Identification of gifted students at risk of underachievement using ROC curve analysis; using an understanding of the relationships and patterns of social coping, attitude toward school, and self-efficacy to identify underachieving gifted students: An Australian sample

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Professor Wilma Vialle & Dr. Steven J. Howard

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School of Education
June 2017
Declaration

I, Ruth Amy Phillips, declare that this thesis submitted in partial fulfilment of the requirements for the conferral of the degree Doctor of Philosophy, from the University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. This document has not been submitted for qualifications at any other academic institution.

Ruth Amy Phillips

June 29, 2017
Abstract

Underachievement in gifted individuals is a significant concern in the field of gifted education, a field which focuses mainly upon development of talent in individuals with high potential. The complexity of the factors which influence whether an individual is likely to underachieve has made it difficult to determine why it is that some gifted students do not fulfil their ‘potential’. As such, being able to better understand the factors that influence underachievement in different contexts and more effectively identify individuals who are likely to underachieve within the school system may make it more likely that the underachievement can be addressed and that more gifted students may reach their identified potential. This study used a combination of the School Attitude Assessment Survey-Revised (SAAS-R), the three subscales of the Self-Efficacy Scale for children, the two reliable subscales of the Social Coping Questionnaire and the academic achievement of identified groups of gifted achievers and gifted underachievers to investigate the relationship between these factors and achievement level, in a self-contained gifted/selective environment within an Australian setting. The study sought to understand the way in which gifted achievers and underachievers in academically selective or ability grouped classes differ in their attitudes toward school; attitudes toward teachers; goal valuation; motivation/self-regulation; academic self-perceptions; academic, social and emotional self-efficacy; and the social coping strategies of denying giftedness and using humour. The study also examined the relationships between these factors in underachievers and achievers to understand the way these factors cluster. Additionally, this study assessed the use of the instruments as predictive of the students being identified as either gifted achievers or gifted underachievers with 80%
accuracy, using logistic regression techniques. Further, the study examined the role of gender and school type in the patterns of underachievement and achievement within an academically selective/self-contained gifted context. The sample included a total of 595 identified gifted students with 477 gifted achievers and 118 gifted underachievers in grades 7, 8 and 9 from eight high schools with academically selective or self-contained gifted classes in New South Wales (NSW), Australia. The study showed differences between achievers and underachievers that were statistically significant in their goal-valuation, motivation/self-regulation, attitude toward teachers, academic self-perception, academic self-efficacy, denying giftedness and use of humour. Attitude toward school, as well as social and emotional self-efficacy, were not found to be statistically different for achievers and underachievers. A correlational analysis found that underachievers and achievers differed in the relationships between goal valuation and attitude toward teachers and school, motivation/self-regulation, and denying giftedness and social self-efficacy and attitude toward teachers. Using logistic regression analysis techniques, the researcher found that 81.8% of the participants in the study were correctly identified as gifted achievers or gifted underachievers in relation to their motivation/self-regulation and social self-efficacy factors as well as the gender and school type variables. The scales were assessed for their usefulness as a diagnostic tool for identifying students vulnerable to underachievement. Results suggest that three factors from the scales are useful for diagnosis of vulnerability to underachievement, these being motivation/self-regulation, social self-efficacy and denying giftedness, combined with the demographic indicators of gender and school type. These findings have significant implications for the field, enabling educators to proactively identify individuals vulnerable to underachievement using the survey instrument constructed for this
study. This means that schools will be able to provide interventions for such individuals on entry to gifted programs and possibly reduce the prevalence of underachievement in this population.
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### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Self-Perception</td>
<td>Students’ perceptions of their scholastic abilities.</td>
</tr>
<tr>
<td>Attitude Toward Teachers</td>
<td>Students’ interest and positive affect toward their teachers and their classes.</td>
</tr>
<tr>
<td>Attitude Towards School</td>
<td>Students’ interest in and affect toward school.</td>
</tr>
<tr>
<td>Academic Self-Efficacy</td>
<td>Students’ ability to succeed in school and display appropriate learning behaviours.</td>
</tr>
<tr>
<td>Denying Giftedness</td>
<td>Behaviours which gifted students use to deny that they are gifted.</td>
</tr>
<tr>
<td>DMGT</td>
<td>Developmental Model of Giftedness and Talent.</td>
</tr>
<tr>
<td>Emotional Self-efficacy</td>
<td>Students’ capability to regulate unpleasant emotions.</td>
</tr>
<tr>
<td>Gifted Underachievement</td>
<td>The lack of achievement by students with exceptional potential, or ‘underachievement’, can be defined as a difference between identified potential and current performance using some form of benchmark to establish potential.</td>
</tr>
<tr>
<td>Goal Valuation</td>
<td>The importance a student attaches to scholastic achievement.</td>
</tr>
<tr>
<td>Full-time Ability Grouping</td>
<td>Within school structural organisation of identified gifted students, according to ability and performance. Students remain within this grouping structure for the whole of the school day.</td>
</tr>
<tr>
<td>ICSEA</td>
<td>“The index of community socio-educational advantage (ICSEA) was created by the Australian Curriculum, Assessment and Reporting Authority (ACARA) specifically to enable meaningful comparisons of National Assessment Program – Literacy and Numeracy (NAPLAN) test achievement by students in schools across Australia.” (ACARA, 2017)</td>
</tr>
<tr>
<td></td>
<td>“Key factors in students’ family backgrounds (parents’ occupation, school education and non-school education) have an influence on students’ educational outcomes at</td>
</tr>
</tbody>
</table>
In addition to these student-level factors, research has shown that school-level factors (a school’s geographical location and the proportion of Indigenous students a school caters for) need to be considered when summarising educational advantage or disadvantage at the school level. ICSEA provides a scale that numerically represents the relative magnitude of this influence, and is constructed taking into account both student- and school-level factors.” (ACARA, 2017)

