalano and Hawkins (1996, p. 155) based their theory of adolescent development (SDM) on the fact that:

> Human beings are satisfaction seekers and ... human behaviour depends upon acts of perceived self-interest. People engage in activities or interactions because of the satisfaction they expect to receive from them.

It is unsurprising, then, that a key factor influencing Harry and Jack’s perception of their executive functioning skills was the level of meaning or personal relevance of the task with which they were presented. They were more likely to engage with a task or environment if they could determine a direct link between this and where they wanted to be in life. Tasks that did not hold the promise of helping them achieve the skills, knowledge, or social standing they were aiming for were considered to be a waste of time. Catalano and Hawkins (1996) postulated that the first construct necessary for pro-social development was perceived opportunities for
involvement. Comments made by Harry and Jack throughout their interviews indicated that they perceived greater opportunities available to them at work. Interpretation of these comments suggests they also perceived these opportunities to be more accessible, in that the task matched their skill level and interest. The Social Development Model details protective factors in the lives of adolescents: opportunity for involvement in productive, pro-social roles; the requisite skills to be successfully involved in these roles; and consistent recognition for involvement in the socialising unit (Catalano et al., 2004). This is perhaps why, opportunities to experience and contribute to meaningful tasks emerged as a key need for Harry and Jack, and why such opportunities persuaded them to have a more positive perception of their EF skills.

With an understanding of the influence of Task Relevance, Bond, and Identity Development in creating a positive sense of EF skills, the fourth and fifth themes of motivation and engagement are next explored.
4.5 Key Theme 4: Motivation

“It’s not easier, it’s just better. [TAFE’s] harder but ‘cause I want to do it and I want to learn it, but at school I was like, I just didn’t wanna learn anything.”

(Jack)

For Harry and Jack, motivation equated to want: wanting to achieve a desired outcome, wanting to create a “better life” for oneself that included a positive role and identity, wanting to please a role model/superior, and wanting to complete a task and gain a sense of satisfaction. As will be discussed in Section 4.6, motivated behaviour resulted in higher degrees of engagement (effort and persistence) and this was actualised by reviewing and modifying behaviour to meet a desired goal or outcome.

Motivation “induces a person to act” (Macquarie University, 2009). The concept of motivation appeared consistently through Harry’s and Jack’s interview transcripts. It was evidenced in a variety of ways, with Harry and Jack describing motivation both as a presence in their everyday activities and as contributing to their ability to visualise future outcomes. Discussion of the theme of motivation is divided into five elements: verbalising motivation; creating a better life for oneself; a secure relational basis; the need for autonomy; and self-efficacy. As the themes of Bond and Task Relevance have already been identified as prerequisites for motivation and engagement, the relationships between all these themes are elucidated, along with the links to self-development (independence and identity).

The themes of motivation and engagement are, in fact, complementary. Therefore, Motivation and Engagement are discussed concurrently, to
illustrate their complementary influences on Harry and Jack and the importance of each construct in creating perceptions of confidence and competence.

4.5.1 Motivation: an introduction

I feel more tired when I have to go to school. When I get into the Army I can stay up for 20 hours a day. And wake up and go and do a week straight, then if I try doing that at school I’m completely dead ‘cause I’m always active in the Army, I’m not active here. School it takes me an hour to get ready, the Army, takes 15 minutes!

(Harry)

But, when I went to school I used to just do it, when I went to school I’d just wake up whenever I wanted to go; when I go to work, I lay there and I just don’t wanna get up but there’s never one time where I've pressed the “snooze” button like, I just can't do it, I just get up straight away! Oh, I wanna do it! But I just get up and away I go. No matter how much sleep or how tired I am I just get out.

(Jack)

These quotes from Harry and Jack illustrate Ryan and Deci’s (2000b) contention that levels of motivation can be influenced by the social conditions in which people develop and function, as well as their orientation or impetus for acting. Ryan and Deci’s Self-Determination Theory (SDT) (Ryan & Deci, 2000b) detailed a continuum of motivation, with the state of amotivation marking one pole and intrinsic motivation marking the other. Harry and Jack described various levels of both states during their interviews, but it was clear that the social-contextual features offered by their work environments produced motivated behaviour. Amotivated behaviour was typically attributed to school. This contrast was captured by Jack when he said:
And like with school I just didn’t want to be there I just wanted to be going home. I always wanted to do something else so that was just time-wasting to me. I hated school. Like I'm glad that I done it and stuff like that and I pulled through but I didn’t wanna be there. At school there were times when we’d watch a movie or we’d read a book or something and then we’d have an assignment on it and I’d be like I didn’t even listen. They’d be talking about some part in this book and I'd be like “Oh yeah, don’t ask me what happened or anything”. Like when we were sitting in class at school the teachers would ask random questions and every kid would put their hand up and have their say and that and I’d never ever, not once in the whole time at school ever put me hand up to say or answer a question or anything or ask a question.

(Jack)

In Jack’s opinion, school offered limited value and reward; it was a context that did not inspire him to participate. Amotivation results from individuals not valuing an activity, not feeling competent to participate in the activity, or not expecting to achieve a desired outcome from participation (Ryan & Deci, 2000b). These were all perceptions of school that were reported by Harry and Jack. Harry spoke of “not caring” about what happened at school, and feeling that attempts to improve his executive functioning skills in this context were fruitless, as he was “bored” and not interested in learning or transferring skills. Such affective reactions, which ultimately result in minimal engagement in the classroom, are typical of amotivated and disengaged students (National Research Council & Institute of Medicine, 2004).
Data collected throughout this study showed that social-contextual features such as positive feedback and rewards for effort, which are elements of the themes of Bond and Task Relevance, created feelings of competence. Again, Ryan and Deci (2000a) postulated that a sense of competence translates to increased intrinsic motivation. When people are intrinsically motivated, that is, engaged in an activity for the inherent satisfaction of the activity itself, they typically show “more interest, excitement, and confidence, which in turn manifested itself as enhanced performance, persistence, and creativity [...] and as heightened vitality, self-esteem, and general well-being” (Ryan & Deci, 2000b, p. 69). Harry and Jack expressed many of these aspects when describing their motivated behaviour and its outcomes. Each of the elements that constitute the overarching construct of motivation is now explored.

4.5.2 Verbalising motivation: “I want”

Throughout their interviews Harry and Jack frequently referred to wanting to be in a particular environment, and conversely, not wanting to be in an environment. Comments such as: “I want to learn everything I can possibly learn in the army” (Harry) and “like with school I just didn’t wanna be there” (Jack) were common throughout both adolescents’ transcripts. A sense of want drove their willingness and ability to engage in tasks within motivating environments. Jack captured this when he said, “Like it’s harder ’cause I want to do it and I want to learn it, I want it to be better”. “Want” also strongly influenced their ability to apply executive functioning skills and strategies as exemplified by Harry’s willingness and ability to organise his time for the things he “wanted to do”: 
But I’ve also put into other things I want to do, with other exercises which [the Depot Commander] is organising around as well, and [I’ve] been asking if [the Depot Commander] can find out information for when these operations are running.

(Harry)

“Wanting”, the desire to be in an environment that met their psychological needs for belonging, relatedness, autonomy, and meaningful activity, was Harry and Jack’s expression of intrinsic motivation. With comments such as, “It’s the only thing I’m good at, the army” (Harry) and “I just want to be the best bricklayer I can be” (Jack), it can be argued that Harry and Jack desired to gratify esteem needs within themselves. In his Theory of Human Motivation, Maslow (1987) proposed that people have a need for a stable, usually high evaluation of themselves, for self-esteem, and the esteem of others. Esteem needs can be classified into two streams: (1) desire for strength, achievement, adequacy, mastery, and competence/confidence, and (2) desire for reputation, status, recognition, and appreciation (Maslow, 1987). In keeping with Maslow’s hierarchy of needs, satisfying these needs motivated Harry and Jack to strive for self-actualisation – the fulfilment of one’s potential. Both Harry and Jack subtly indicated that they had considered this; Jack aspired to “do [his] apprenticeship and do [it] well. Maybe get [his] builder’s licence”, and Harry had “goals, and [had] planned where [he wanted] be in the future”; he talked of being “a medic in the army, ‘cause the medic can move on to other things”.

Maslow wrote, “a want that is satisfied is no longer a want” (1987, p. 18), a statement most relevant to Harry and Jack. They perceived that the school environment did not allow them to fulfil their wants, thus thwarting
the likelihood of meeting their needs for esteem and actualisation. Work environments, however, permitted a view of the possible future and the option to create a *better life*. That is the second element of this theme and is now discussed.

4.5.3 Creating a better life for oneself: “there's just more to life than just working at the abattoirs”

Greater levels of motivation and engagement were associated with environments that held the promise of helping Harry and Jack achieve *better lives* for themselves. Jack, in particular, was clear about how the possibility of obtaining an apprenticeship and having a pathway away from school was in keeping with his self-concept and resulted in intrinsically motivated behaviour:

People come out of school thinking they're gonna walk into this job, 'cause the teachers give you that confidence, they boost you up like you're gonna get this apprenticeship 'cause you've been [at school]. It don't work like that. You gotta get out there and work for someone and you gotta get... it's word of mouth, it's not word of mouth from your school. Like yeah, you mighta been a genius at school but that doesn't mean you're gonna be a good worker... it's whether you wanna be there or not. And the only reason why I [worked hard at getting work experience] is because I didn't want to be at school. I'd rather go out there and slave all day in the sun than sit in the classroom... That's just what I wanted to do! When I started doing work experience that just give me a boost and then it made me feel confident talking to people and then I'd just ring up and ask for a job, and I got knocked back a lot of times just 'cause people had no work and that made you feel like, “Oh nup, I don't want to do this”, like you just wouldn't wanna ring another person but I just kept going and going. 'Cause I wanted [an apprenticeship] I was trying to do it and get it... and I was reading the paper and it come up Bricklayer...
and then it said a second, third or fourth or qualified bricklayer and I just ring him up and I'm just like “Oh, I'm not qualified or a second year or anything but I really, really, really want it, to be a bricklayer but I want to be an apprentice” and he's like “Oh I dunno but give me a ring back later. I'll check if I've got anyone else or not”. And then I ring him back couple of days later and I'm like “Oh I'm just ringing up about that job you've got. I want to come and be your apprentice” and he's like, “Oh yeah, righto”. And I asked me boss not long ago, I said “Why did you give me the job?” and he goes, "Cause you just wouldn’t leave me alone!”

(Jack)

Harry also talked of the opportunities he perceived to be available to him in the army to create the life he desired:

‘Cause um I've learnt that some people have done a certificate and where [that’s] led down or where it’s led [them] and I didn’t wanna go that way. [So] VCAL's been the biggest help for me because it’s not, it’s not school work, it’s like not school work that is set, it shifts along with what I’m in, the army, an apprentice, it’s more flexible I suppose. There’s a lot of things that will open up in the army now I have a Year 12 certificate.

(Harry)

The desire to create a better life for oneself was very much wrapped up in the adolescents’ aspirational identity. Several theories of self-concept consider that what individuals aspire to accomplish with their lives and what kind of person they hope to become are significant elements of motivation (Jutta Heckhausen, Wronch, & Schulz, 2010; Markus & Nurius, 1986). One such theory is the Theory of Possible Selves (Markus & Nurius, 1986), which was presented in the first theme that arose from this study, Development of Self. The theory of Markus and Nurius draws links between self-concept and motivation; the “hoped for” or “possible self”
that Harry and Jack held created the impetus to act in a motivated way.

The allure of more positive and contributory roles, as discussed in the theme of Task Relevance, also served as an incentive for motivated behaviour. Combined, the prospect of creating and achieving a life that was rewarding and congruent with their self-concept was highly motivating. Exposure to people already “living the life” to which they aspired proved to Harry and Jack that their dreams were attainable; but perhaps more motivating was the support they perceived as forthcoming from these role models.

4.5.4 A secure relational basis: “I know if I get in trouble with doing this task there’s always someone there that’s gonna help me in all this.”

A secure relational basis has been shown to contribute to motivational behaviour throughout the lifespan (Jutta Heckhausen et al., 2010). Within this study, as discussed under the theme of Bond, a secure relational basis was evidenced via a positive bond with a role model or mentor and workplace team. These relationships contributed to both intrinsic and extrinsic motivation for Harry and Jack. Intrinsically, the presence of a role model offered an “identity map” for the adolescent to work from, a model of who they could become, and in some respects it reinforced their hope for their future:
Me boss gave me a big talk and he's like “I'm here to make you a bricklayer I'm here to make you a good bricklayer” [...] Like there is some times that I do stuff wrong but, I dunno, Bud said Blocka doesn't go off at me as much as he did at him, and like me boss has stuck up [for me] before 'cause Bud was just getting into me one day [and he's helped me realise] there are more important things than just being a dickhead on the weekends! [...] I just wanna do my apprenticeship and I wanna do well. Maybe get my builder's licence if I can.

(Jack)

Current theories of motivation, such as the SDT (Ryan & Deci, 2000b) and Self-Systems Model (Connell & Wellborn, 1991), postulate that the three innate psychological needs of relatedness, autonomy, and competence enhance self-motivation, mental health, and well-being. Intrinsic motivation is more likely to flourish in contexts characterised by a sense of security and relatedness (Ryan & Deci, 2000a) such as that described above by Jack. The contribution of relatedness to motivation was also evident in the following reflection from Harry:

I thought there was [a team at school] before I went into the army, then I got into the army and I’ve come back and I’ve looked at all the groups that are ‘round, but it’s all [...] I’ve seen a different way of doing things and a much more satisfying way of doing things.

(Harry)

As Harry expressed, it was the knowledge that he had the support and security of a team and more experienced personnel at the army that motivated him to attempt and ultimately engage with tasks. This quote also exemplified the fact that extrinsic motivation was facilitated by the desire to conform to the social and cultural values of the team. As highlighted in discussion of the theme of Bond, a desire to conform to the
values of the socialising unit motivates behaviour (Catalano & Hawkins, 1996). According to SDT, the catalyst for behaviour in many situations is external to oneself, and different levels of self-determination are associated with extrinsic and intrinsic motivation (Ryan & Deci, 2000b). Opportunities for autonomous behaviour were highly motivating for Harry and Jack. These opportunities allowed them to prove their worth to a team and their ability to fit within the socio-cultural context; they also fostered a sense of satisfaction and enhanced self-esteem. Take, for example, Jack’s description of where he fitted with the team and his understanding of the workplace culture:

Well no matter, at work, I’m always wrong. There’s nothing I can do right! And I get told that but it never puts me down, I never feel hurt by it. No matter what I do I’m always wrong and [my boss is] like “Correct, and you always will be!” and ‘cause I back-chat a bit, he got up me the other day and I was just like, “Fair enough” and he’s like, “You need to start learning your position around here” and I didn’t mind that. We have a joke every now and then. Like I’ll go to get something and then I’ll walk back around the corner and he’ll be there and he’ll be like [snoring/ pretending to be asleep] and I’ll be like, “Oh you asked me to do five things at once!” and I just go do it and stuff. They just give me cheek about it. Yeah, that’s all it is.

(Jack)

The developmental need for autonomy is another element of the construct of Motivation within this study, and was highlighted in the initial theme presented in this chapter, Development of Self. Forming a “personal authority”, the ability to increasingly assume responsibility for one’s life, is highly motivating to adolescents (Ryan & Deci, 2000b; Williamson & Bray, 1988) and is the next element of this theme.
4.5.5 The need for autonomy: “I’ve got my own little method that I made up”

Choice and control, or autonomous behaviour, contributed to the levels of Harry’s and Jack’s motivation for a task or activity. Autonomous or self-determined behaviour was one method for the adolescents to demonstrate their increasing individuation from the family unit; this made the prospect of independence highly intrinsically motivating.

Harry and Jack each described experiences that illustrated their desire for autonomy and the sense of satisfaction and pride gained from ably and independently completing a task. Harry described the diary system he had figured out to assist him with day-to-day tasks and appointments, as well as managing his income and budget. He talked with emphatic confidence about the filing system he had set up to manage paperwork and documents. He commented that although his mum had originally set up a filing cabinet for him, he had “modified it to the way he wanted it”. As further testimony to the motivational influence of autonomy, he reiterated this point in the interview:

Yeah, ‘cause I have my own little filing cabinet and army work or certificates I put in one file, bank statements go in bank statements, medical records go into one; yeah it’s my filing cabinet. Mum or dad have done little things but it’s gotta be me doing all this stuff.

(Harry)

Autonomy has been described as “the drive and ability to fulfil personal wants” (Barber & Schluterman, 2008, p. 211). Comments such as: “Well like, I always wanted to do something else so that was just time-wasting to
me. I hated school” (Jack), epitomise this definition. Jack’s need for autonomy was expressed in his desire and motivation to leave school and move into the workforce. The higher levels of effort and persistence he devoted to his TAFE studies in contrast to his high school studies was testament to this and reflective of how motivating choice and control could be for a person:

It’s because I listen in class and I wanna learn. At school there were times when we’d watch a movie or we’d read a book or something and then we’d have an assignment on it and I’d be like, I didn’t even listen. They’d be talking about some part in this book and I’d be like “Oh yeah, don’t ask me what happened or anything” [but] I love TAFE! It’s so much better than high school. Oh it’s not easier, it’s just better. Like it’s harder ’cause I want to do it and I want to learn it, but at school I was, like I just didn’t wanna learn anything. And every time I come back down to TAFE I go back to work knowing a lot more. And now it’s like when I get an assignment at TAFE it’s like this is worth to me.

(Jack)

4.5.6 Self-efficacy: “Now I reckon I feel confident to do it by myself”

Bandura (1982) described self-efficacy as an individual’s perceptions of his or her ability to perform adequately in a given situation (Caraway, Tucker, Reinke, & Hall, 2003). As such, self-efficacy directly influenced Harry’s and Jack’s perceptions of their EF skills, with a positive perception attributed to situations that promoted self-efficacy. Jack’s experiences with his apprenticeship had heightened his self-efficacy and this increased his confidence in his abilities:
I feel that confident I could just lay anything. Like I love it and I just watch and I just concentrate. I get a bit frustrated but I just, just see something come out of it at the end, it's just sweet!

(Jack)

Similarly, Harry’s experiences in the Army had affected his self-efficacy, and he felt “pretty confident in [his] planning and organising skills in the army actually. More confident than anywhere else”.