<table>
<thead>
<tr>
<th>Motivation / Self-Regulation</th>
<th>Students’ effort and use of self-regulatory strategies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td>Individuals’ judgements about their ability to engage in, perform and succeed in particular tasks and actions (Bandura, 1977).</td>
</tr>
<tr>
<td>Social self-efficacy</td>
<td>Students’ ability to relate and get along with other peers</td>
</tr>
<tr>
<td>Use of Humour</td>
<td>Gifted students' self-reported use of humorous strategies, such as telling jokes, being the class clown, to make themselves more socially included</td>
</tr>
<tr>
<td>SAAS-R - School Attitude Assessment Survey – Revised</td>
<td>A 43-item self-report survey that measures attitudes towards school and teachers, academic self-perceptions, motivation and self-regulation, and goal valuation. Participants complete the questionnaire by responding to the items on a 7-point Likert scale.</td>
</tr>
<tr>
<td>SEQC</td>
<td>The Self-Efficacy Questionnaire for Children is a 21-item self-report instrument intended to measure adolescents’ beliefs about their competencies in three areas: social, academic and emotional.</td>
</tr>
<tr>
<td>SCQ</td>
<td>Social Coping Questionnaire - This survey assesses students’ beliefs and actions related to various social aspects of being academically gifted, in the form of social coping strategies.</td>
</tr>
<tr>
<td>Selective High School</td>
<td>A public school which is part of the NSW Department of Education school system. Selective high schools aim to cater for gifted and talented students who have</td>
</tr>
</tbody>
</table>
superior to very superior academic ability which is matched by exceptionally high classroom performance. Year 7 entry into a selective high school is determined by a student's results on the Selective High School Placement Test in English (including reading and writing), mathematics and general ability. Additional information is provided from the student’s primary school assessment of their performance in English and mathematics.
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Chapter 1. Introduction

“People’s behavior makes sense if you think about it in terms of their goals, needs and motives.” – Thomas Mann (1875-1955)