According to Bandura’s (1982, 1986) social-cognitive theory, perception of self-efficacy impacts on many aspects of a person’s life, including goal orientation and motivation for goal achievement. Again, Jack attributed his greater self-efficacy to contexts associated with his goal of completing his apprenticeship. It is hypothesised that this is because of the positive experiences and relationships associated with these environments:

When it come to assignments and stuff [at high school] there's no way I could've done it myself. Not by myself, I'd a just sat there for five minutes, looked at this big piece of paper with all this writing on it, had my bit a paper, and then just drew a picture and then just like, not going [to do this]. I'd just look at it and I didn’t know where to start, didn’t know what to do, what to write, how to break into it. But now I reckon I feel confident to do it by myself, that I could do assignments by myself and like I’d know how to get into it, I know how to write it but I’d just need a bit of help with spelling. Like I’d be able to, if someone give me an assignment I’d be like, “Yeah I'll do that”.

(Jack)

Self-efficacy influences the way people behave, think, feel, and self-motivate (Bandura, 1986; Caraway et al., 2003). It has been identified as one of the main psychological mechanisms that shapes effort (Williams & DeSteno, 2008). Together with opportunities to engage in meaningful
tasks, as discussed in the theme of Task Relevance, self-efficacy is considered one of the primary factors in generating a sense of competence. When self-efficacy is combined with the other basic psychological needs that were discussed in the themes of Development of Self (the need for autonomy), Bond (the need for relatedness), and Task Relevance (the need for competence), motivation and engagement are produced.

The fifth theme of Engagement is now presented. As per the introduction to Section 4.5, the complementary relationship of motivation and engagement, and the concurrent influences of these two constructs on Harry’s and Jack’s perceived confidence and competence, necessitates a combined discussion of the themes motivation and engagement. Consequently, discussion of Themes 4 and 5 is presented at the conclusion of Section 4.6 rather than including a separate discussion of motivation here.
4.6 Key Theme 5: Engagement; a multi-component construct

“But now at TAFE I always put in, always have a say always ask a question and just always want to know”.
(Jack)

When motivated, Harry and Jack were more likely to be engaged.

Engagement reflects a person’s active involvement in the activity at hand (Appleton et al., 2008). Although a variety of definitions have been provided for the construct of engagement, it is generally considered to reflect the amount of discretionary effort exhibited by someone toward a task or activity (Appleton et al., 2008; Saks, 2006); it is considered to be malleable in response to contextual features, and amenable to environmental change (Fredricks et al., 2004). As such, engagement is as much about the relationships that promote it, therefore demanding a “person-environment fit” (Appleton et al., 2008, p. 379).

Both popular and research definitions of engagement recognise its multifaceted nature, and studies within the past decade have acknowledged three dynamically interrelated factors: behaviour, emotion, and cognition (Fredricks et al., 2004). Harry and Jack provided examples of each dimension: behavioural engagement was evident in their adherence to workplace rules, desire to fit in with routines, and willingness to exert the effort and persistence needed to succeed; emotional engagement was evident in the language they used to describe the affective states different contexts engendered, such as boredom with school in contrast to satisfaction and pride with work; and cognitive engagement was
exemplified in the approach they adopted to learning workplace skills and knowledge in contrast to their limited investment in school-based learning.

Each of these dimensions is now discussed, illustrating the meta-construct of Engagement.

4.6.1 Behavioural engagement: “I just keep going and going”

The amount of effort Harry and Jack invested in a task, and their willingness to persist if at first they did not succeed, was a primary marker of behavioural engagement within this study. Behavioural engagement was most commonly defined in three ways: positive conduct and absence of disruptive behaviour (following rules), involvement in learning (effort, persistence, asking questions, contributing to class), and participation in activities (including going “above and beyond”) (Fredricks et al., 2004). Harry and Jack each spoke in general terms of adhering to the rules of the workplace and the impact of adhering to the rules of the socialising unit, as discussed in the theme of Bond, but it was perhaps the frequent examples of persisting with a goal that best characterised their behavioural engagement. An example of this was Jack’s recollection of the persistent effort he applied to securing an apprenticeship and how he just kept going despite getting knocked back a lot of times. The following quote from Jack best captured behavioural engagement:
There's another big thing. Like when we were sitting in class at school the teacher’s would ask random questions and every kid would put their hand up and have their say and that and I'd never ever, not once in the whole time at school ever put me hand up to say or answer a question or anything, but now at TAFE I always put in, always have a say always ask a question and just always want to know.

(Jack)

In discussing this change in learning engagement, Jack also acknowledged, “I want to do it because I look up at my boss” and “it’s just what I wanna do”, illustrating the influence of Bond and Task Relevance on behavioural engagement. The stronger the bond and/or relevance of a task, the more inclined Harry and Jack were to persist or make an effort to avail themselves of opportunities. Such influences were also evident in Harry’s recollections. He too discussed how he had “put in the time and effort” to capitalise on opportunities offered to him in the army. He noted how this had “shown to the commanders higher up that I’ve got the ability, I know what I’m doing”, thereby mediating his active involvement in set tasks.

Expectancy-Value Theory (Wigfield, 1994) suggests that behaviour change occurs when people value the outcomes their new behaviours afford, and when their self-efficacy is such that they feel they can achieve the necessary changes. As noted by Bandura (1986), knowledge of previous success often translates into judgements of self-efficacy in identical or related tasks. Thus, when individuals feel particularly efficacious in a given domain, they may expend more effort and persist in the face of obstacles (Williams & DeSteno, 2008). This theorised connection was evident in
Harry and Jack’s willingness to engage and persist with tasks in environments that they saw as rewarding and beneficial to themselves. This was opposed to the unrewarding context of school, where Harry and Jack had not been engaged. The emotional reaction of each adolescent when discussing the topic of school was further strong evidence of engagement versus disaffection and the positive momentum that was built through bond, task relevance, and opportunities for self-development. The effect of emotion on engagement is now discussed.

4.6.2 Emotional engagement: “even if I’ve had a shit day I’m just still happy”

Emotional engagement encompasses people’s affective reactions such as boredom, interest, happiness, sadness, and anxiety (Fredricks et al., 2004). Harry’s initial reaction when talking about school made it abundantly clear that this was not an environment that he wanted to be in: “Yeah and I’m only good at the army not at school, I hate school I don’t wanna be here”. Appleton et al. (2008) argued that engagement involves relationships and demands a person-environment fit. This was particularly salient for Harry. When asked what was “hard” about school, he replied: “In the army I feel more where I want to be. Where at school I don’t want to be here”. He explained:

It’s just a waste of my time. You lose, you can lose your concentration like at the start of first period because you’ve got all this boring work to do, most of it you just don’t want to do, and by the end of the day you’re grumpy and shitty and you just wanna get out there.

(Harry)
Jack focused more on the positive emotions he had toward his new work context:

And every day that I go to work, I'm always, like even if I've had a shit day I'm just still happy. Like I'm cranky and shit but it's still so good like some days I get so bored of it and I'm like “Do I wanna do this for the rest of me life?” and like I say that but I do, I know I do.

(Jack)

Theoretical work on values has contributed to the delineation of emotional engagement (Eccles & Wigfield, 2002). This work offers finer distinctions, such as interest demonstrated by enjoyment of an activity; attainment value captured by the perceived importance of doing well on a task for confirming aspects of one’s self-schema; and utility value, represented by the importance of a task for future goals. Work exploring the influence of values also considers “cost” as contributing to emotional engagement, with this capturing the negative aspects of engaging in a task (Eccles & Wigfield, 2002; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). The above quote from Jack captures each of these features.

Like motivation, engagement was considered to exist along a continuum, with different levels of investment or commitment evident (Fredricks et al., 2004). Emotional engagement can range from “simple liking to deep valuing of, or identification with, [an] institution” (Fredricks et al., 2004, p. 61). In contrast to his comments about school, Harry displayed a keen affection for the army, with his emotional engagement deepening to a level that drew in his awareness, and adoption of cultural values:
'Cause part of our three key initiatives are teamwork and mateship; they’re the three values of the army and I know if I get in trouble with doing this task there’s always someone there that’s gonna help me in all this and I’ve got a higher, people up the chain of command that I can go to with it.

(Harry)

Harry’s emotional engagement with the army stemmed very much from the relational basis it offered and his willingness to make a commitment to the army allowed him to “be himself”:

They all know my experience with the head injury and all this, but they see me in the ways that I show, the real side of me, me and so they know it.

(Harry)

Whereas behavioural and emotional subtypes have long been recognised in the construct of engagement, a cognitive subtype has only been added within the last decade (Appleton et al., 2008). Cognitive engagement reflects self-regulated learning (Fredricks et al., 2004), and as such, was an important consideration in examining self-perception of executive functioning skills.

4.6.3 Cognitive engagement: “I just watch and I just concentrate”

R: And that’s what I notice. I said to you tonight, bring along any TAFE work that you’ve got and you tell me "Nah, it’s all under control"!
J: Yeah!
R: This time last year if I’d said to you “Jack, bring along the assignments you’ve got to do for school”, what would you have brought along?
J: (laughs) I wouldn’t have brought along any! But there would’ve been like 10 to do!

(Jack)
As noted in the introductory paragraphs to the theme of engagement, cognitive engagement was evident in the way Harry and Jack approached their vocational training. As discussed under behavioural engagement, effort and persistence were hallmarks of their behavioural engagement, but were also reflected in their commitment to cognitive tasks. Fredricks et al. (2004, p. 64) wrote:

> Whether described as cognitively engaged or self-regulated, strategic students use metacognitive strategies to plan, monitor, and evaluate their cognition when accomplishing tasks. They manage and control their effort on tasks, for example, by persisting or by suppressing distractions, to sustain their cognitive engagement.

Subtle comments from Jack, such as, “I just watch and I just concentrate. I get a bit frustrated but I just [watch]”, demonstrated his ability to inhibit distractions when cognitively engaged. Jack could also reflect on the change in his cognitive behaviour and performance when confronted with tasks that were difficult and challenging but connected with his goal of becoming a good bricklayer. During the data collection period for this study, Jack actively sought my support to complete assignments and written modules for his TAFE certificates. This was discussed during the in-depth interview and Jack recognised that, unlike with his school work, he persisted with these academic tasks and moreover was willing to re-start tasks if his first attempt was unsuccessful:
J: Yeah I stuffed [the TAFE assignment] up. But then I went back. But if I done that in a normal thing and started it and stuffed it up I would’ve just left it. With that I would’ve went back and went through it.
R: Yeah, it shows me that at high school if you’d stuffed it up you would’ve gone, “Oh well I’ve had a go at it, it didn’t work, and that’s it”.
J: Yeah!
R: Whereas this year, what would happen?
J: I’d start again [...] I just wanna do my apprenticeship and I wanna do well.

(Jack)

Greater or more sustained investment in learning alters the types of strategy used, and some literature recognises an association between cognitive engagement and goal theory (Fredricks et al., 2004). Goal theory examines a person’s psychological investment in learning and considers factors such as a person’s commitment to understanding the work or mastering the content. Examples of cognitive engagement provided by Harry and Jack illustrated this link, with an investment in learning evidenced as the identification of “mastery goals” (such as “I just want to be the best bricklayer I can be” (Jack)), rather than “performance goals” (such as: “homework I try to get done as quickly as possible” (Harry)) (Fredricks et al., 2004). Another example of commitment to mastering a skill was Harry’s ability to master the use of a timetable when it was presented as a tool relevant to his vocational goals rather than his educational goals:
R: When we were doing the task last week as we went through it you were figuring out [how to keep track of information]. You were jotting down the time and then who was available at what time. Where did you learn to do that?
H: It was in the army like um, we had a timetable thing, it had people’s names on it, […] what’s going on on the day and where people are going to be in that time of the day.
R: Yep, so you know where they are and what time they’re available. (School bell sounds)
Do you have to go?
H: I have no idea. It’s probably recess. I have no idea. I have a free anyway.

(Harry)

In contrast to his ability to discuss the use of a timetable within the army, Harry could not recall his school timetable and, in particular, whether the bell indicated a change in lessons or commencement of a break; he had attended the school for six years and the bell schedule had not changed in this time. In contrast, his motivation to achieve mastery of activities and skills associated with the army promoted engagement and ultimately skill development. Similarly, Jack’s confidence in his ability to independently complete TAFE assignments exhibited the type of academic achievement that has been shown to be an outcome of engagement (Appleton et al., 2008). For example:

But like I never really, there’s no way I could’ve done [a school assignment] myself. But now I reckon I feel confident to do it by myself. I could do [TAFE] assignments by myself and like I’d know how to get into it, I know how to write it but I’d just need a bit of help with spelling.

(Jack)
Connell and Wellborn’s (1991) conceptualisation of cognitive engagement details three elements: flexibility in problem solving, preference for hard work, and positive coping in the face of failure. Two of these three elements are certainly exhibited in Jack’s comment that “I’m always wrong” at work, but “it never puts me down”, and that he copes by getting on with the job and having “a joke every now and then”. Connell and Wellborn’s (1991) conceptualisation is not dissimilar to definitions of self-regulatory behaviour provided in the human sciences literature and TBI literature (see for example Ylvisaker & Feeney, 2002). Harry and Jack provided examples of their actions and behaviour at work that were interpreted as demonstrating cognitive engagement. This level of engagement occurred when they were sufficiently motivated, through a sense of competence, bond, autonomy, and reward. It was at the point of cognitive engagement that Harry and Jack reported confidence and competence in their executive functioning skills.

4.6.4 Discussion: Themes 4 and 5: Motivation and Engagement

Motivation and engagement have been recognised as innate psychological needs and behaviours (Ryan & Deci, 2000b), with the distinction between motivation and engagement a subject of debate (Appleton et al., 2008). Although separate constructs, as it is possible for a person to be motivated but not engaged in an activity, motivation and engagement are parallel in nature (Appleton et al., 2008). For Harry and Jack, motivation and engagement were tightly linked and it was determined that motivation fuelled by positive relationships, a sense of
meaningful activity, and opportunities to enhance independence, autonomy, and self-identity, led to greater engagement. Engagement resulted in a perception of competence in skills and a desire to enhance and/or refine skills so as to be more autonomous, reap greater rewards, and continue to have positive experiences socially, psychologically, and vocationally.

Motivation has been considered necessary but not sufficient for engagement (Appleton et al., 2008). Skinner, Connell and Wellborn (1990a), and Connell and Wellborn (1991) reported that levels of engagement and the outcomes realised differed as a result of the interactions that occurred within a context, and from the person’s perception that the context met his or her needs for autonomy, relatedness, and competence. Contemporary studies of engagement in the educational and vocational settings allude to an underlying assumption that engagement is the mediator between context and achievement (Appleton et al., 2008; Fredricks et al., 2004; Macey & Schneider, 2008). A robust relationship has been identified between cognitive engagement and both goal orientation and investment in learning (Fredricks et al., 2004). Findings from the present study in fact support the assumption that engagement is the linchpin between context and achievement. A context that is supportive of autonomy, offers authentic tasks that provide opportunities for involvement, collaboration and novelty, and meets the psychological need for bond and relatedness is a context that engenders motivation and, ultimately, engagement. It is this that results in
achievement and, as shown by the findings of this study, it is these features that lead to a positive perception of executive functioning skills and, at times a desire to achieve mastery or competence.

### 4.7 Key Theme 6: Confidence and Competence

“Probably don’t know how, don’t want to do the oral presentations but when we do it at work or with people we’re in with we do it easily” (Harry)

One of the purposes of this study was to investigate how adolescents with TBI perceived their executive functioning skills and to gain additional insights to these perceptions by contrasting them with the perceptions of the adolescents’ mothers. Each of the preceding themes outlined multifactorial constructs that influenced Harry’s and Jack’s perceptions of their executive functioning skills. The presence or absence of each construct had the potential to promote or demote the adolescents’ confidence in their skills.

Confidence is the “feeling or belief that one can have faith in or rely on someone or something” (Macquarie University, 2009); in this study, confidence in oneself. Competence, however, is the “ability to do something successfully or efficiently” (Macquarie University, 2009). This theme contrasts Harry’s and Jack’s perceptions of confidence and competence in their executive functioning skills with their mothers’ perceptions. Like all the preceding themes, it presents data collected via in-
depth interviews with the participants. It also uses a small amount of data collected from Harry and Jack during standardised and ecological assessment tasks, and self-reflection tasks conducted as part of this study. Quantitative data is included in this theme, as opposed to the other five themes, because it helps to illustrate Harry and Jack’s perception that confidence in skills equates to competence in skills. As will be shown, Harry and Jack reported competent cognitive skills via a Visual Analogue Scale (VAS) following a task that measured their planning skills, because by the end of the task they felt confident in the response they had provided. Quantitative data is used in this theme because it highlights the contrast between perceived and measured competence.

This theme encompasses one of the most clinically significant findings of this study. That is, while Harry and Jack were focused on developing confidence in their skills, their mothers were focused on observing competent skill use by their sons. The clinical implications of the different weightings that Harry, Jack and their mothers gave to these two concepts are discussed in the next chapter of this exegesis, but the data that made these differences apparent is presented here. This begins with the emphasis Harry and Jack placed on confidence over competence.

4.7.1 Confidence over competence: the adolescents’ perception: “I feel pretty confident in the army actually”

Harry and Jack were foremost concerned with developing confidence in their skills; self-confidence, the sense that they were successfully able to apply a skill or participate in a task, was required before they could
consider the more complex concept of competence. The need for Harry and Jack to develop confidence in order to develop competence first became apparent when they completed the self-reflection tasks posed after the Party Planning Task (PPT). To recap the methodology used in this task, the adolescents completed the PPT and then completed a VAS recording their levels of confidence and competence related to the PPT. A stimulated recall task in which Harry and Jack were prompted to comment and reflect on their approach, the strategies they used, their behavioural and emotional reaction to the task, and any other relevant features was also completed. Copies of Harry’s and Jack’s VAS responses, with notations showing the time point each mark indicated in relation to the PPT, are provided in Section 2.5.3 of the portfolio. Table 4.5 shows Harry’s and Jack’s reported levels of competence converted to percentages.

<table>
<thead>
<tr>
<th></th>
<th>During the task</th>
<th>At task completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harry</td>
<td>71%</td>
<td>88%</td>
</tr>
<tr>
<td>Jack</td>
<td>40%</td>
<td>86%</td>
</tr>
</tbody>
</table>

The reflective commentary offered by Jack immediately following the PPT illustrated how he perceived confidence and competence to be a unified construct, and consequently, how he perceived his “confidence/competence” with this task:

I reckon that was pretty easy. I didn’t feel confident when I started, but when I finished I felt all right. I mean, if I wasn’t competent I wouldn’t a been able to do it, would I.