1.1. Context of Study

The provision for intellectually gifted learners in Australia has a chequered history, with a prevalent reluctance to provide for these learners, a persistent perception of elitism, and inconsistent policy provisions (Braggett & Moltzen, 2000; Geake & Gross, 2008; Gross, 1999, 2003; McCann, 2005; Plunkett & Kronborg, 2007). The performance of Australian students has declined year on year, in comparison to other students internationally, on reading, numeracy and scientific literacy measures used by the Organisation for Economic Cooperation and Development (OECD) Program for International Student Assessment (PISA) (Thomson, De Bortoli, & Underwood, 2016). This decline has led to a focus on the way that we provide for all students, but has also shone a light on how we are failing our gifted. An examination of the results has highlighted that whilst the same proportion of high ability students participate in the PISA assessment program, there has been a significant deterioration in achievement of Australia’s high achieving or gifted students. An analysis of performance of students achieving levels 5 and 6 (considered to be high achievement), results indicate that the percentage of students considered to be achieving at a high level, level 5 and above on the 1-6 scale fell from 18% in the 2000 PISA assessments to 13% in 2009 and to 12% on PISA scores in 2012 and then to 11% on PISA scores in 2016 in reading literacy. Similarly, the percentage of students achieving Level 5 and higher (on a scale of 1-6) in
mathematics declined significantly from 20% in the PISA assessment in 2003 to 16% in the PISA assessment of 2009 and a further decline to 15% in 2012 (Thomson et al., 2011, 2012) and then to 11% in 2016 (Thomson et al., 2016); a worrying trend for our education system. The scientific literacy reflects a similar downward trend with the percentage of students achieving at the highest levels declining from 15% in 2006 to 14% in 2012 and most recently to 11% on PISA scores in 2016. The most recent PISA results suggest that the performance of Australia’s gifted is not only declining when compared with international peers, but also when compared with performances of previous Australian cohorts. This trend is common to all sectors of the Australian schooling system; public, private and Catholic (Thomson et al., 2016). There are many possible reasons for this decline including that other nations have improved their results whilst Australia may have remained static. However, in the field of gifted education, researchers and educators see these results as a reflection of the lack of appropriate provision of programs for our gifted students, which thereby create environments in which gifted students underachieve (Braggett, 1985, 1996, 2000; Collins, 2001; McCann, 2005; Plunkett & Kronborg, 2007). It seems logical that the underachievement of gifted students in Australia should be of concern to educators, as we are not only failing to educate these students appropriately, but these results affect the international standing of our education system at a time when this is one of our greatest exports (Pyne, 2015).

Within the NSW context specifically, the PISA report also highlights that NSW results in mathematics and literacy have declined significantly, as NSW did not rate in the top three states on any of the measures despite having the highest number of selective high schools and ‘opportunity class’ primary school gifted programs in Australia’s public education sector.
These results suggest that understanding the extent and nature of underachievement of the gifted students in these programs may be of significant benefit to the students individually, but also to the state of the nation’s achievement overall (Thomson et al., 2016).

Research suggests that educators tend to believe that gifted students achieve high academic results without support (Goldberg, 1981), and as such a focus on high ability students is not seen as necessary. Since Goldberg’s study, research has continued to highlight a persistent lack of support for a consistent approach to gifted education in policy and practice (Braggett, 1985, 1996, 2000; Commonwealth School's Commission, 1981; Goldberg, 1981; Gross, 1999, 2003; Lassig, 2009; McCann, 2005; Plunkett & Kronborg, 2007; Vialle & Geake, 2002). Culturally, it has been noted that the Australian sense of egalitarianism and the “tall poppy” syndrome (Gross, 1999), an Australian notion in which individuals who achieve conspicuous success are reviled and ‘cut down’ in order to restore the equality so craved in Australian culture (Peeters, 2004), may be an obstacle for Australian schools to engage fully with providing appropriate learning experiences and environments for gifted learners. Further to this there is evidence that the approach to gifted education in Australia has been at best ad hoc and inconsistent (Collins, 2001; Forster, 2005; Merrotsy, 2003). The perception that gifted students will make it on their own does not explain the presence of underachieving gifted students within school systems. The fact that Australia has not consistently supported gifted students means that underachievers are particularly vulnerable.

Despite the inconsistency of response, the New South Wales Department of Education and Training (NSW DET), introduced a mandatory, revised gifted and talented policy in 2004 (Department of Education and Training, 2004). This policy mandated that schools needed to have a gifted and talented program and that principals and teachers needed
to take responsibility for gifted programs in schools. Within the document, underachievement is directly defined and addressed as an issue for schools to deal with. The policy mandated that schools have a gifted and talented committee, appoint appropriately trained teaching staff (including a gifted coordinator), and put into place programs and processes to identify and support gifted students (Department of Education and Training, 2004). Additionally, the Sydney Catholic Diocese adopted a system-wide policy aimed at addressing the needs of gifted students within its schools (Catholic Education Office Sydney, 2014) and independent schools adopted gifted policies and programs to compete with selective schools. Even with policy guidelines and directives, the provisions for gifted students and, in particular, underachieving gifted students remains inconsistent. This is the case even within fully academically selective schools, contexts in which all students attending these schools have been identified as being gifted and talented. Gifted students within the NSW school system face challenges of teacher knowledge and attitudes, and access to appropriate learning experiences. In addition to the system challenges, these gifted students report feeling socially different to their typical aged peers, thereby creating an environment in which gifted students may find it hard to maintain high performance.

These challenges are made more difficult for gifted underachieving adolescents. Adolescence is a time of rapid physical, psychological and cognitive changes. Adolescents develop a unique and lasting understanding about themselves (Erikson, 1968), the way in which the world works and about their place in the adult environment (Keating, 2004). During this time adolescents become more aware of their individuality, gain more insight into what is perceived as ‘normal’ and develop an understanding of their identity. This identity development is multifaceted and includes the development of an individual’s identity
in terms of their relationship to others as well as consolidating their beliefs about their self-efficacy in different domains of competence.

As adolescence is a time in which individuals feel the need to identify which of these differences are acceptable and which differences cause social isolation and rejection, it is a time where belonging and group identification become increasingly important. The adolescent need to belong, particularly within the school setting, suggested in much research (Baumeister & Leary, 1995; Goodenow, 1993a; Roeser, Midgley, & Urdan, 1996; Samdal, Wold, & Bronis, 1999) means that for an adolescent at school, the perception that one is different is a challenging obstacle. Humans can identify difference in other individuals from a very early age and as we get older we are more able and likely to identify those who do not belong as a result of stigmatised difference. Children as young as eight can recognise that an individual belongs to a stigmatised group, and this increases dramatically so that by age 10, 90% of children can recognise a group as being stigmatised (McKown & Weinstein, 2003). There are a number of identifiable differences which can connect or isolate the adolescent, including physical appearance, intellectual ability and group adherence.

Gifted students have reported that high intellectual ability is a difference which can be responsible for social isolation, and this phenomenon increases in adolescence (Brescher & Highman, 1987; Colangelo & Dettman, 1983; Cross, Coleman, & Stewart, 1993; Janos, Fung, & Robinson, 1983; Manaster, Chan, Watt, & Wieche, 1994; Manor-Bullock, Look, & Dixon, 1995). Gifted students also report their high performance being envied by others and as an isolating factor (Masse & Gagné, 2002). The concern with the isolation of gifted individuals is that it may result in the desire to moderate their performance in order to be accepted, or face “the forced choice dilemma”, a phenomena whereby gifted individuals feel...
that they have to choose between achieving excellence or having friends (Gross, 1989; Jung, McCormick, & Gross, 2012).

In order to deal with the perceived stigma of being gifted, individuals employ social coping strategies to manage the perception of others about them (Manor-Bullock et al., 1995). This concept has been explored in research by Swiatek (1995) the author of the Social Coping Questionnaire to identify the strategies gifted students use. Research on these social coping strategies has found that underachievers use negative social coping strategies more often than achieving students (Chan, 2001, 2003b, 2004, 2005; Swiatek, 1995, 2001, 2002; Swiatek & Cross, 2007; Swiatek & Dorr, 1998).

When examining underachievement, we should not only focus on the social and emotional elements but also must examine attitudinal factors, such as attitudes toward school, self-efficacy, and social coping techniques that gifted students engage to navigate the world of school. An individual’s performance can be moderated by many influences including self-efficacy, self-regulation and motivation. One of the strongest influences on human success is their belief about their ability to engage in the task, or self-efficacy (Bandura, 1982). Research into this area has identified that an individual’s self-efficacy can influence performance in almost any area of human endeavour, from social interaction to perceived physical competence, career choice and academic achievement (Bandura, 1982, 1993; Multon, Brown, & Lent, 1991; Pajares, 1996b; Pajares & Schunk, 2001c; Zimmerman, 1999). An individual’s self-efficacy beliefs about their ability to interact with others impact on many facets of their lives, including academic performance, vulnerability to depression, and self-esteem (Blai, 1989; Comunian, 1989; Ehrenberg, Cox, & Koopman, 1991; Felsman & Blustein, 1988; Junge & Dretzke, 1995; Rotenberg & Morrison, 1993). Muris (2001)
developed a questionnaire to measure children’s self-efficacy, which examines academic self-efficacy, social self-efficacy and emotional self-efficacy.