(Jack, PPT transcript).
This quote indicates that Jack’s confidence grew once he demonstrated to himself that he was able to attempt the task. Harry also expressed the assumption that competence was inherent in confidence (and vice versa) when he finished the PPT. He said, “Well, I finished the task, and I feel pretty confident with what I did, so I must be competent” (Harry). Although Harry interpreted his sense of confidence to mean competence, a slightly different interpretation to that of Jack, who developed a sense of confidence once he demonstrated to himself he was able to attempt the task, both adolescents’ perceptions of competence were dependent upon their self-confidence needs being met first. These comments indicated that Harry and Jack assumed that completing a task, regardless of the quality of the finished product, equated to competence. Interestingly, standardised data recorded from the TOPS-A and PPT showed Harry’s and Jack’s skills to be significantly impaired, and not at a level considered clinically to indicate “competence” (see portfolio Section 2.9.4). Yet, both Harry and Jack were confident that their attempts at the tasks were adequate, and by virtue of their sense of confidence at the end of the task they judged themselves to be competent.

As discussed in preceding sections of this chapter, the socio-cultural features of the context influenced Harry’s and Jack’s self-appraisals. Socio-cultural features played a significant part in their ability and willingness to consider how confident they felt about their executive functioning skills, with pro-social contexts producing positive self-perceptions. Harry and Jack both reported feeling more confident in their skills when in their respective
vocational contexts. Harry perceived his skill level to be “completely different” between the army and school, reporting that he was “more confident” in using his EF skills in the army “than anywhere else”. Jack also spoke with confidence when reflecting on his executive functioning skills in environments associated with his goal of becoming a tradesperson. For example, he commented that “there’s no way” he could have completed high school assignment by himself, but with TAFE assignments he felt “confident to do it” and he would “know how to get into it”. The enhanced confidence and self-esteem perceived by Jack when contemplating TAFE assignments prompted him to say, “If someone give me an assignment I’d be like ‘Yeah I’ll do that’”. This was a very different level of confidence than he had exhibited at school.

Table 4.6 lists of some of the factors Harry and Jack reported as enhancing their confidence in their executive functioning skills. Their positive approaches to their vocational environments meant that they also viewed outcomes in these settings as positive and thus gained confidence in their skills when such outcomes occurred. Self-esteem is responsive to a person’s “track record” (Koch & Shepperd, 2008, p. 56). A series of successful outcomes, such as those alluded to in Table 4.6, will increase self-esteem as achievement and competence needs are fulfilled (Koch & Shepperd, 2008). Research has shown that in employment settings, a sense of competence influences self-esteem (James, 2010). It is more than likely that similar outcomes (e.g. task completion) were experienced in other contexts, such as school, but were not viewed positively or as creating
confidence in these contexts because of the prior experiences and the consequent attitudinal approaches of Harry and Jack in these less-successful contexts.

Table 4.6: Factors shown to enhance confidence in executive functioning

<table>
<thead>
<tr>
<th>Outcomes that influenced perception of confidence in EF skills</th>
<th>Illustrative quote</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task completion</strong></td>
<td>Harry</td>
</tr>
<tr>
<td></td>
<td>Probably don't know how, don't want to do the oral presentations [at school] but when we do it at work or with people we're in with we do it easily.</td>
</tr>
<tr>
<td></td>
<td>Jack</td>
</tr>
<tr>
<td></td>
<td>Like the other day at work I was getting big, long, straight walls and I was like “Yeah!”</td>
</tr>
<tr>
<td><strong>Sense of contributing to an overall outcome</strong></td>
<td>Harry</td>
</tr>
<tr>
<td></td>
<td>And I've done [it]. It's shown to the commanders higher up that this is a soldier that does it and he's got the ability, he knows what he's doing.</td>
</tr>
<tr>
<td></td>
<td>Jack</td>
</tr>
<tr>
<td></td>
<td>I'm not just sitting back like I don't know nothing, I know stuff now.</td>
</tr>
<tr>
<td><strong>Learning opportunities with mentor or team</strong></td>
<td>Harry</td>
</tr>
<tr>
<td></td>
<td>Yeah 'cause I know there's going to be someone there.</td>
</tr>
<tr>
<td></td>
<td>Jack</td>
</tr>
<tr>
<td></td>
<td>Like I might lay a few wrong bricks but then Blocka just goes, “Go replace it” or “Come help me with this brick round here” or something like that and I just pull it out and re-lay it.</td>
</tr>
<tr>
<td><strong>Inherent level of satisfaction received from a task</strong></td>
<td>Harry</td>
</tr>
<tr>
<td></td>
<td>I've got my own little method that I made up. It's easier. It just comes to me. It helps me work. It makes me more confident.</td>
</tr>
<tr>
<td></td>
<td>Jack</td>
</tr>
<tr>
<td></td>
<td>Like we drive around and I see like I've bricked the pier, that's gonna be in someone's back-yard, I bricked that window sill, like that's, I played a part in that person's house; stuff like that, it's just mmm.</td>
</tr>
</tbody>
</table>
Confidence bred competence, in that confidence fostered increased self-reflection and monitoring of performance and influenced the ability to ascertain what was not working. The application of executive functions in this way was needed to ensure task success and efficiency, the very definition of competence. To develop competence, or even consider this abstract concept, the data revealed that Harry and Jack required four factors, each of which is listed in Table 4.7 along with a quote for illustrative purposes.

<table>
<thead>
<tr>
<th>Factor required to develop competence</th>
<th>Illustrative quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) A base level of confidence in their own skills (this reflects Maslow’s theory where satisfied esteem needs lead to identification of actualisation needs).</td>
<td>I feel pretty confident in my planning and organising skills in the army actually. (Harry)</td>
</tr>
<tr>
<td>b) A level of self-esteem sufficient to allow receipt of feedback about skill development and refinement.</td>
<td>I might be doing something wrong and he’s like, “Oh you gotta do it like this.” (Jack)</td>
</tr>
<tr>
<td>c) A motivating goal to continue to work towards.</td>
<td>I just want to be the best I can be. (Harry)</td>
</tr>
<tr>
<td>d) An attachment to a role model and commitment to the team to facilitate a secure relational basis in which to grow and develop, feel able to make mistakes, and have a “working model” on which to base judgements of self-competence.</td>
<td>Normally I’m not switched on with that, like I always miss it and then Blocka’ll be like, “Ties, you gotta put the ties on Jack, you’re getting a bit too excited”, and so the other day I was like, “Yeah righto I’m on top of it.” (Jack)</td>
</tr>
</tbody>
</table>
These factors created the impetus for adolescents to care about the outcome, and thus, monitor and evaluate their performance, and adjust their performance accordingly to achieve the desired outcome. Ylvisaker and DeBonis (2000) cited similar skills as necessary to be able to successfully complete a task. For example, people need to know that a task might be difficult, set themselves a reasonable goal, initiate goal-directed behaviour, and pay attention to how well they doing so as try another plan if needed.

Newmann (cited in Fredricks et al., 2004, p. 79) theorised:

Engagement in learning will be enhanced in classrooms where the tasks: (a) are authentic; (b) provide opportunities for students to assume ownership of their conception, execution, and evaluation; (c) provide opportunities for collaboration; (d) permit diverse forms of talents; and (e) provide opportunities for fun.

Each of these attributes is represented in the four factors listed in Table 4.7, and each attribute is also apparent across the themes already presented in this chapter. The findings of my study indicate that authentic, autonomy-granting, collaborative, experiential contexts promoted positive self-perceptions in Harry and Jack, and ultimately promoted a sense of confidence in their executive functioning skills. When they felt sufficiently confident in their skills, they could then consider the more abstract, but necessary, construct of competence.
4.7.2 Competence over confidence: the parents’ perception: “I just worry”

Throughout the interviews with Harry’s and Jack’s mums the concepts of confidence and competence also emerged, but in contrast to their sons, both mums indicated competence as the more important of the two. The mums discussed the need to observe their sons competently apply a skill on a number of occasions, ideally in a number of contexts, before having confidence in their son’s ability to reliably apply a skill and independently complete a task. This is reflective of the definition of competence stated earlier, with competence defined as “successful” and “efficient” skill use. It also fits with the notion of competence having a developmental trajectory, with the parental focus on competence matching the more mature cognitive, psychological, and self-esteem profile of adulthood over adolescence.

Each mum’s confidence in her son’s skills, or lack thereof, was frequently expressed as “worry” (Jack’s mum). This was in stark contrast to their sons who frequently described their sense of confidence as a sense of “satisfaction”. Perhaps typical of the worry experienced by the mums, both mentioned how they worried that their sons would not make “sensible decisions” (Harry’s mum). Yet both mums indicated that the connection their sons had developed with pro-social role models through work had somewhat alleviated this concern. Both mums conceded that their sons were exhibiting “better” (Jack’s mum) or, more competent use of planning and organisational and problem-solving skills. However, both parents also
felt their sons continued to need advice and support to competently complete tasks. This was despite recognising a difference in skill level and use by their sons between school and work environments.

A topic that generated a lot of “worry” and illustrated the mums’ focus on competence was moving out of home and living independently. Both mums broached this topic in their interviews without prompting. They acknowledged that, with the transition to work contexts, their sons were demonstrating increased independence and willingness to learn the skills needed for independent living, but they were still concerned about their sons’ abilities to manage tasks of daily living. They worried that their sons would not be able to organise their daily routines and corresponding behaviours. The following quote from Jack’s mum was typical of the concerns raised by both mums: “I worry that he’s not gonna set his alarm, to get up for work. Or forget to pack his lunch or he’s not gonna have enough money to get his lunch or whatever”. Jack’s mum further said: “I wouldn’t worry as much about [Jack’s sister]. She’s talking of moving to Queensland. I wouldn’t worry about her as much because she’s still got adult supervision. Jack hasn’t and Jack still needs to be directed.”

Competence was judged by parents on the basis of skill generalisation and repeated examples of task success. To develop confidence in their sons’ skills and reduce their sense of worry, parents needed concrete examples of competent skill application. The excerpts and corresponding interpretation provided in Table 4.8 show the cautious but evolving sense of competence of Jack’s mum in her sons’ EF skills.
Table 4.8: An illustration of Jack’s mum increasing sense of her son’s competence

<table>
<thead>
<tr>
<th>Quote (Jack’s mum)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now that he’s at work, it’s different.</td>
<td>This acknowledges a developing skill base and increasing parental confidence.</td>
</tr>
<tr>
<td>He rang me back and let me know what happened.</td>
<td>After he had received scaffolded support to increase independence, Jack’s maturity displayed by providing feedback to his mum served to increase her confidence that he was developing competence.</td>
</tr>
<tr>
<td>But he still rings and asks for advice. I try and advise him! And whether he takes that advice.</td>
<td>But Jack’s mum is not yet convinced of his competence and considers he needs ongoing parental/adult support.</td>
</tr>
</tbody>
</table>

Both mums perceived their sons to be capable of effectively using their EF skills for more routine tasks of everyday living. Yet tasks that were new, novel, or complex led the parents to report that the adolescents were somewhat competent but only with parental back-up or support. This was reflective of the scaffolded support needed by all adolescents to develop competent skill use and also reflective of adolescents’ need to receive support to learn new skills (Glang et al., 2008). Harry and Jack were developing their skills of independent living, and although they had their work team and mentor available to support their skill development in the work context, they still needed their parents to fulfil this role in the home and independent living context.

4.7.3 Discussion: Theme 6: Confidence and Competence

The traits and states of confidence and competence are inextricably linked with those of self-esteem, self-efficacy, competence, and self-concept. Belief in one’s competence has been shown to be a mediator of
actual achievement. According to Jacobs, Lanza, Osgood, Eccles, and Wigfield (2002, p. 509), “children perform better and are more motivated to select increasingly challenging tasks when they believe they have the ability to accomplish a particular task”. Jack’s comments and self-rating following the PPT is an example of this. He reported a high level of self-confidence and by default, competence, with this task once he realised he was able to make a reasonable attempt at it.

Within Harry’s and Jack’s day-to-day lives, contexts that were supportive of autonomy and that offered relevant tasks played a large part in fostering their self-competence beliefs. Comments made by Harry and Jack in the interviews, such as, “[If I stuffed it up] I’d do it again,” and conversely, “I hate school, I don’t want to be here, school’s hard”, reflected their desire for a competent skill base; but self-confidence was affected by the context which, in turn, affected their belief in their competence. This relationship between context and self was explored in Theme 1 (Development of Self), and both Theme 1 and this Theme 6 support the notion that Harry and Jack required sufficient self-confidence before focusing on competence. The majority of comments made by Harry and Jack about school reflected their perception that school was not a context that offered experiences that built confidence or competence. As has been well noted by now, their vocational contexts provided the opposite. These contexts met their needs.
The adolescent psychological needs of autonomy and relatedness, and the influence of these needs on confidence, were explored in previous sections of this chapter (e.g. Sections 4.2.2, 4.5.2 and 4.5.5 for discussion of autonomy, and 4.3.4 and 4.5.4 for discussion of relatedness). In sum, contexts that met the basic psychological needs for autonomy, relatedness and confidence allowed Harry and Jack to move on to consider the more abstract and complex concept of competence. Eccles (cited in Jacobs et al., 2002) suggested that perceptions of competence are likely to be related to increased interest and value for an activity; this may lead children to spend more time on the task, improve their skills, and result in greater long-term engagement over time (Jacobs et al., 2002). This was certainly the pattern described by the participants in this study.

Apart from the influence of interest and value in a task, competence also has a developmental component. Researchers have shown that self-competence is closely associated with self-esteem (A. Hughes, Galbraith, & White, 2011). Self-esteem is one of the most studied areas in social sciences (Bachman, O'Malley, Freedman-Doan, Trzesniewski, & Donnellan, 2011; Rudolph, Schroder-Abe, Riketta, & Schutz, 2010). Rosenberg (1965), who was responsible for pivotal works that defined and measured self-esteem, identified it as “the amount and type of personal respect and worthiness” (Babington & Kelley, 2009, p. 132) with which people view themselves in comparison with others. Self-esteem is influenced by a person’s self-concept and self-efficacy, and researchers consistently illuminate a dynamic relationship between these psychological traits, with
perceived competence being the common link. The self-concepts of Harry and Jack, that is, their *possible self* as described in Themes 1 and 4 (Sections 4.2.1 and 4.5.3) directly affected their self-esteem. Their self-esteem was dependent on their psychological needs of autonomy and relatedness, and their ability to develop their sense of confidence, in various contexts.

It is now well documented that self-esteem changes over time (Jacobs et al., 2002). Although it is relatively high in childhood, as children’s cognitive skills begin to develop they “begin to base their self-evaluations on external feedback and social comparisons” (Robins & Trzesniewski, 2005, p. 159). Coupled with the developmental expansion of executive functioning skills as described in Chapter 2, competence and the ability to judge it are skills that develop through adolescence into adulthood. That developmental progression explains the different perceptions and weighting of confidence and competence by Harry and Jack and their mothers. There is a “tendency for competency perceptions to become more multidimensional with age” (A. Hughes et al., 2011, p. 288).

Understanding that perceiving, valuing, and judging competence has a developmental component explains, in part, why Harry and Jack’s mums were more focused on their sons’ level of competence, whereas Harry and Jack were more focused on building their self-esteem and confidence.

According to Hughes et al. (2011), a person’s self-esteem and self-efficacy develop as a more cohesive overall self-concept is formed. The evolution of self is reliant on the gradual development of self-esteem and
self-efficacy, led by development of self-confidence and belief in one’s competence. Hughes et al. (2011) also asserted that perceived competence influenced the psychological states of self-concept and self-efficacy, but in different ways. The confidence elements of self-efficacy ask “can I?” questions (“can I do mathematics?”), whereas the competency elements of self-concept ask “being” questions (“Am I good at being a...?”, “Do I fit with/belong ...?”). Harry and Jack both displayed high levels of self-efficacy at the completion of the PPT as well as in the vocational tasks they discussed during their interviews, and these levels were converted to high cognitive and affective perceptions of their competency. The mums’ perceptions of Harry’s and Jack’s self-efficacy, however, were lower, and they were more focused on self-concept, resulting in the difference of opinion with regard to confidence and competence. That is, Harry and Jack evaluated their performance from an efficacy basis (believing they could complete a task), whereas their parents evaluated performance from a self-concept basis (looking for a “way of being” rather than a one-off outcome).

The common question asked of all participants in this study was, “How confident and competent do you feel in your/your son’s executive functioning skills?” Unlike all preceding themes, which captured and described the socio-contextual features that influenced perceptions of executive functioning skills, and in particular, the factors that influenced confidence and competence in these skills, this theme describes the level of importance adolescents and their parents attributed to these two
concepts. It answers the unanticipated question of this study: which is more important, confidence in executive functioning skills or competent executive functions skill use? The differing answers to this question capture the different foci of Harry, Jack, and their parents for involvement in rehabilitation, and indicate the need for rehabilitation clinicians to consider both foci when devising rehabilitation goals and programmes. It is suggested that adolescents need to build confidence in themselves and their skills; parents need to know that their adolescents possess a competent skill base.

4.8 Conclusion

The key findings that were revealed from the qualitative data of this study were presented in this chapter. The six themes illuminated how confident and competent Harry and Jack felt about their executive functioning skills and in Theme 6, *Confidence and Competence*, these perceptions were contrasted against their parents’ perceptions. These themes helped to address the purposes of this study, which were to investigate how adolescents with TBI perceived their executive functioning skills and to gain additional insights by contrasting these perceptions with those of their mothers. The qualitative findings indicated that the adolescents with TBI had varying perceptions of their executive functions depending on the context in which they were situated and their ability to meet their needs of *identity development and individuation*, *secure relational basis through the presence/absence of a role model or mentor*, *task relevance*, and *real-life application*, all of which drove their motivation.
and engagement. The elements of each theme were explored and pertinent literature was incorporated via discussion of findings at the conclusion of each key theme.

The next chapter takes much of this discussion and expands upon it. The findings presented here are synthesised with existing theories, models, and frameworks from the fields of TBI rehabilitation, adolescent development, human motivation and engagement, and learning and cognition. The Ripe for Rehab Framework, an attempt to translate the findings of this study into a clinically useful and applicable tool, is presented in Chapter 5. The directions for future research and concluding remarks are presented in Chapter 6, concluding this exegesis.
Chapter 5
Synthesis of findings

Introduction

The previous chapter presented the key themes of this study. Illustrated across these themes was the fact that Harry’s and Jack’s confidence and competence in their EF skills was influenced by their development of self, bonds with non-parental adults, and the relevance of tasks to their goals. Settings that supported these developmental needs promoted Harry’s and Jack’s levels of motivation and engagement. Greater motivation and engagement fed greater self-confidence and self-esteem, and it was when Harry and Jack sensed heightened self-worth that they perceived, or were able to report, self-competence. The presence or absence and dynamic interaction of each of the themes and their constituent elements in particular created situations that either satisfied or denied Harry’s and Jack’s needs for autonomy, relatedness, and competence.

Through the presentation and explication of a clinical practice framework, the Ripe for Rehab Framework (R4RF), this chapter synthesises the findings of my study with key theoretical practice frameworks and models. It showcases how the findings of this study have been translated into a clinically applicable tool, and how development of the tool has followed a process so often used in everyday clinical practice: the integration of theory, clinical knowledge, and clinical skill. The qualitative
data analysis methods used within this study allowed and encouraged the process of repeatedly returning to the literature and study data to develop a deep and rich understanding of the perceptions expressed by the study participants. The cyclical nature of the analysis process allowed integration of theory, study findings, and clinical practice to occur. Repeatedly turning to and searching literature uncovered a variety of evidence that supported my interpretations of the data. More specifically, the key findings of the study were shown to resonate strongly with several theoretical models: the Social Development Model (SDM) (Catalano & Hawkins, 1996), Self-Determination Theory (Ryan & Deci, 2000b), Contextualised Rehabilitation Framework (Ylvisaker, 2003), and writings that discussed engagement as a multi-dimensional construct (for example, Connell & Wellborn, 1991). When combined, these models and frameworks created a solid theoretical basis for the framework for practice that is ultimately proposed in this chapter. To demonstrate this, and to show how study findings and literature have been synthesised through the course of this study to develop the R4RF, pertinent literature is discussed in this chapter, building on the review of literature presented in Chapter 2 and discussion of themes in Chapter 4. Returning to the literature to support clinical reasoning in this way is reflective of the iterative approach taken in this study.

A detailed description of the R4RF opens this chapter. In the following section, the elements that constitute each part of the framework are described. This begins with a review of self-esteem and presents it as the
point of articulation between the contexts of development, activity, and interpersonal relationships, and self-perception of confidence and competence in executive functioning skills. A synthesis of the study findings, existing theoretical and rehabilitation literature, and my acquired clinical knowledge and skill is then provided, along with the clinical implications of the study. This chapter addresses the core objective of professional doctorate studies “to advance professional practice through critical review of the literature, critical reflection on current professional practice, and the discovery of new knowledge or the application of knowledge to professional practice” (Wheat, 2007, p. 5). The clinical contributions and limitations of this study conclude this exegesis in Chapter 6.

5.1 The Ripe for Rehab Framework

The R4RF details the factors necessary to produce increased levels of motivation and engagement in cognitive rehabilitation from adolescents with TBI. It outlines the contextual features that clinicians should consider when designing, reviewing or evaluating rehabilitation programmes for adolescents with TBI. Ryan and Deci (2000b, p. 68) commented, “humans can be proactive and engaged, or alternatively, passive and alienated largely as a result of the social conditions in which they develop and function”. Ryan and Deci further stated that research guided by Self-Determination Theory (SDT) can ascertain the conditions that “foster versus undermine positive human potentials [...] and contribute to [...] the design of social environments that optimise people’s development, performance and well-being” (p. 68). The R4RF is an attempt to do just
that, within the field of adolescent TBI rehabilitation. Rather than a prescriptive framework used rigidly, the framework is designed to prompt clinicians’ thinking about the contexts they are or could be using when working with adolescents with TBI. Using the R4RF can encourage clinicians to consider:

- factors such as typical adolescent development, and the impact of identity and self-development on an adolescent’s motivation and engagement with cognitive rehabilitation;
- the need for authentic, meaningful tasks and activities when rehabilitating cognitive and executive functioning skills;
- the need to ascertain who are, or who could be, non-parental role models and mentors within the lives of the adolescents, as interpersonal bond was shown to be one of the most influential factors on how adolescents viewed themselves and their EF skills; and
- the breakdown of core environmental features when designing and reviewing rehabilitation programmes for adolescents with TBI, to ensure that appropriate social, developmental and activity supports are in place for each adolescent.

Within the R4RF, the core environmental features articulated by Harry and Jack as having the greatest positive impact on their executive functioning skills are arranged as three interconnected contexts. These contexts were identified in response to the synthesis of the findings of this
study with the SDT, SDM, SSPM, and contextualised rehabilitation framework. This synthesis led to the realisation that Harry’s and Jack’s primary psychological needs were to feel well supported, to be provided with activities that promoted a sense of confidence, and to be provided with opportunities for autonomous action. These three innate psychological needs were incorporated into the R4RF within the:

- interpersonal context, to address the need for a secure relational basis;
- activity context, to address the need to experience meaningful activities that build competence; and
- development context, to incorporate adolescents’ need for autonomy.

It is hypothesised that if clinical programmes promote and meet these needs, then adolescents with TBI will be more likely to engage in cognitive rehabilitation.

### 5.1.1 Reading the Ripe for Rehab Framework

The R4RF (Figure 5.1) is designed to be read from left to right. Although it is natural then to read the components from top to bottom, they are not placed in any particular order or hierarchy. The first three boxes capture the three contexts that warrant consideration when seeking to engage adolescents in rehabilitation. These three boxes describe the desired factors that enable adolescents to hold a positive perception of their EF skills.
Each context (interpersonal, activity, or developmental) captures specific or combined elements of the themes discussed in Chapter 4. For example, the Interpersonal Context highlights the need to consider the relationships that exist within an environment, but also the importance of using co-constructed learning as a medium for building secure relational foundations; the Activity Context also requires consideration of co-constructed learning, but within this context it is from the perspective of scaffolded skill development through contextualised instruction and using meaningful activities of optimal challenge. The Developmental Context incorporates the elements of identity development and individuation taken from Theme 1 (Development of Self), and the psychological need for self-determination, which emerged in Theme 4 (Motivation).

The findings from my study show that when the three contexts work effectively, adolescents with TBI are more likely to view their EF skills positively, be more motivated and engaged, have greater levels of self-esteem and confidence, and seek support to develop skills so as to move from being “able” to being “competent”. Ultimately, this prompts an awareness and desire to improve their EF skills. The findings from my study indicate that when the interpersonal, activity, and/or developmental contexts were effective, adolescents were ripe for rehab. This is in line with Rogoff’s (1990) suggestion that cognitive performance needs to be considered “in light of task characteristics, [...] the goal of the activity, and its interpersonal and sociocultural contexts” (p. 6). Using the R4RF
encourages clinicians working in adolescent TBI rehabilitation to also consider these aspects.

Following Sections 5.2 and 5.3 of this chapter, which discuss the integral role of self-esteem in Harry and Jack perceiving confidence and competence in their EF skills, the R4RF is explained in reverse, starting with a discussion of motivation and engagement. This discussion highlights how fostering these behaviours promoted a sense of confidence and competence, noting how such behaviour was reliant on the capacity of environments to provide contexts that positively supported Harry’s and Jack’s interpersonal, developmental and activity needs. The ensuing sections discuss the R4RF and are headed with a graphic showing which part of the R4RF is being discussed. The purpose of this is to orient readers to the elements of the R4RF under discussion and the sub-elements that constitute each key part of the R4RF.
Figure 5.1: The Ripe for Rehab Framework

- **Interpersonal Context**
  (meets the need for a secure relational basis)
  - Bond
  - Co-constructed learning

- **Activity Context**
  (meets the need for authentic, meaningful activity)
  - Task relevance
  - Contextualised Instruction
  - Meaningful activities of optimal challenge

- **Developmental Context**
  (meets the need for development of identity and autonomy)
  - Identity development
  - Process of Individuation
  - Opportunities for self-determination

- **Internalised & integrated motivation**
- **Behavioural and emotional engagement**
- **Cognitive engagement**

- **Self-esteem**
- **Confidence**
- **Sense of competence**
5.2 Perceiving confidence and competence in executive functioning skills

The findings of this study indicate the developmental, environmental and psychological factors that influenced Harry’s and Jack’s perception of confidence and competence in their executive functioning skills. The key themes illustrated how Harry and Jack needed a setting to allow them to engage in tasks that supported development of self-esteem. Settings needed to offer supportive relationships, meaningful tasks and an obvious link with personal goals in order to fuel motivated and engaged behaviour. Settings that met these needs resulted in intrinsically motivated behaviour and engagement at cognitive, behavioural and emotional levels. When engaged across these multiple domains, Harry and Jack had greater self-esteem, felt more confident, and judged themselves as competent. The perceptions and stories relayed by Harry and Jack throughout their in-depth interviews indicated that self-esteem was a pivotal influence in their assessment of self-confidence and competence.

Self-esteem, the sense of personal worthiness (Babington & Kelley, 2009), was fed by environments that met Harry’s and Jack’s needs for autonomy and relatedness and that had congruence with their sense of self. Through increased self-esteem, Harry and Jack felt higher levels of self-confidence and ultimately competence. Theme 6 (Confidence and Competence) discussed the differing perceptions Harry, Jack and their mums had of confidence and competence in Harry’s and Jack’s executive functioning skills. The theme illuminated how self-competence and the ability to judge it has a developmental component, and it is proposed that
this was a reason for the different priorities Harry, Jack and their mums allotted to confidence and competence. Perceiving or judging competence in their executive functioning skills was, in fact, the final stage of self-evaluation for Harry and Jack. They were more invested in building their confidence in conjunction with their self-concept, self-efficacy and emerging identity. Harry and Jack were unable to consider competence until they felt adequately confident and when the activity, interpersonal, and developmental contextual features of the environment in which they were engaged supported their development of self and all the aspects of development associated with that process.

Within the R4RF, self-esteem serves as the conduit between motivation and engagement and the contextual features that promote these states, and perceived confidence and competence in one’s EF skills. Throughout the findings of this study the importance of self-esteem in Harry’s and Jack’s perception of their EF skills has been apparent, and it is why self-esteem is considered the linchpin between perception of EF skills and the contexts that promote confidence and competence in these skills.
5.3 Linking environment and outcome through self-esteem

The R4RF captures the dynamic relationships of an environment: its component contexts and the influence of these on personal motivation and engagement, and the impact of those relationships on an adolescent’s ability to perceive a positive sense of self-confidence and competence.

Self-esteem is indicated as the first state affected by motivation and engagement. Although the R4RF depicts this relationship in a linear fashion, there is a cyclical or co-dependent relationship that exists between motivation, engagement and self-esteem. Self-esteem is a primary psychological variable in human motivation. It has been shown within this study to have a bi-directional influence, being influenced by contextual factors such as the meaningfulness of tasks and relationships with mentors and role models, while concurrently influencing perceptions of self. Koch and Shepperd (2008) noted that feelings of social inclusion and competence both contribute to self-esteem. Motivational theory hypothesises that a sense of competence translates to intrinsic motivation, and one way intrinsic motivation manifests itself is as enhanced self-esteem (Ryan & Deci, 2000a, 2000b). In their original work that proposed

---

217
two dimensions to self-esteem, Tafarodi and Swann (1995) emphasised “two kinds of motivational strivings in human development; the need to know ‘who we are’ and ‘what we can do’” (Ramsdal, 2008, p. 334). They asserted that “when intentions and results correspond, and this correspondence can be seen as caused by one’s actions, then self-competence will be increased” (Ramsdal, 2008, p. 334). It is not surprising, then, that self-esteem serves to link the psychological needs of autonomy, relatedness and confidence with a person’s sense of competence; nor is it surprising that when an environment fostered the right interpersonal, activity and developmental contexts for Harry and Jack, they exhibited more intrinsically motivated behaviour, multi-dimensional engagement, and reported a greater sense of confidence and competence in their EF skills. The findings of this study showed that environment was linked with outcome through self-esteem.
5.4 Building self-esteem – the role of motivation and engagement

Self-esteem has been reported as being responsive to a person’s “track record” (Koch & Shepperd, 2008, p. 56) and as the “relationship between aspirations and success” (Ramsdal, 2008, p. 334). Accordingly, a series of successful outcomes such as those experienced by Harry and Jack in their workplaces will increase self-esteem as achievement and competence needs are fulfilled (Koch & Shepperd, 2008; Maslow, 1987). Successes for Harry and Jack came in several forms, such as earning a spot in their work team, constructing a brick pillar or establishing a filing system, and learning new skills and knowledge in collaboration with their mentors. The combined effects of experiencing success in their relationships and day-to-day tasks contributed to Harry and Jack experiencing a successful sense of self. Everyday successes, which were more prevalent in their workplace than school environs, built a positive sense of self and enabled Harry and Jack to experience satisfaction of the typical needs of adolescence:
autonomy, relatedness, and confidence. As these needs were supported,
Harry and Jack exhibited more motivated behaviour and greater
engagement with person, place and task; this in turn enhanced their self-
esteem. The culmination of this multi-faceted and dynamic process was
perceived confidence and competence in their executive functioning skills.
Without an environment that met their basic psychological needs, Harry
and Jack were not motivated or engaged and could not report confidence
or competence in their skills. This multi-dimensional relationship was used
to develop the R4RF.

5.4.1 The role of motivation
Motivation and engagement were promoted or diminished in response
to the environment’s capacity to meet the psychological needs of
competence, autonomy and relatedness. Facilitating motivation and
engagement was central to enhancing Harry’s and Jack’s self-esteem and
triggering enhanced perceptions of executive functioning. Harry and Jack
described motivation as want, their desire to achieve a successful sense of
self, create a better life for themselves, consolidate a bond with a role
model or mentor, and achieve the developmental process of individuation.
Motivated behaviour, particularly intrinsically motivated behaviour,
generated the effort and persistence (engagement) needed to realise their
goals. Intrinsically motivated and engaged behaviour manifested itself as
goal-directed behaviour, the application of EF skills. As a practice
framework, the R4RF specifies the need for clinicians to consider if an
adolescent is experiencing intrinsically motivated and engaged behaviour
within a given setting, as the consequences are beneficial to rehabilitation efforts and general adolescent well-being.

The SDT articulates a motivational continuum and proposes that when people are able to internalise and integrate the values, beliefs and behavioural regulations of their social group, “greater persistence, more positive self-perceptions, and better quality of engagement” are realised (Ryan & Deci, 2000a, p. 61). In describing the SDT, Ryan and Deci (2000a) acknowledged that many of the activities prescribed at school were not intrinsically motivating for students, and often the same could be said of many standard cognitive rehabilitation tasks. Ryan and Deci noted that a “central question concerns how to motivate students to value and self-regulate such activities, without external pressure, to carry them out on their own” (2000a, p. 61). Their solution was to foster internalisation and integration of values and behavioural regulations present in an environment so that people’s behaviour is better aligned with their sense of self. The findings of this study offer several solutions for facilitating adolescents’ motivation for less intrinsically motivating activities. The development of a bond with a role model or mentor, and the influence of this on behaviour, is one example of how externally imposed tasks or activities can generate motivated and engaged behaviour. In terms reflective of the description of bond in the SDM (Catalano & Hawkins, 1996), Harry and Jack described how developing and sustaining such relationships motivated them to engage and persist with tasks that would otherwise be considered boring. This relationship offered a glimpse of the
life Harry and Jack could have for themselves, and that was particularly motivating. Collaborating with team members to achieve tasks is another motivational influence; the context-sensitive rehabilitation framework (Ylvisaker & Szekeres, 1998) and SSPM (Appleton et al., 2008), for example, both offer theoretical support to the importance of ensuring that an environment offers structure and support balanced with autonomy, and describe how this arrangement has the power to foster internalisation and integration of the values of the socialising unit.

Turning again to the findings of this study, it is hypothesised that supports for relatedness and competence facilitated the internalisation of behavioural regulation, and supports for autonomy facilitated integration of values through the provision of opportunities for involvement in tasks and practice of requisite skills and behaviours. In work environments where Harry and Jack felt as though they had a role to play and a sense of team was eminent, and where they were supported to develop the skills needed to complete tasks, they were more likely to display motivated behaviour. Through exhibiting such behaviour, the adolescents perceived that they were provided with more opportunities and were permitted some choice and control over these activities. These autonomy supporting environments further increased motivated behaviour, leading to engagement, the critical component for targeting development of executive functioning skills and associated routines. To relate this back to the findings of this study – Harry and Jack experienced an increasing sense of competence when at work, and correspondingly, perceived greater
autonomy in these contexts. Internalising and integrating regulations present in these contexts, supported by their mentor and teams, facilitated motivation and engagement to a point of cognitive engagement and an ability to self-regulate, or the desire to learn how to master EFs.

5.4.2 The role of engagement

The findings of this study indicate that motivation is conducive to engaged behaviour; positive contexts produce positive behaviours. The findings chapter outlined how Harry and Jack exhibited behavioural, emotional and cognitive engagement; within the discussion of the theme of engagement, it was hypothesised that it was at the point of cognitive engagement that Harry and Jack reported confidence and competence in their executive functioning skills.

Connell and Wellborn (1991) described three elements to cognitive engagement: flexibility in problem solving, preference for hard work, and positive coping in the face of failure. Ylvisaker and colleagues (Ylvisaker & DeBonis, 2000; Ylvisaker & Feeney, 1998a; Ylvisaker, Feeney, & Szekeres, 1998) have described a view of executive functions based on a “functional analysis of what contributes to success when individuals encounter obstacles in pursuit of their everyday goals” (Ylvisaker & DeBonis, 2000, p. 31). That description resonates with the elements of cognitive engagement described by Connell and Wellborn (1991). Among other aspects, Ylvisaker and colleagues listed the following components to goal-oriented behaviour: self-awareness of strengths and limitations, ability to plan and
organise behaviour to achieve goals, ability to initiate behaviour toward achieving goals and inhibit behaviour incompatible with goal achievement, and an ability to flexibly revise plans and strategically solve problems in order to avoid failure (Ylvisaker & DeBonis, 2000). It is for this reason that of the three states of engagement, cognitive engagement is specifically detailed in the R4RF. It has the most influence on confidence and competence in EF skills, because to be cognitively engaged, a person must be using EF skills effectively.

Appleton et al. (2008) suggested that engagement was malleable to interactions with contextual variables, and again, the findings of this study align with that thought. Consideration of the three dimensions of engagement can help clinicians devise programmes that facilitate adolescent participation in their everyday contexts. When adolescents’ psychological needs are met, when they are confidently engaged in meaningful activities and have meaningful social relationships, their quality of life is enhanced and their ability to develop effective executive functioning skills and routines is increased (Ylvisaker & Feeney, 2009). In recent years, the constructs of engagement (student engagement in particular), have received significant attention as predictors of general adolescent well-being, as protective factors against risk-taking behaviour, and as a means of designing intervention programmes to combat school dropout and declining academic motivation and to enhance achievement (Caraway et al., 2003; Catalano et al., 2004; Fredricks et al., 2004). Clinicians working in paediatric TBI rehabilitation are often faced with the
task of developing ways to support adolescents who are experiencing academic decline and considering school dropout, and possibly exhibiting risk-taking behaviours. Understanding engagement as a multi-dimensional construct will strengthen clinicians’ capacity to design and facilitate rehabilitation programmes that support adolescent development and well-being, while also enhancing confidence and competence in executive functioning skills.

The R4RF is anchored by three broad contexts that promote the psychological needs of adolescence – relatedness, autonomy and confidence. They are the building blocks to understanding the factors that Harry, Jack and their mums indicated as influencing motivation and engagement, that enabled them to build a sense of *who they could be* and *what they could do*, and the factors that were desired if Harry and Jack were going to feel confident in their executive functioning skills and start to show their mothers that they were able to function in a competent manner on a day-to-day basis. In the next section of this chapter I discuss each context and the chapter then closes with a summary of how the R4RF can be applied in clinical practice.
5.5 The Interpersonal Context

An adolescent’s need for secure, positive, skill-developing relationships, typically with non-parental adults, is considered within the interpersonal context. Relationships with non-parental adults are known to be an essential component of healthy adolescent development (Pasupathi & Hoyt, 2009), and the findings of my study showed that positive bonds with non-parental adults were a significant factor in Harry’s and Jack’s motivation and engagement, identity development, and level of confidence. The interpersonal context captures the theme of bond and, in particular, draws attention to the need to consider the sense of belonging that adolescents perceive at an individual and group level by highlighting the importance of role models/mentors and sense of team. Belonging and a sense of connectedness are central to adolescent development (Barber & Schluterman, 2008; Catalano & Hawkins, 1996; Resnick et al., 1993; Ylvisaker & Feeney, 1998c).

The elements of the interpersonal context are now discussed, drawing together the findings of my study with underpinning theories and pertinent literature, particularly the SDM (Catalano & Hawkins, 1996) and context-sensitive rehabilitation framework (Ylvisaker, 2003).
5.5.1 Bond

Within the current study, an overwhelmingly consistent theme that emerged was Harry’s and Jack’s need to be connected both with the environment in which they were learning and with at least one adult within that environment. While a sense of connection to the environment in which the young person was positioned was an important factor, the deeper more complex factor of interpersonal bond proved more crucial. Researchers in the health, education, and youth development fields have paid significant attention to bonds within the lives of adolescents (see for example Barber & Schluterman, 2008; Bond et al., 2007; Catalano & Hawkins, 1996). Findings have consistently documented the correlation of bond with a variety of health indicators and reported bonds as serving a protective function in adolescent development (Barber & Schluterman, 2008; Ozer et al., 2008).

The SDM (Catalano & Hawkins, 1996) identifies two socialising processes that promote healthy adolescent development: bonding to pro-social family, school friends, and peers; and clear standards or norms for behaviour. Within the SDM, three protective processes are also detailed: opportunities for involvement in productive, pro-social roles; the requisite skills to be successfully involved in these roles; and consistent recognition and reinforcement for involvement in the socialising unit (Catalano & Hawkins, 1996; Social Development Research Group, 2009). When these various processes were consistently experienced, a bond developed between the individual and socialising unit (Catalano et al., 2004; Catalano & Hawkins, 1996; Social Development Research Group, 2009). The findings
of my study have shown how these processes were present in the narratives of both Harry and Jack and consequently, how they developed a bond with the specific “socialising unit”, in this case, Jack’s workplace team and Harry’s army colleagues (Catalano & Hawkins, 1996). The SDRG also theorised that once a bond was well established it had the power to affect behaviour “by creating informal control on future behaviour” (Catalano & Hawkins, 1996, p.156). The socialising processes created a “feedback loop” where individuals’ behaviour was moderated by their desire to conform to the norms and values of the socialising unit. As my study shows, this can be a role model or mentor or the team, when a sense of belonging is established with that team.

Following control theory, the social bond consists of attachment to others in the social unit, commitment to or investment in lines of actions consistent with the socialising unit, and belief in the values of the unit.

(Catalano & Hawkins, 1996, p.157)

It is postulated in the SDM that bonding influences people’s behaviour as they weigh up the costs and benefits of a particular behaviour to their self-interest. Engaging in behaviour considered inconsistent with that of people with whom they have bonded can threaten the bond if exposed. This motivates individuals to strive for behaviours that enable bonds to be maintained and to prosper. Many psychological theories identify that human motivation and behaviour are enhanced when people perceive a sense of belonging (Faircloth, 2009; Maslow, 1987). Baumeister and Leary (as cited in Faircloth, 2009) made the case that the need for belonging (defined as the need to form at least a minimum quantity of affectively
positive relationships within a context) is so prevalent that it dominates a person’s emotion, cognition, behaviour, and health. Connell and Wellborn’s (1991) presentation of self-determination included acknowledgement that the extent to which the need for belonging (or relatedness, as it is termed in the theory of self-determination) (Ryan & Deci, 2000a) is met affects an individuals’ self-concept and their expectations of interactions within a context. The different self-perceptions of Harry and Jack as student versus employee are testament to the need for a sense of belonging and bond with person and place. In SDT (Connell & Wellborn, 1991; Ryan & Deci, 2000b) it is postulated that under conditions in which the need for relatedness is met, people exhibit higher levels of motivation and engagement. Explained in terms of Maslow’s hierarchy of psychological needs, the need for belonging, interpersonal connectedness, or bond, must be met before behaviours such as motivated engagement become the norm. Therefore, consideration of the interpersonal context in which a person is operating is pivotal to determining how motivation and engagement in rehabilitation can be enhanced.

5.5.1.1 Role models/mentors

Rehabilitation clinicians are advised to consider if a role model or mentor exists within a setting, or conversely, in which settings these important relationships and people exist. Role models and mentors possess the skills and abilities that adolescents want to achieve. Importantly, adolescents respect these adults, their opinion and their feedback. In keeping with the SDM, role models and mentors can significantly influence adolescents’ behaviours, their perception of available opportunities, and
their ability to develop skills, because of the bond that exists between the adolescents and the adults. Mentors can act as agents of change and fulfil the role of “master craftsperson” in the life of an “apprentice” (Ylvisaker & Feeney, 1998b, p. 450). Ylvisaker, Feeney and colleagues used an apprenticeship metaphor for describing the value of engaging in collaborative relationships to deliver TBI rehabilitation. They proposed that adults who interact with an adolescent on a daily basis “interact in a way that is natural and conversational but that also provides scaffolding [...] for incremental growth in cognitive performance, using as the context everyday activities and interactions” (Ylvisaker & Szekeres, 1998, p. 152). Mentors and role models identified by adolescents are well placed to fulfil this role and so need to be identified.

In outlining the theoretical basis for contextualised rehabilitation, Ylvisaker and Feeney (2002) discussed the need for adolescents to be provided with opportunities for productive involvement, mentoring relationships that support skill development, and recognition for effort, so as to promote a culture of self-reflection and the willingness to re-attempt unsuccessful tasks. Ylvisaker and Feeney’s work in the field of TBI rehabilitation has been guided by the earlier work of cognitive theorists such as Barbara Rogoff and, perhaps most significantly, Lev Vygotsky. Rogoff (1990) contended that experiences in which the mentee and mentor focused their joint attention on a task of interest to the young person were potent learning opportunities. Vygotsky proposed that cognitive functions developed through internalising interactions with
others. Vygotsky clearly defined the role of a more mature thinker in
directing interaction with the adolescent or “novice learner”. He set out a
role for the modelling of appropriate, organised thought patterns and
discourse (Ylvisaker & Feeney, 1998b). Ylvisaker and Feeney adopted this
view in their description of contextualised rehabilitation and postulated
that, in the same way, development of “executive functions like self-
awareness, goal setting, planning, self-monitoring and strategic thinking
can be understood as gradual internalizations of interaction routines”
(1998b, p. 14). Modelling of behaviour and self-talk to develop a learner’s
skills, as proposed by Rogoff, Vygotsky, and Ylvisaker and Feeney, reflects
the “apprenticeship” metaphor. It emphasises the need for collaboration in
meaningful tasks and settings, all of which Harry and Jack said enabled
them to have a positive perception of their EF skills.

Spencer (2006) used in-depth semi-structured interviews to examine
the relational processes that underpin bonds between adolescents and
adult mentors. Her study identified four relational processes commonly
present in relationships between mentors and mentees: authenticity
(“being real […] engaging with a relational partner in a genuine way” (p.
298)); empathy (mentors expressing an awareness and understanding of
the adolescent and mentees expressing that their mentor “understands or
gets them […] cares about them” (p. 296)); collaboration (“working
together to develop some skill or capacity” (p.296)); and companionship
(statements about enjoying being around each other). Many of the
processes identified by Spencer were reflected in Harry’s and Jack’s
narratives about the positive adult relationships they identified in the workplace.

Spencer (2006, p. 304) commented that the collaborations that emerged between mentee and mentor resulted from the “ongoing everyday interactions between these adults and adolescents and were based on the particular knowledge they had about the skills, capacities, and interests of the other” (p. 304). Like Harry and Jack, mentees in Spencer’s study commented on how mentors were directly involved with their learning as they worked with the mentees to show them how to approach and solve problems. Harry and Jack described distinct differences in their motivation and engagement when a setting offered collaborative learning opportunities, highlighting the need for productive team-based relationships in addition to the relationship with a role model or mentor.

5.5.1.2 Sense of Team

The SDM operationalisation of the concept of bond acknowledges the important role of the wider group setting and associated interactions in influencing adolescent behaviour, with the commitment component to bond accounting for adolescents’ investment in the “[team’s] line of action” (Catalano et al., 2004, p. 252). Such commitment to the team influences adolescents’ behaviours, actions, and choices, as behaving in a manner incongruent with the team’s standards and norms threatens the overall bond experienced.
The role of the “socialising unit” in the SDM (Catalano & Hawkins, 1996) is to provide opportunities for involvement in activities and tasks that reflect the value base of the broader group or team; to support adolescents to develop the cognitive, behavioural, and emotional skills required to participate in and make the most of available opportunities; and to recognise or reprimand adolescent involvement so as to reinforce the accepted norms and values of the group and consequently strengthen the frequency of pro-social behaviours. The R4RF adopts the principles of the SDM as well as those of the context-sensitive rehabilitation framework (Ylvisaker, 2003), to acknowledge the role of “everyday people” (Ylvisaker & Feeney, 1998b, p. 429) in the development and mastery of cognitive, behavioural, social, and emotional skills.

The context-sensitive rehabilitation framework advocates the involvement of everyday people in the delivery of rehabilitation efforts. This framework acknowledges the functional implications of cognitive, behavioural, and emotional impairments associated with TBI, and aims to embed intervention within everyday contexts and routines so as to optimally support the person with TBI (Ylvisaker & Szekeres, 1998). Ylvisaker (2003, p. 2) acknowledged that there is an “essential interconnectedness of cognitive functioning and context”.

It is important to consider whether a positive team environment exists in any setting in which the adolescent with TBI participates. Not only does the team around the adolescent influence whether exchanges and interactions have a positive or skill enhancing tone, a sense of team also
offers structure and support to interactions within a setting. A supportive team context encourages adolescents to practise cognitive routines so that they can regularly contribute to the team’s goals. One of the primary roles of team relationships identified in this study was to help adolescents refine and master the skills they wanted to “show off” to their role model. Engaging in activities with various team members often provided the repeated practice opportunities Harry and Jack needed to master various skills. The process of team-role development provided collaborative opportunities to build self-esteem by working with others on tasks that were authentic and allowed them to display their skills.

Within a Vygotskyan framework, group work with peers and colleagues, such as that described by Harry and Jack, creates opportunities for adolescents with TBI to receive feedback from a wider range of “coaches” (Ylvisaker & Feeney, 1998a). It also offers opportunities for adolescents with TBI to assume a coaching role within social interactions. In a supportive team environment, there will be times when the adolescent knows more or can be given a chance to lead interactions and activities; being given the chance to lead “the cognitive process of guiding another’s choices and behaviours is good practice for guiding one’s own choices and behaviour” (Ylvisaker & Feeney, 1998a, p. 14). Choosing to embed cognitive routines into environments that offer supportive team relationships in addition to mentoring relationships will increase the likelihood of success.
Both Harry and Jack identified that their teams in their work environments created a hierarchical structure for them to operate within; this was reassuring and offered some form of structure and routine to their time at work. Structure and routine have been identified by Ylvisaker, Feeney and colleagues as critical in helping adolescents with TBI to succeed in day-to-day environments. The basis of contextualised rehabilitation is, in fact, embedding intervention in “meaningful contexts and working to improve everyday routines in those everyday contexts” (Ylvisaker & Feeney, 1998b, p. 429). Jack’s recollection of the routine for setting up a worksite, and his acknowledgement that he was now “on top of [putting on] elbows, setting up profiles and stuff like that”, is testament to both the scaffolded instruction from his team-mates and the value of a team-based routine for adolescents with TBI.

Developing a role, or spot (Jack) in the team reinforced several psychological and developmental needs for Harry and Jack. It indicated that at some level, they had the skills and abilities to fulfil a role and carry out responsibilities associated with it; this was rewarding and reinforcing, and strengthened their relationships with other people in the team, the task, and the place. Productive relationships with other team members also reinforced the belief that they could be of value to the team. The security and safety this offered fed the development of their identity, self-esteem, and self-confidence. Catalano et al. (2004) have repeatedly argued that a secure relational basis that feeds positive experiences and opportunities produces pro-social behaviours. Hammell (2004) showed that being able to
contribute to reciprocal relationships contributed to a person’s sense of value, competence, connection, and belonging. To exert the effort required to develop effective executive functioning routines post-TBI, adolescents must feel of value and feel connected to the team around them. This is acknowledged in the R4RF.

A sense of team affects a person’s ability to experience meaningful participation in chosen activities or occupations. Using a grounded theory approach, Isaksson, Lexell and Skär (2007, p. 24) explored the importance of social support for young women with spinal cord injury, and concluded that to experience meaningful participation, “the person has to feel that he or she can make different choices, has control over the occupation, and has a supportive social network”. Both Harry and Jack articulated the same needs, but Harry was very clear about the different levels of social support he perceived between the army and school; this included his long-standing friendship group at school. Harry perceived that he did not have a supportive social network at school, but did perceive a sense of team and the inherent support in the army. The positive interpersonal context Harry perceived in the army made that environment, and Harry when he was in it, riper for rehab.

Although the primary relationship with a role model or mentor is influential in meeting adolescents’ need for a secure relational basis, the broader interpersonal context of how they fit with a team is another important factor in creating motivated and engaged behaviour. The sense of team experienced within an environment influences the likelihood of
adolescents to attempt tasks. It influences their motivation to “be part of it” (Jack). The processes undertaken to develop bonds across a setting have been shown in this current study, as well as in the SDM, to be important factors in creating secure relational bases for adolescents. Collaborative learning exchanges between adolescents and their mentors and teammates provide the grounding for the secure bonds that subsequently develop. Learning alliances that use authentic and purposeful tasks combined with flexibly structured teaching methods are more likely to engender a sense of competence in adolescents (Rogoff, 1990). Thus, the process of co-constructed learning, as discussed in the next section, serves the dual role of developing both technical skills and interpersonal bonds.

5.5.2 Co-constructed learning

The practice of co-constructed learning offers opportunities for skill development and time with a mentor, which facilitates consolidation of this relationship through collaborative, personally relevant, and meaningful activities. The works of cognitive theorists such as Vygotsky and Rogoff have shown that cognition, behaviour and psychological well-being can be influenced by learning within social contexts, and the work of Ylvisaker and Feeney in particular has consistently demonstrated how contextualised learning is optimal post-TBI (Ylvisaker & Feeney, 1998a).

Although co-constructed learning is not a term typically associated with TBI rehabilitation, many similar instructional terms, such as guided participation, scaffolding, modelling, and scripting, are widely used. Rogoff (1990) developed the concept of guided participation, emphasising that
both guidance (tacit or explicit) and participation (at a level suitable to the learner’s needs), are necessary to develop cognitive skills. Rogoff also emphasised that guided participation required the involvement of children and their companions in culturally valued activities. Scaffolding, a term coined by Bruner (Wood, Bruner, & Ross, 1976) similarly requires a more experienced other to assist a novice learner to “solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts” (Wood et al., 1976, p. 90). Scaffolding requires the more knowledgeable other to control the elements of the task that are beyond the novice learner, thus enabling the learner to concentrate upon and complete the elements within their range of competence (Wood et al., 1976). Scripting, the practice of developing well-organised behavioural routines or schemas of stereotyped event sequences (Abelson, 1981), is another similar process that supports a novice learner in developing the behaviours, conversational exchanges, and knowledge of event settings (place, participants, roles, and objects) associated with common social interactions (Abelson, 1981; Ylvisaker & Feeney, 1998a; Ylvisaker et al., 1998). All these instructional methods, like experiential learning, are rooted in socio-cultural exchanges, with a more knowledgeable other manipulating the environment and guiding the learner to develop successful and productive routines and behaviours.

The process of co-constructed learning exchanges allows adolescents to share meaningful and valued time with role models, mentors, colleagues, and peers. Within an experiential learning framework, the
emphasis is very much on the mentor and mentee, or master craftsperson and apprentice, collaborating as a team and focusing primarily on problems that are occurring in the moment. As in scaffolding, the mentor actively facilitates learning and the transfer of such learning. Activities and learning supports are flexibly structured to meet the needs of the learner and to emphasise the development of personal competencies (Newes, 2001). This process develops and deepens the interpersonal bond that exists between mentor and mentee. The discussions, conversations, and explanations that accompany such contextual learning offer opportunities for the mentee to learn and adopt the values, norms and behaviours of the mentor and wider team. The SDM clearly articulates how adoption of the “socialising unit’s” values and beliefs influences behaviour and strengthens bonds (Catalano & Hawkins, 1996, p. 157).

The contextualised rehabilitation framework similarly advocates collaborative learning exchanges. Ylvisaker and Feeney describe how collaborative relationships between therapists, everyday people and people with TBI are “justified because [they are] an expression of respect […] and a product of the relationship” (Ylvisaker & Feeney, 1998a, p. 236). Harry and Jack were both seeking and paying respect to their workplace mentors, and this characteristic of the relationship fuelled their motivation to learn and their engagement in the setting. Vygotsky (1978) focused on the connections between people and the socio-cultural context in which shared experiences occurred. He postulated that general cognitive processes as well as academic skills and content knowledge are best
acquired by children and adults working collaboratively; underpinned by these theories, the R4RF echoes such premises. It aims to prompt clinicians to look for relationships in the lives of the adolescents with whom they are working, that embody or have the potential to offer such supportive opportunities to develop positive behaviours. A secure relational basis sets up an environment so that adolescents with TBI can learn the behaviours and skills necessary to feel competent within themselves and their environment.

5.6 The Activity Context

The activity context considers adolescents’ need for authentic and meaningful activities of optimal challenge. Not surprisingly, authentic and meaningful activities are essential in engaging adolescents in TBI rehabilitation. The contextualised rehabilitation approach is built on two premises: 1) that the most effective intervention occurs in meaningful contexts, where the activities undertaken are designed to influence routines within that context (Ylvisaker & Feeney, 1998a); and 2) that “in the absence of meaningful engagement in chosen life activities, all interventions will ultimately fail” (Ylvisaker & Feeney, 1998a, p. 37). These two premises encapsulate Harry’s and Jack’s views of the cognitive and academic tasks they were asked to engage with during their rehabilitation.
They stated that tasks that were not seen as meaningful or relevant to them failed because they could not see any reason to engage in them. Choosing to engage in a task that might be difficult requires an individual to behave in a deliberate, self-regulated manner, and this takes time and effort. Such time and effort is unlikely to be expended if the young person does not perceive any relevance or pay-off for this extra effort (Ylvisaker & Feeney, 1998a, 2002). Thus, when expecting adolescents to apply the effort required to engage in rehabilitation, which by its nature presents tasks that challenge personal skill levels, clinicians are well advised to consider whether the tasks are relevant, meaningful, and hold some pay-off for the adolescent. The R4RF applies the premises of the context-sensitive rehabilitation framework to guide intervention directed at improving the EF, cognitive, behavioural and communication abilities of people who have had a TBI.

5.6.1 Task Relevance

The findings of my study highlighted that the tasks that adolescents are asked to engage with need to have real-life application; they need to help adolescents be “where they want to be” (Harry). Tasks need to help adolescents develop skills and routines to increase participation in day-to-day life, vocational and social goals. The SDM postulates that the first construct necessary for pro-social development is perceived opportunities for participation (Catalano & Hawkins, 1996). The key term in this premise is perceived opportunity; this was a defining factor for both Harry and Jack. Interpretation of their interview data suggested that they perceived
greater and more accessible opportunities (that is, tasks they considered matched their skill level and interest) within the work context rather than the school or academic context.

The SDM notes that perceived opportunity is influenced by exogenous factors such as position in the social structure, as well as individual factors such as cognitive ability and arousal levels. The SDM clarifies that “distinct from the actual number of different activities or interactions in which it is possible to participate” (Catalano & Hawkins, 1996, p.162), perception of opportunity is of causal importance. Furthermore, “It is not sufficient to engage individuals, for they must know the opportunity is available and must also know the opportunity satisfies their personal interest” (Catalano & Hawkins, 1996, p.163). As discussed in the theme of Task Relevance, people’s ability to perceive the relevance of a task to their goals, needs, and desires influences their behaviour or reaction toward that task and environment (Eschenfelder, 2005). The ability to recognise or perceive available opportunities within an environment was a defining factor for Harry’s and Jack’s level of engagement and displays of motivated behaviour. That is why task relevance should be explicitly considered when designing rehabilitation programmes, as more relevant tasks will be more readily perceived or identified as desirable opportunities.

The intrinsic motivation that can be generated by influential relationships upon a person’s level of engagement has been highlighted in the previous section. An equally influential component of intrinsic motivation is involvement in meaningful activities (Eschenfelder, 2005).
Understanding this goes someway to illuminating Harry’s and Jack’s different perceptions of school and work, and why, as they saw it, they were more competent with planning, organising, and problem solving tasks related to vocation than to academia. Achieving a balance between task, person, and place resulted in higher motivation, engagement, confidence and, ultimately, the ability to work toward a sense of competence.

Competence, like a secure relational basis, has been identified as another of the innate psychological needs of adolescence (Connell & Wellborn, 1991; Ryan & Deci, 2000a). Competence has been described as self-beliefs about “control, strategies and capacity” (Fredricks et al., 2004, p. 81). Hughes et al. (2011, p. 288) identified perceived competence as a “common core for self-efficacy and self-concept”. Theories of human engagement and motivation have proposed that “action (engagement versus disaffection) and outcome differences result from interactions within the social context that determined how well the student perceived the environment to meet his or her fundamental needs of autonomy, competence and relatedness” (Appleton et al., 2008, p. 370). The key themes of adolescents’ motivation, engagement, and confidence/competence discussed in the previous chapter were all influenced by their competence beliefs. The outcomes of this study show that when an environment provides adolescents with the educational and social supports needed to ensure they experience success in the interactions and activities undertaken, they report a higher level of self-confidence and competence. Jacobs et al. (2002) reported that children
were more motivated and more inclined to select tasks of increasing challenge when they believed they had the ability to accomplish a task. Belief in one’s ability to complete a task is fostered through supportive interpersonal relationships (as detailed in the interpersonal context) and also through appropriate task selection and socio-cultural supports to achieve the task. The context-sensitive rehabilitation framework, SDM, and SDT all emphasise the importance of engaging adolescents in activities that are achievable either independently or with the assistance of instructional supports like guided participation, scaffolding, and modelling. The activity context of the R4RF aims to encourage clinicians to carefully consider the tasks and activities selected as the medium for cognitive rehabilitation and the contextual supports instated to facilitate adolescents’ participation in these tasks.

5.6.2 Contextualised instruction

The process of contextualised instruction created opportunities for Harry and Jack to experience and consolidate meaningful relationships with mentors and work teams, and served to make the relevance of some tasks apparent. As stated earlier, it is perception of opportunity that is of causal importance to adolescents determining whether an opportunity or activity is going to meet their relatedness, competence, and autonomy needs. To undertake a task, adolescents must perceive the availability and value of the task and feel efficacious towards it. That is, they must have a sense that they understand the task and possess the relevant skills to succeed at it. Self-efficacy increases the likelihood that an externally imposed goal, an extrinsically motivated goal, will be adopted and attempted (Ryan & Deci,
Transferring this observation to rehabilitation, clients will more likely adopt and internalise a therapy goal if they understand it and have the relevant skills to succeed at it. Within the SDT (Ryan & Deci, 2000b) it is theorised that supports (e.g., offering optimal challenges and constructive feedback) “that conduce toward feelings of competence during action can enhance intrinsic motivation for that action because they allow satisfaction of the basic psychological need for competence” (Ryan & Deci, 2000a, p. 58).

5.6.2.1 The importance of activities of optimal challenge

Basic training in allied health professions such as speech pathology and occupational therapy introduces the notion of *activities of optimal challenge* to aspiring clinicians. Therapeutic tasks included in cognitive rehabilitation programmes need to be optimally challenging in order to engage adolescents as well as to promote skill development and a sense of competence. Activities of optimal challenge are those that are plausibly achievable by the adolescent (Ryan & Deci, 2000a). Vygotsky argued in his social developmental theory that learning and cognitive development best occurred when the task being undertaken was within the learner’s *zone of proximal development* (ZPD). Vygotsky (1978, p. 86) defined ZPD as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers”. Thus, the activity context of an environment used for cognitive rehabilitation must offer adolescents relevant meaningful tasks, of optimal challenge, and the contextual
support systems necessary to achieve those tasks. The concept of optimal challenge is central to the theory of experiential learning, and it is why the principles of experiential learning are included as a consideration in the activity context as well as the interpersonal context (in the form of co-constructed learning). The process and practice of experiential learning create the optimal interpersonal and instructional context for adolescents with TBI.

Experiential learning theory is based on the belief that individuals learn when placed outside their comfort zones and into a state of dissonance. Learning is then assumed to occur through the necessary changes required to achieve personal equilibrium or mastery of the environment (Shanahan, McAllister, & Curtin, 2009). Experiential education theory postulates that active learning is often more valuable for the learner because the participant is directly responsible for and involved in the process. Kraft and Sakofs (1985) outlined several elements inherent to the experiential education process:

a) The learner is a participant rather than a spectator in learning;
b) The learning activities require personal motivation in the form of energy, involvement, and responsibility;
c) The learning activity is real and meaningful in terms of natural consequences for the learner;
d) Reflection is a critical element in the learning process;
e) Learning must have present as well as future relevance for the learner and the society in which he/she is a member.

(Gass, 1993, p. 4)
Gass (1993) reworked these experiential education principles so they were applicable to therapy:

a) The client becomes a participant rather than a spectator in therapy;
b) Therapeutic activities require client motivation in the form of energy, involvement, and responsibility;
c) Therapeutic activities are real and meaningful in terms of natural consequences for the client;
d) Reflection is a critical element of the therapeutic process; and
e) Functional change must be present as well as future relevance for clients and their society. (Gass, 1993, p.5).

Contextualised rehabilitation practices use principles akin to those of experiential education. Once again, both the Contextualised Rehabilitation Framework developed by Ylvisaker and Feeney, and Barbara Rogoff’s (1990, p. 39) conceptualisation of “apprenticeship in thinking” offer theoretical groundings for the R4RF and the role of contextualised instruction. Considering how adolescents’ learning in context is best supported and achieved will generate motivation and engagement. Contextualised instruction offers adolescents with TBI guided participation in meaningful tasks, thereby enhancing self-esteem.

5.6.2.2 Apprenticeship approach

Rogoff (1990, p. 8) developed the concept of “guided participation” to suggest that both “guidance and participation in culturally valued activities are essential to children’s apprenticeship in thinking”. Like experiential education, guided participation uses scaffolded support to attain new knowledge and skills, arranging and structuring participation to allow learners to capitalise on the social resources available to them. It allows
adolescents to assume “increasingly skilled roles in the activities of their community” (p. 6). This approach was most certainly favoured by Harry and Jack. My study findings showed that adoption of a guided approach to participation resulted in heightened self-efficacy, motivation and engagement.

The apprenticeship approach to rehabilitation encapsulates the belief that cognitive development, like many areas of skill development, occurs through guided participation in social activity with more knowledgeable others. These people may be parents, teachers, therapists, and in some cases, peers. The role of the more knowledgeable other is to “support and stretch children’s understanding of and skill in using tools of culture” (Rogoff, 1990, p. vii). The apprenticeship approach to developing self-regulatory skills in children and adolescents combines Vygotskian theory of cognitive development with insights from the Positive Behaviour Interventions and Supports (PBIS) movement used in behavioural psychology. Ylvisaker and Feeney (2009) admitted that PBIS and Vygotskian approaches are rarely discussed together, but claimed that there are similarities between the two:
Both focus on supports or “scaffolding” to facilitate successful activity participation, as opposed to reactive procedures implemented after the individual has acted. Both describe procedures designed to enable individuals to succeed at meaningful tasks in relevant contexts then systematically reduce supports as the individual gains competence and self-regulatory control. Both highlight context (including settings, people in those settings, activities and supports for performance) and context-sensitive assessments, interventions and supports. Both highlight the importance of personal meaningfulness of activity contexts and the role of guided participation in those contexts. Both can be seen as prescribing an apprenticeship in self-regulation. (p. 374)

Ylvisaker and Feeney (2009) acknowledged that the term *apprenticeship* and its associated applied practices are not new methods in the fields of cognitive and academic intervention that apply a Vygotskyan framework; however, the term is more novel within behaviour management practices, especially with regard to self-regulation development. The authors explained that the metaphoric term *apprenticeship* is used to “suggest that services and supports for children and adults with poorly regulated behaviour be understood by analogy with more standard apprenticeships, as in fields like auto mechanics” (Ylvisaker & Feeney, 2009, p. 370).

Within an apprenticeship approach to cognitive rehabilitation, adolescents achieve a shared understanding with those who serve as their mentors through “explanation, discussion, provision of expert models, joint participation, active observation, and arrangement of roles” (Rogoff, 1990, p.6). The components of the R4RF do not exist in isolation from each other; as would be expected when considering contextual factors, there is fluid
interaction and influence across the socio-cultural fields. The concept of experiential learning highlights this, as engagement in contextualised instruction allowed Harry and Jack to learn the values and culture of their superiors while gradually developing a sense of competence within an environment that was supportive of their needs. It served as a highly effective method of strengthening Harry’s and Jack’s executive functioning skills, albeit unlikely that this was intentional from their mentors’ perspective. To quote Rogoff again:

Human skills and activities have a sociocultural basis – including children’s orientation to participate in and build on activities around them. The particular skills and orientation children develop are rooted in the specific activities of the community in which children and companions interact.

(1990, p. vii)

The apprenticeship analogy contains the following components:

a) Facilitation of self-regulation is largely delivered in the context of authentic and personally meaningful activities;
b) Supports (i.e. scaffolding) are provided so that the apprentices routinely succeed at tasks that then become systematically more demanding as the apprentice gains competence (an approach that is consistent with errorless learning);
c) Those supports are gradually reduced as it becomes possible to do so;
d) Relevant “tools” are offered to the apprentice so that performance can become increasingly independent (including scripted language and self-talk as tools of self-regulation); and
e) Facilitators of self-regulation (e.g. teachers, parents, clinicians, community support staff) are responsible for modelling mature self-regulation (including the use of its tools), systematically turning over the tools of self-regulation to the apprentice and in general creating a culture in which self-regulation (vs control by others) is valued.

(Ylisaker & Feeney, 2009, p. 370)
The process of providing scaffolded support to build a child’s skills is similar to the process used in teaching trades and the skills needed to become a “master craftperson” (Ylvisaker & Feeney, 1998b, p. 450). It was this approach to teaching and learning to which Harry and Jack were most receptive. Ensconced in this mode of learning, Harry and Jack developed not only the technical skills required for their profession; they also acquired the behaviours and scripts that were considered appropriate and necessary to engage in the work environment. When combined, the technical, behavioural and socio-communicative skills they acquired enabled them to act the part and receive the associated positive reinforcements. This ultimately, allowed both adolescents to develop pro-social identities.

5.7 Developmental Context

By considering the developmental context when designing and reviewing the delivery of rehabilitation programmes to adolescents, clinicians take into account the normal developmental processes that occur during adolescence. In particular, rehabilitation clinicians need to consider whether their efforts are helping young people to develop a personal authority, a state that reflects adolescents’ ability to take growing responsibility for their life (Williamson & Bray, 1988), and if efforts are
supporting the development of a satisfactory identity coupled with meeting the need for opportunities for autonomy.

Consideration of the developmental context prompts clinicians to view adolescents they are working with as just that: young people moving through the same diverse physical, psychological, and social developmental stages as their peers. The next section highlights that adolescents who have sustained a TBI are at risk of following a disrupted path through adolescence as a consequence of the typical impairments following TBI. Several researchers in the field of adolescent TBI have recently argued the need for rehabilitation clinicians to first understand the developmental phase of adolescence (V. Anderson & Catroppa, 2006; V. Anderson & Ylvisaker, 2009). Furthermore, longitudinal research into risk factors, protective factors and resiliency factors in adolescence supports the need for all professionals engaged in supporting adolescents to have an understanding of the factors that promote a successful transition into and out of this life stage (Catalano & Hawkins, 1996; Masten, 2004).

5.7.1 A developmental trajectory

Broadly speaking, adolescent development is regulated by the multiple social contexts in which it is embedded (Lohman et al., 2007). This has been acknowledged in research outcomes across diverse fields, including sociology (for example: Barber & Schluterman, 2008; Catalano & Hawkins, 1996), developmental psychopathology (Masten, 2004) and paediatric and adolescent TBI (Ylvisaker & Feeney, 1998a; Ylvisaker et al., 1998). The study of resilience in adolescence offers some interesting insights into the
connections between the development of self-regulatory processes and neurological development, with the combined outcome affecting individuals’ ability to negotiate a successful passage through adolescence (Masten, 2004). From a neurological rehabilitation perspective, recent investigation of the implications of early childhood brain injury have revealed that developmental considerations, such as age at injury, developmental stage of brain development, family supports and coping abilities, and functional maturity, are all shown to influence outcomes post-injury (V. Anderson & Ylvisaker, 2009). Furthermore, research has shown that whereas some principles of adult models of TBI rehabilitation are applicable to paediatric and adolescent rehabilitation, many are not (V. Anderson & Ylvisaker, 2009). Understanding of the developmental factors that influence a person’s transition from childhood, through adolescence, and into adulthood, has not typically been advocated in TBI rehabilitation practice. However, the findings of my study indicate that such knowledge should, in fact, be the domain of the rehabilitation clinician.

5.7.1.1 Executive function development and negotiating adolescence

It is now widely accepted that EF development occurs along a gradual trajectory, extending from early childhood through to adulthood (Hudspeth & Pribram, 1990; Ylvisaker & Feeney, 1998c). The prolonged maturation of the frontal lobes influences the development of EF skills, as do experiences and expectations of others within a person’s environment (P. Anderson, 2002; Hudspeth & Pribram, 1990; Ylvisaker & Feeney, 1998c). As well as considering the neurological development that occurs during adolescence (e.g., myelination and dendritic pruning processes), developmental
psychopathology studies, reinforced by studies of risk and resilience, highlight the need to simultaneously consider the social and cultural influences on development. This has culminated in viewing adolescent development as occurring within a dynamic systems model (Catalano et al., 2004; Hudspeth & Pribram, 1990; Lohman et al., 2007; Masten, 2004). Masten (2004, p. 311) highlighted that “interactions of individuals and the systems in which development unfolds not only serve regulatory functions for individual behaviour but also shape and are shaped by brain development”. EF development needs to be thought of in light not only of neurological development but also of the increasing and widening social and cultural influences experienced by adolescents.

As noted in the discussion of the interpersonal context, studies of connectedness have exploded in recent years. Study findings have reiterated that social belonging, with the opportunity to explore and commit to a social identity that allows young people to develop strengths within a value system of a defined group, is a necessary component of adolescent development (Barber & Schluterman, 2008; Catalano & Hawkins, 1996; Resnick et al., 1993; Ylvisaker & Feeney, 1998c). The SDM has been used throughout my study to support the interpretation of data and as a foundational theoretical model in the development of the R4RF (Catalano & Hawkins, 1996; Social Development Research Group, 2009). It is interesting to note that research into risk-taking behaviour and resilience in adolescence, led by the SDRG, repeatedly acknowledges the impact of self-regulatory or EF skills on achievement of a successful outcome from
adolescence. Table 5.1, adapted from Masten (2004), details the commonly reported correlates and predictors of resilience in adolescents. Together, this underscores the need for rehabilitation clinicians working with adolescents to understand not only evidence pertaining to neurological outcomes, interventions, and models, but also the broader literature surrounding successful adolescent development, as “good regulatory capacity, utilized effectively toward achieving age-salient developmental tasks, holds the key to successfully negotiating the adolescent transition” (Masten, 2004, p. 316).
Table 5.1: Widely reported correlates and predictors of resilience in youth and their association with impairments post childhood TBI.  
(Taken from Masten, (2004) p. 315)

<table>
<thead>
<tr>
<th>Predictors of resilience</th>
<th>Common impairments of childhood TBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or more effective parents</td>
<td>Widely acknowledged and well reported impairments post-TBI (see for example: V. Anderson &amp; Catroppa, 2005; B. Brookshire, Levin, Song, &amp; Zhang, 2004; Levin &amp; Hanten, 2005; Nadebaum, Anderson, &amp; Catroppa, 2007).</td>
</tr>
<tr>
<td>Connections to other competent caring adults</td>
<td>Widely acknowledged and well reported impairments post-TBI (see for example: V. Anderson &amp; Catroppa, 2005; B. Brookshire, Levin, Song, &amp; Zhang, 2004; Levin &amp; Hanten, 2005; Nadebaum, Anderson, &amp; Catroppa, 2007).</td>
</tr>
<tr>
<td>Cognitive, attention, and problem-solving skills</td>
<td>Effective emotion and behaviour regulation</td>
</tr>
<tr>
<td></td>
<td>Widely acknowledged and well reported impairments post-TBI (see for example: Feeney &amp; Ylvisaker, 2003; Ganesalingam, Sanson, Anderson, &amp; Yeates, 2006; C. A. Hawley, 2003; Ylvisaker &amp; Feeney, 2009; Ylvisaker et al., 2003)</td>
</tr>
<tr>
<td>Positive self-perceptions (or efficacy, worth)</td>
<td>Positive self-perceptions (or efficacy, worth)</td>
</tr>
<tr>
<td>Beliefs that life has meaning; hopefulness</td>
<td>Positive self-perceptions (or efficacy, worth)</td>
</tr>
<tr>
<td>Religious faith and affiliations</td>
<td>Aptitudes and characteristics valued by society (e.g. talent, attractiveness)</td>
</tr>
<tr>
<td>Aptitudes and characteristics valued by society (e.g. talent, attractiveness)</td>
<td>Pro-social friends</td>
</tr>
<tr>
<td></td>
<td>Loss of friendship and difficulty maintaining friendships a widely acknowledged and well-reported impairment post-TBI (see for example: Prigatano &amp; Gray, 2007; Prigatano &amp; Gupta, 2006; Ylvisaker et al., 2001).</td>
</tr>
<tr>
<td>Socio-economic advantages</td>
<td>Socio-economic advantages</td>
</tr>
<tr>
<td>Effective school, school bonding</td>
<td>Effective school, school bonding</td>
</tr>
<tr>
<td></td>
<td>Studies examining return to school post-injury have indicated the value of a reintegration aide to facilitate return to school (see for example Mealings &amp; Douglas, 2010). Many students are not provided with such an aide due to cost, education department support policies, and adolescent preference to not have an aide. This can compromise return and retention of students with TBI at school (see for example: Parkin, Mass, &amp; Rodger, 1996).</td>
</tr>
<tr>
<td>Effective community (e.g. safe, with emergency services, recreation centres)</td>
<td>Effective community (e.g. safe, with emergency services, recreation centres)</td>
</tr>
</tbody>
</table>
5.7.2 Identity development

Adolescents with executive function impairment after brain injury are, in our experience, as interesting a group of folks as one could wish to work with. As adolescents they are engaged in the prolonged normal developmental processes of establishing their adult identities, often in opposition to the perceived over-restrictiveness and over-involvement of adult authorities. Furthermore, the natural focus of most adolescents is on acceptance within a chosen group of peers and on personal strengths within a value system defined by that social group. From this perspective, great skill is required to entice the student into the world of effortful compensatory behaviour, a world that presupposes frank acknowledgement of disability and of long-term difficulty with achieving personal goals without strategic behaviour.

(Ylvisaker & Feeney, 1998c, p. 1067)

This quote captures many of the themes of this study that have been synthesised with existing literature and models pertaining to adolescent development and rehabilitation to create the R4RF. The aim of the R4RF is to guide clinicians’ thinking when developing and reviewing rehabilitation plans for adolescent clients, as well as when attempting to engage adolescents in TBI rehabilitation. The quote captures the adolescent’s role of establishing oneself in a peer group, and adopting and adhering to the values of that group as addressed in the discussion of the concept of bond; it highlights the competing demands of adolescents seeking opportunities for individuation and autonomy in order to develop self-confidence, contrasted against the perceived restrictions of parents. In my study, that conflict came through as differing foci on confidence and competence, and the typical adolescent developmental processes outlined in Theme 1: Development of Self.
The process of identity development in adolescence has been extensively researched, with the work of Erikson (1968), and Marcia’s (1980) elaboration of that work, cited as the most important theoretical studies of identity formation (Fadjukoff et al., 2007; Faircloth, 2009). Erikson proposed that identity development occurred as a person moved through phases of crisis and resultant commitment (Schwartz, 2008); Marcia posited identity development as a dynamic structure that moves through four distinct stages, with each status varying in response to two complementary dimensions: exploration and commitment. In the first stage, “diffusion”, no firm commitments to identity development occur; in the second stage, “foreclosure”, commitments are made without understanding or questioning; the identities assumed during this stage are typically through identification with parents or other influential authority figures. During the third stage, “moratorium”, adolescents are actively exploring alternative identities without yet making a commitment. The final stage, “achievement”, is characterised by relatively firm commitments to an identity following a period of exploration (Fadjukoff et al., 2007). Erikson stated that entering into adulthood offered opportunities to explore identity and make decisions related to identity about things such as occupation and lifestyle. This, he claimed, helped consolidate people’s identity, moving them toward achievement (Fadjukoff et al., 2007; Shulman et al., 2005). The narratives offered by Harry and Jack strongly indicate their focus on these typical developmental aspects of identity formation. They often reflected their desire to construct an identity that
was productive and contributory, a contrast to the disengaged and disaffected identities they experienced as students.

Identity reconstruction post-TBI has been addressed within the rehabilitation literature (see for example: Ylvisaker et al., 2008), with the concept of growth following TBI currently receiving attention (McGrath, 2011; Ownsworth & Fleming, 2011; Silva, Ownsworth, Shields, & Fleming, 2011). However, most studies addressing identity post-injury have focused on adults who have sustained a TBI. Although many adults post-injury are required to reconstruct their identity, most adolescents experience a disrupted period of identity formation consequent to TBI rather than the need to “reconstruct” their identity post-injury. This is because many would have acquired a TBI in early or middle childhood, and thus have not yet moved through significant periods of identity formation (Ylvisaker & Feeney, 2000; Ylvisaker et al., 2008). Yet the growing literature on identity after brain injury repeatedly highlights the need for an organised, compelling, and reasonably realistic identity post-injury as a means of both engaging with and being motivated for rehabilitation (Biderman, Daniels-Zide, Reyes, & Marks, 2006; Klinger, 2005).

The theory of Possible Selves, presented in the discussion of Theme One: Development of Self, is a useful tool in helping individuals with TBI achieve a sense of personal agency. This theory has been proposed as providing the link between self-concept and motivation, as this type of self-knowledge reflects how individuals think about themselves, their potential, and their future (Markus & Nurius, 1986). Markus and Nurius (1986, p. 954)
asserted that possible selves are cognitive manifestations of long-term goals, aspirations, motives, fears and threats, and correspondingly, provide the “specific self-relevant form, meaning, organization and direction to these dynamics”.

Ylvisaker and colleagues have used the theory of Possible Selves, along with several other theories that encompass cognitive processing, cognitive organisation, and self-regulation, to develop a set of clinical processes collectively termed “metaphoric identity mapping” (Ylvisaker & Feeney, 2000; Ylvisaker et al., 2008, p. 718). Once again, the literature surrounding this clinical tool centres on adult populations with TBI and their frequent need to reconstruct identity. However, the principles and tools are applicable to adolescents who are developing, exploring or re-establishing an identity post-injury. Ultimately, the process aims to assist individuals to develop “a productive and motivating sense of self that includes a vision of desirable short and long-term future, but also the hard work and strategic behaviour needed to achieve important goals” (Ylvisaker & Feeney, 2002, p. 66).

The opportunities available to Harry and Jack to develop their identities based on the role models available to them within their workplaces have been extensively discussed; the ways in which the self is influenced by contextual processes in the family, peer, and school domains have also been highlighted. Throughout the themes of this study, the influences of peer acceptance and academic performance on self-concept in early adolescence have also been apparent. Harry and Jack reported a
positive and fulfilling identity when in the army or at work, and a negative and frustrated sense of identity when at school. Occupational identity has now been well associated with people’s social and personal identities (Christiansen, 1999; Phelan & Kinsella, 2009). For Harry and Jack, it was through their occupational pursuits that they were best able to explore and commit to a satisfying identity.

All the elements listed above as impacting on identity and self-development (access to role models; socialisation processes of family, peers and school; academic performance; and occupational participation) are reflective of the literature on adolescent identity development (Schwartz, 2008). This reiterates the point that adolescents with TBI are progressing through the same developmental processes as their peers, influenced by the same individual and socio-cultural features. These relationships demonstrate why rehabilitation clinicians need to understand how development of self and identity can be harnessed as a motivational factor in rehabilitation. Assisting adolescents to experience environments, settings, activities and exchanges that support the development of their hoped-for self will foster motivation (Markus & Nurius, 1986). Providing opportunities for autonomous action and allowing experiences of independent goal setting, decision making and problem solving, for example, will increase the likelihood that adolescents will participate in and enjoy activities (Ryan & Deci, 2000b; Ylvisaker & Feeney, 1998a). Such opportunities are also necessary to foster adolescents’ ability to
individuate and differentiate themselves from their family and to take increasing responsibility for their lives (Williamson & Bray, 1988).

5.7.3 Process of Individuation

A key developmental task for adolescents is gaining autonomy from parents and becoming independent adults (Yelle, Kenton, & Koerner, 2009). Individuation is the process of decreasing dependency on significant others, particularly parents, and gaining independence and self-governance (Levpuscek, 2006). It is argued that maintaining emotional closeness to parents while gaining functional and decision-making independence is essential to healthy adolescent development (Bell, Allen, Hauser, & O'Connor, 1996). This process forces the parent–adolescent relationship to experience a transformation, hints of which were alluded to by Harry, Jack and their mums in their in-depth interviews within my study. The contrasting views and needs for confidence and competence in skills, as discussed in the theme of confidence and competence, illustrate one way in which the process of individuation is operationalised during adolescence.

Developing a sense of self, while at the same time developing and sustaining close relationships with others, is central to the process of individuation (McLean, Breen, & Fournier, 2010). Individuation is a behaviour-based approach to understanding identity development (McLean et al., 2010). It invokes the need to meet two of the three basic psychological needs identified for healthy adolescent development: relatedness, as discussed in the interpersonal context, and autonomy. As has been repeatedly noted, having secure relational bases and
opportunities for autonomous behaviour positively influence motivation (Ryan & Deci, 2000b). Therefore, as one of the aims R4RF is to heighten clinicians’ understanding of the processes influencing adolescent motivation and engagement in rehabilitation post-TBI, an understanding of individuation is required.

An appreciation of the process of individuation is also required for clinicians to support adolescent clients through this developmental stage and act as advocates on adolescents’ behalf when required. Ylvisaker and Feeney (1998a, p. 177) observed:

Life after brain injury is often dominated by externally imposed restrictions on choice and activities, including physical, social, academic, vocational, and recreational activities. These inevitable restrictions are often exaggerated by an overly protective posture on the part of parents and staff, and by an overriding concern that people with severe TBI are incapable of making sound choices themselves.

The importance of choice and control was very apparent in the interview transcripts of Harry and Jack. The lack of choice and control available within educational environments was de-motivating and sparked a cycle of disengagement and dissatisfaction. While the positions Harry and Jack held within their teams at work did not afford much more control, both adolescents were choosing “to be there”, and to their mind, were more frequently offered the choice to participate in achievable and rewarding tasks supported in a context that met their needs for relatedness and autonomy.
Rehabilitation clinicians need to act as advocates for their adolescent clients. Indeed, “overly protective postures” from parents and teachers can at times limit the opportunities and thus the choices available to adolescents with TBI. Rehabilitation clinicians are urged to remind family members, educators, employers and friends that young people: (a) have emerging skills and requires experiences and flexible support to develop and consolidate those skills; and (b) in line with the developmental trajectory of adolescence, young people are seeking greater choice and control in their own lives.

5.7.4 Opportunities for self-determination

Like most people, adolescents with TBI strive to be actively involved in shaping their lives (J. Heckhausen et al., 2010). In essence, adolescents with TBI seek to follow developmental paths that allow them to identify and pursue long-term goals. Although they may at times need support to determine achievable and realistic goals, develop and maintain action toward these goals, or disengage from goals that are no longer attainable (Ylvisaker & DeBonis, 2000), their primary aim is to maintain a sense of personal agency (J. Heckhausen et al., 2010).

People are active agents in their own development. Individuals “choose and influence the contexts that in turn contribute to their development” (Masten, 2004, p. 312). The findings of my study support the now well-documented contention that contexts that offer opportunity for choice and control are the contexts most likely to enhance intrinsic motivation and have a greater positive effect on adolescents’ development (Catalano &
Hawkins, 1996; Connell & Wellborn, 1991; Lohman et al., 2007; Ryan & Deci, 2000a). A large part of adolescent development is having opportunities to engage with socio-cultural contexts that allow autonomy or self-determination (Lohman et al., 2007). Self-determination is a factor in identity development as well as a central psychological need in motivational behaviour (Lohman et al., 2007; Ryan & Deci, 2000b). Environments that are supportive of autonomy are also central to the development of bonds between adolescents and adults (Barber & Schluterman, 2008). Data collected from interviews with Harry and Jack showed that autonomous actions created a sense of satisfaction and pride, building self-efficacy and the concept that their “possible self” was attainable. Autonomy is the third innate psychological need of adolescent development and is a catalyst for engaged behaviour (Barber & Schluterman, 2008; Fredricks et al., 2004).

One purpose of considering the developmental context of settings in which adolescents are situated is to determine the potential of a setting to support autonomy. Settings that are supportive of autonomy are presumed to enhance motivation and engagement (Appleton et al., 2008; Ryan & Deci, 2000b). Furthermore, Fredricks, Blumfield, and Paris (2004) proposed that contexts supportive of autonomy may have a developmental component in relation to engagement. Thus, adolescents who are more capable and desirous of independence may be more responsive to environments that foster autonomy. This was certainly the case for Harry and Jack. They each identified that the behavioural and self-regulatory
differences they experienced between school and work settings were linked to features of the setting. One such feature was the ability of the setting to support and encourage autonomous action, and the other was their own developing ability to seek and respond to opportunities for autonomy. As they perceived that their work environments provided them with more frequent opportunities for autonomous behaviour they were able to develop more positive perceptions of their EF skills in these environments. This is captured in Figure 5.2.

Figure 5.2 has been developed based on the work of Connell and Wellborn (1991) who authored the Self-Systems Process Model (SSPM). Within the SSPM, self-development was proposed to occur as people sought experiences that fulfilled their needs of competence, autonomy, and relatedness. Figure 5.2 shows that during adolescence there is a naturally occurring developmental growth in opportunities for independent action across various occupational domains (social, vocational, educational, etc.). At the same time as the frequency of opportunities to experience independence increases, adolescents also wish for an increased level of autonomy in their lives. The increasing frequency of opportunities for independent action creates the likelihood of adolescents perceiving opportunities for autonomous behaviour; this meets their desire for greater autonomy, as illustrated in the middle of Figure 5.2. Just as the SDM notes that *perception of opportunity* (Catalano & Hawkins, 1996) is of causal importance to pro-social development, perception of opportunity for autonomous action is of causal importance to increasing adolescents’
motivated behaviour. A sense of autonomy, along with competence and relatedness, has been identified by Ryan and Deci (2000b) as enhancing intrinsic motivation.

Contexts that met Harry’s and Jack’s psychological needs of autonomy, relatedness, and self-confidence promoted a positive perception of executive functioning skills. These three psychological needs are the factors that draw the findings of this study into alignment with existing theories of adolescent social development, human motivation, and contemporary cognitive rehabilitation practices.

**Figure 5.2: The developmental impact of autonomy on engagement**  
(based on the work of Connell and Wellborn, (1991))

**5.8 Summary**

Adolescence is a period of physical, psychological, and social transition between childhood and adulthood (Burnett & Blakemore, 2009). Early adolescence sees increasing hormonal levels and associated physical development. Neuroanatomical maturation is also occurring, leading to changes in social skills, behaviour and cognition (Burnett & Blakemore, 2009; P. H. Hawley, 2011). Large-scale longitudinal studies of adolescent social development have identified risk factors, protective factors and
resiliency factors in adolescents that influence their pathway through this life stage (Catalano et al., 2004; Masten, 2004; McNeely et al., 2002; Resnick et al., 1993). Scholars in a number of fields addressing therapeutic involvement with adolescents, including the field of TBI rehabilitation, have called for professionals working with adolescents to develop understanding of the multi-dimensional developmental phase of adolescence, and of how therapeutic interventions can support adolescent physical, social, psychological and cognitive development (V. Anderson & Ylvisaker, 2009; Catalano et al., 2010; P. H. Hawley, 2011; J. Heckhausen et al., 2010; Masten, 2004; McNeely et al., 2002; Roulstone & McLeod, 2011).

The R4RF captures the environmental features that support social, psychological and cognitive development, promote motivation and engagement, and build self-esteem, confidence and competence. The developmental context in the R4RF captures some of the developmental tasks of adolescence that were shown to affect perception of confidence and competence in EF skills. For Harry and Jack, contexts that supported their identity development, extended opportunities for independent, autonomous action, and supported their individuation from family and fostered links with peers and colleagues were contexts more likely to produce a sense of self-confidence. This translated into heightened intrinsic motivation and engagement with person, task and place.

The occupational settings in which Harry and Jack were engaged enabled them to explore their possible selves. Their interview transcripts were punctuated with remarks about “just wanting to be” (Jack), and how
work colleagues “see me, the real me” (Harry). Studies investigating occupational identity have concluded that identities are “closely tied to what we do and our interpretations of those actions” (Phelan & Kinsella, 2009, p. 85). Had Harry and Jack viewed themselves as capable students, then the school environment would have likely been a more positive setting for them and evoked greater levels of motivation and engagement.

The developmental context of the R4RF considers the need for tasks to link with identity, and the activity context articulates the need for tasks to have personal relevance. These two features of the R4RF support the notion that interventions aimed at improving EF post-TBI need to be embedded in meaningful activities and settings (Ylvisaker & Feeney, 1998a). This point underlines the need for rehabilitation clinicians to carefully consider the settings used to train cognitive strategies and routines post-injury.

Environments that support, or are likely to support identity development will be environments more conducive to rehabilitation efforts. If adolescents do not see themselves as students, school is the wrong setting for rehabilitation services to use. If an environment is perceived by the adolescent as neither meaningful nor relevant, intervention will probably be doomed to fail (Ylvisaker & Feeney, 1998a; Ylvisaker et al., 2003).

The activity context of a rehabilitation setting can entice and encourage participation in meaningful tasks and routines by arranging and structuring the environment to ensure task completion. Optimally challenging activities foster a sense of competence by giving adolescents opportunities to exhibit acquired skills. With the support of more
knowledgeable others, optimally challenging activities also push adolescents to stretch their understanding and skill base. The role of more knowledgeable collaborators within the activity context is crucial. To adopt an apprenticeship metaphor (Ylvisaker & Feeney, 2009), the master tradesman is needed to arrange and structure the environment so that the right level of support is available to the apprentice. Supporting adolescents to achieve mastery of their environment bolsters their sense of self and identity. An activity context that offers opportunity for involvement, the supports to be involved, and the flexible structure to learn from involvement serves to meet an innate psychological need of adolescence, a sense of competence.

The perceptions of others has been shown to be as influential as self-perception in the development of a sense of competence (Eschenfelder, 2005; Hammell, 2004). At both individual and group level, the interpersonal context can significantly influence people’s intrinsic and extrinsic motivation, cognitive, behavioural, and emotional engagement, and thus their ability to develop skills, gain confidence and achieve competence. The interpersonal context of the R4RF focuses on the need for clinicians to consider the relationships that exist within environments that may be used as settings for cognitive rehabilitation. The main premise of the interpersonal context is that skill-building and collaborative and authentic relationships, such as those that exist between a mentor and mentee, are more likely to produce motivated, engaged and self-regulated
behaviour. These relationships are also paramount in building adolescents’ confidence, competence and self-esteem.

The identified elements of the interpersonal context (role model–mentor relationships, sense of team, and co-constructed learning) are supported by the concept of bond as it is defined in the SDM. The interpersonal context is also based on the theoretical works of Vygotsky, whose social-interactionist model of cognitive development significantly influenced Rogoff’s conceptualisation of guided participation, and Ylvisaker and Feeney’s framework for contextualised rehabilitation. Drawing on all these works as theoretical support, the purpose of examining the interpersonal context of an environment is to ascertain whether collaborative relationships that use guided participation to scaffold learning experiences for adolescents with TBI exist, or can exist, within a defined setting. An environment that offers opportunities for interactions with people who can help adolescents become who they want to be; an environment that is shaped by collaborative, meaningful interpersonal exchanges that have the goal of promoting skill development; and an environment that expounds pro-social values and beliefs to guide and regulate behaviour, is an environment more likely to meet adolescents’ fundamental psychological need for a secure relational basis.

The interpersonal context of the R4RF promotes consideration of the potential of a setting to meet adolescents’ need for secure relational bases with non-parental adults, and this connects with the process of individuation included in the developmental context. The activity context
promotes consideration of the potential of a setting to meet adolescents’ need for competence; a sense that they have the opportunity for involvement and the supports to be involved in meaningful tasks. This links with the concept of self-determination in the developmental context: the opportunity to choose and exert some control over the goals being pursued (an internal locus of control) actively engages adolescents in shaping their lives (J. Heckhausen et al., 2010; Ryan & Deci, 2000b). Theories of human motivation and engagement, such as the SDM and SSPM, identify the innate psychological needs of relatedness, competence, and autonomy as influencing intrinsic motivation and behavioural, emotional, and cognitive engagement (Appleton et al., 2008; Connell & Wellborn, 1991; Ryan & Deci, 2000b). The R4RF is structured so that these innate needs are considered within the component contexts and thus considered in the development of rehabilitation programmes. Besides the interpersonal and activity contexts, the developmental context requires careful consideration in the planning and development of rehabilitation programmes, to ensure that the people, tasks and places used to deliver programmes support adolescents to become autonomous individuals with a sense of personal authority.

The clinical application of the R4RF is summarised in Table 5.2. The first row of the table summarises the main premise of each context and subsequent rows list prompt questions clinicians can ask themselves when considering each context. The responses to each question should guide clinicians in the design and development of rehabilitation programmes. For
example, if a clinician determines that a setting provides activities and
tasks that are meaningful to a particular adolescent client, and the setting
supports the identity the adolescent is striving to achieve, but the setting
does not provide sufficient support from role models or mentors for the
adolescent to experience success with tasks, then the clinician should
consider how the interpersonal context of the target setting can be
developed or enhanced so that the adolescent receives the modelling,
scaffolding, feedback and reward for effort needed to ensure motivated
and engaged behaviour and, ultimately, a sense of confidence and
competence in self.
5.9 Clinical application of the R4RF

Table 5.2: Summary of the clinical application of the R4RF

<table>
<thead>
<tr>
<th>Interpersonal Context</th>
<th>Activity Context</th>
<th>Developmental Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is widely acknowledged that learning occurs within the context of relationships (Bond et al., 2007). The interpersonal context aims to promote the positive and productive relationships adolescents engage in. Relatedness is shown to be a primary psychological need and one component in producing motivated and engaged behaviour. Positive relationships with non-parental adults are also known to regulate behaviour, prompt the desire for skill development and enable enhancement of self-esteem and confidence. As Harry and Jack clearly described their need to develop confidence prior to considering their level of competence, rehabilitation clinicians need to consider the interpersonal contexts of the environments they use for cognitive rehabilitation.</td>
<td>Ylvisaker and Feeney wrote: “in the absence of meaningful engagement in chosen life activities, all interventions will ultimately fail” (1998a, p. 37). Attending to the activity context will enable clinicians to consider how the setting provides activities that enable young people to personally effect a meaningful, purposeful outcome for self or team. Clinicians should consider the need for meaningful tasks so as to produce rewards such as a sense of pride, satisfaction, confidence, goal achievement and social acceptance, which ultimately produce an effective sense of self and enhance motivation and engagement. Ensuring that activities of optimal challenge are offered in an environment that simultaneously offers supported or guided learning is conducive to ensuring that the basic human psychological need for a sense of competence is satisfied.</td>
<td>The findings of my study indicate that clinicians working with adolescents need to understand neurological development, in particular the developmental trajectory of EF skills, but also psychological and social development including the processes of identity development and individuation. An appreciation of how rehabilitation activities can support adolescents to develop their identity status, increase their independence, and individuate from their family of origin while creating new, secure relationships with other influential adults will serve to enhance adolescents’ motivation and engagement. The principle of choice and control is well-known in rehabilitation. It influences a person’s level of participation, reduces the frequency of challenging behaviours and increases the likelihood that people will report satisfaction from the activity (Ylvisaker et al., 1998). It is more than understandable, then, that autonomy and the contextual support for it emerged as a primary need for adolescents’ engagement in</td>
</tr>
</tbody>
</table>
Clinicians need to consider:
- Who are the role models and mentors in the lives of adolescents?
- Where are these mentors located?
- How do they engage with the young person?
- Can a collaborative relationship be established between mentor, clinician, and adolescent to enable the mentor to facilitate development of EF skills in everyday, naturally occurring contexts? Is this occurring already, and does it need to be interfered with?

Clinicians need to consider:
- Is rehabilitation delivered in the right place, so that it is personally meaningful to the adolescents, where they see the connection between the task at hand, their goals, and the identity they are aiming for?
- Are the tasks, activities and the environment in which they are being delivered authentic?
- Are adolescents given opportunities for involvement?
- Do adolescents have the requisite skills to be actively engaged and have their efforts (rather than successes) acknowledged and rewarded?

Clinicians need to consider:
- Is rehabilitation, including the contexts in which it is occurring and the cognitive strategies offered and developed, supporting the adolescent to experience autonomy? Is there scope for adolescents to “take an idea and make it theirs”?
- Are the activities offered congruent with neurological developmental trajectories?
- Is rehabilitation fostering motivation through facilitating self-determination and engagement through allowing autonomy in adolescents’ choice and control over their rehabilitation programme tasks and timing?
- Is rehabilitation supporting the normal developmental processes for individuation and family differentiation?
- Is rehabilitation, through the use of appropriate settings and tasks fostering a self-identity that is compatible with adolescents’ ideas of their possible self? Is the adolescent’s ideal self achievable?

rehabilitation. Autonomy has been shown to be the third of the primary psychological needs of motivated behaviour, a developmental right of adolescence, and a foundational principle of quality rehabilitation services.
5.10 Conclusion

This chapter has synthesised the findings of this study with existing theoretical and practice frameworks to present the R4RF. The chapter has highlighted the importance of considering the ability of a setting to meet the adolescent needs of autonomy, relatedness and competence. In describing the three component contexts of the R4RF, this chapter has detailed why clinicians need to understand and include these developmental needs in rehabilitation programmes. The chapter has also detailed how application of the R4RF can positively influence adolescents’ motivation and engagement with TBI rehabilitation, and how this can build self-esteem and a sense of self-confidence and competence in executive functioning skills.
Chapter 6
Conclusion

Introduction

This research has explored the perceptions of two adolescent boys, Harry and Jack, when reflecting on how confident and competent they felt about their executive functioning skills post-TBI. The perceptions of Harry’s and Jack’s mothers were also sought about this topic, and this dichotomy of opinions provided one of the more significant findings of this study. The research adopted a mixed method approach to explore how confident and competent Harry and Jack were in their executive functioning skills, and how confident and competent their mothers were in their sons’ abilities to apply their executive functioning skills. This chapter presents the unique contributions made by this research to the field of TBI rehabilitation, its limitations, and proposed directions for future research.

6.1 Limitations of this study

The findings of this study, like all research, must be considered in light of its limitations.

a) The number of participants. The study involved two adolescents with TBI and their mothers. Recruitment of such a small number of participants means that study findings must be interpreted with caution. Purposive sampling was deliberately
used, however, as the nature of the questions researched and methodology applied meant that data was best obtained from a small number of participants. The small participant numbers were considered when designing the study, which hence incorporated a multi-phase data collection period and the use of a mixed methods approach, allowing triangulation of the data. The fact that the findings of this study align strongly with well-tested theoretical models from other fields of practice (e.g. SDM and SDT) is testament to the robustness of the study.

b) The participants were recruited from a similar geographic location and all participants had only ever received TBI rehabilitation from The Kids’ Team. This might mean that Harry, Jack and their mothers had a common experience of TBI rehabilitation not experienced by children, adolescents and their families engaged with services other than The Kids’ Team. Furthermore, the participants were all from rural Australia, and an investigation of access to specialist TBI rehabilitation services in rural Victoria, Australia, has shown that geographical distance from specialist services affected people’s healthcare journey post-injury (O’Callaghan, McAllister, & Wilson, 2010). Although Harry, Jack and their families were able to access the specialist services offered by The Kids’ Team, Harry lived within the same geographic location as the service but Jack was a significant distance from where The Kids’ Team was based.
Difference in access to service, for Harry and Jack as well as for other children and adolescents who have acquired a TBI, could influence the perceptions they report post-injury and consequently the generalisability of the study findings.

c) The adolescent participants in this study were both male. Thus, the strong attribution of each to the work environment as opposed to the school environment, as well as other perceptions associated with executive functioning and cognitive rehabilitation post-injury, might not be applicable to female adolescents post-TBI. Adolescent females’ perceptions of EF post-injury may be different from those voiced through this study. The factors that affect the perception of confidence and competence in EF post-injury may not be adequately addressed in this study, and this requires consideration when interpreting and applying the findings of this study. Attempts were made to recruit a female adolescent and carer for the study, but these efforts were not successful. In light of the total number of participants recruited, the lack of a female adolescent in the study cohort is not surprising given that Australian data from 2004-05 showed that rates of hospitalisation for males per 100,000 population were 2.5 times those recorded for females (Helps et al., 2008).

Comparative US data collected from the period 2002-06
showed rates for hospitalisation of males to be 1.4 times those recorded for females.

6.2 Unique contributions of this research

There were several unique aspects to this research

a) No other studies exploring adolescents’ perceptions of their EF skills post-TBI could be located. Although a number of qualitative studies have investigated the experience of returning to school post-injury, and some of those have touched on the impact of executive dysfunction post-injury, no studies that specifically ascertained adolescents’ perceptions of their EF skills post-injury and post-long-term cognitive rehabilitation were identified.

b) This study is unique in that it ascertained the perceptions of the adolescents’ mothers. The inclusion of primary caregivers in this study provided an opportunity to compare the perceptions of two major consumers of TBI rehabilitation, children and their parents, with respect to the same phenomenon. It highlighted the competing demands of adolescent TBI rehabilitation, with adolescents and parents focused on different outcomes from cognitive rehabilitation.

c) The study used a mixed methods approach to understand how adolescents and their mothers perceived their/their sons’ executive functioning skills post-injury. The methodology used
a combination of standard clinical and qualitative research approaches to generate data, and this combination allowed identification of the different foci of adolescents, parents and clinicians when engaging in cognitive rehabilitation.

d) This study explicitly drew together the SDM, SDT, SSPM and context-sensitive rehabilitation framework to consider holistically how TBI rehabilitation efforts can support adolescents' psychological, social and cognitive development. No other study has combined these models and frameworks and directly applied them to furthering the knowledge base of adolescent TBI rehabilitation.

e) This study has answered the call for research efforts in paediatric and adolescent TBI rehabilitation to be grounded in normal developmental theories and knowledge, so that developmentally appropriate responses to TBI can be formed rather than adopting models designed for the adult population. This study resulted in the development of the R4RF, a novel way of considering the elements required for rehabilitation programmes aimed at supporting adolescents.

6.3 Directions for future research

a) Future research from this study will begin with piloting the R4RF. This will involve applying the framework to the design and implementation of rehabilitation programmes for selected
case studies from the caseload of The Kids’ Team and then broadening this to other specialist paediatric TBI services from the Brain Injury Rehabilitation Program of New South Wales, Australia. Informal application of the framework has already commenced with The Kids’ Team, but structured and well-considered evaluation of the clinical efficacy of the R4RF is required. Evaluation of the framework particularly needs to ascertain its “user friendliness” in everyday clinical environments.

b) Given the small number of participants in this study, future research could replicate the study with wider group of adolescents with TBI. Ideally, this group would involve female and male participants as well as participants from rural and metropolitan locations.

c) The different foci of mothers and adolescents on competence and confidence in EF skills require further exploration. Again, replicating this study with a larger participant group would permit further exploration of this finding. It would also be interesting to ascertain the perceptions of classroom teachers, as per the original proposal for this research, as teachers are often the third major consumer of healthcare resources in paediatric TBI rehabilitation, beyond the child and family.

d) Application of the PPT in clinical assessment of EF skills in adolescents also warrants further exploration. The PPT proved
a useful tool in the functional assessment of EF skills in this study, as described in Shanahan, McAllister and Curtin (2011). The flexible scoring guidelines could accommodate individual responses as well as identify participants’ ability to integrate strategies. A small scale study comparing the application and interpretation of the PPT by specialist and generic clinicians might contribute to the current knowledge gap around suitable assessments for the adolescent TBI population.

6.4 Concluding remarks

The SDT hypothesises that environments need to provide supports for competence, relatedness and autonomy in order to facilitate intrinsic motivation and to allow people to move from wholly extrinsically motivated action to integrated, meaningful and personally believable action, with intrinsic motivation producing greater persistence, self-perception and quality of engagement. The SDM hypothesises that environments need to provide support for competence and relatedness in order to foster regulatory bonds with the socialising unit. Bonds, which result from adopting the socialising unit’s values and beliefs, regulate behaviour and have the potential to produce pro-social rather than antisocial outcomes. Contextualised intervention and, in particular, the apprenticeship model advocate the presence of supportive, mentoring relationships in the context of meaningful activities that support the building of competence and autonomy in executive functioning/self-
regulatory routines. Each of these theoretical works contributes to drawing together the findings of this study into the R4RF. The complexity and richness of participants’ stories yielded holistic perspectives of what confidence and competence in executive functioning skills were possible, and when they were possible. Cognitive capacity was enfolded with identity, self-determination, meaning and quality of life. Accordingly, rehabilitation models should encompass a “whole of life” perspective relevant to the person’s stage of life.

I embarked on this study wanting to know if the cognitive rehabilitation I was providing was having a valuable impact for the children and adolescents with whom I was working. It seemed logical to ask adolescents with whom I had worked if they felt confident and competent in their executive functioning skills following the many hours we had spent together developing these skills and associated compensatory strategies. I wanted to know what was being done well, and more importantly, what could be done differently. The responses I obtained from Harry and Jack and their mothers surprised, pleased, excited, but most significantly, humbled me. Harry and Jack told me what helped and what didn’t help. They did not do this in the direct, simple manner I had imagined, but rather, through a tapestry of stories, emotions and a few frank admissions. When I embarked on this study, I did not ever imagine the depth of information I would obtain from such a small cohort; I did not imagine that two adolescents, who I knew had significant cognitive and communication
impairments, could articulate complex psychological, social and
developmental needs as they did; and I did not imagine that one of the
most significant findings of this study would be the realisation that
paediatric TBI clinicians are walking a tightrope of competing demands
when it comes to delivering the outcomes adolescents and parents want
from rehabilitation following a TBI. I am pleased that I did not imagine all
these things at the outset, for discovering them along the way has
expanded, fuelled and rounded the joy I get from working alongside
children, adolescents and parents learning to live with TBI. For me, it has
cemented my belief in the value of collaborating with everyday people and
working with adolescents when they are “ripe for rehab”.

This study findings presented in this exegesis, supported by
documentation found in the accompanying portfolio, highlight the need for
clinicians to consider when, where and who engages with adolescents at
various points of rehabilitation following a TBI. The practice framework
that has been developed in response to these findings is an attempt to
draw the key concepts together in a clinically applicable tool. The R4RF
illustrates the importance of considering the three core psychological
needs of adolescence – autonomy, relatedness and competence – and
ensuring that any rehabilitative effort strives to support the development of
self-esteem, confidence and competence.