Another significant influence on success is the way in which individuals regulate their own learning behaviours, or ‘self-regulate’. Within the social-cognitive approach (Bandura 1977, 1986; Zimmerman 1989, 2000a), self-regulation is viewed as an interaction between personal, behavioural, and environmental processes. Academic self-regulation has been linked to academic success and lack of it, to academic underachievement (Zimmerman, 1989, 1998a, 1998b, 2008). Motivation is an essential element for success and students who underachieve need support to move from extrinsic motivation in the school context to intrinsic motivation (Gottfried & Gottfried, 1996; McCoach & Siegle, 2005). The School Attitudes Assessment Survey - Revised (SAAS-R), developed by McCoach (2002), assesses students’ levels of self-regulation and motivation.

1.2. Statement of Problem

Gifted students failing to achieve their academic potential within the school setting have long been documented as a concern for educators of the gifted. The identification of the causes of underachievement and behaviours exhibited by this population has challenged educators in this field, as the reasons for underachievement are not yet completely understood and seem to be complex. The causes of underachievement and the ability to accurately predict whether an identified gifted student will become an underachiever is something which would benefit educators of the gifted, enabling earlier detection and more efficient implementation of appropriate support mechanisms. An investigation into the factors that relate to
underachievement in an Australian schooling context will enable educators in Australia to better address underachievement in our gifted students.

1.3. The Purpose of the Study

This study will build on previous studies to enhance our understanding of the phenomenon of gifted underachievers, the reasons for that underachievement and the way in which the behaviour of these individuals reflects their achievement or lack thereof. In this study, the focus will be on the attitudes of gifted students towards school, their self-efficacy and the strategies that adolescents use to minimise the stigma of high intellectual ability. It will do so through a comparison of achieving and underachieving gifted students in an Australian context. Understanding of the relationships between these factors of self-efficacy, attitude toward school and social coping strategies, and the patterns of difference between achievers and underachievers, is currently limited, particularly in the Australian context. These factors have been linked to academic achievement and specifically linked to underachievement in gifted students (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Bogie & Buckhalt, 1987; Brophy, 1988; Gottfried, 1985, 1990; Gottfried & Gottfried, 2004; Gresham, 1988; Legault, Green-Demers, & Pelletier, 2006; McCoach & Siegle, 2003a; Multon et al., 1991; Nist, Simpson, & Olejnik, 1991; Pajares, 1996a, 1996b; Pittman, Boggiano, & Ruble, 1983; Schunk & Zimmerman, 1998; Zimmerman, 1990, 1998, 2008; Zimmerman & Bandura, 1994; Zimmerman & Martinez-Pons, 1990).
1.4. The Significance of the Study

This study is significant in NSW as there are many schools that are identifying and grouping gifted students. There has been a significant rise in the quantity of partly selective high schools and places for gifted and talented students in these schools, in recent years. As of 2015, there are 17 fully selective high schools, 25 partly selective high schools, 4 selective agricultural high schools and 1 virtual selective high school. Additionally, the Catholic Education System has embarked on creating discrete classes for gifted students within the Sydney Diocese, as are individual schools within the Broken Bay Catholic Diocese and Independent Schools within NSW. Despite the numerous schools with gifted classes and the long tradition of selective high schools in NSW, results of gifted students in NSW are sliding when compared with other states in Australia; further, Australian gifted students’ results are declining when compared with other developed nations. This is compounded by the misunderstanding amongst education practitioners and policy makers about the needs and behaviours of gifted students (Lassig, 2009; McCann, 2005; Plunkett & Kronborg, 2007). Additionally, underachievement seems to increase in the middle school years, and as such, the focus of this study in the middle years of schooling will help to understand the nature of underachievement amongst the gifted in an Australian context. Understanding the relationships among these factors may provide solutions to support students who may be underachievers within the early or middle years of high school. The study is also significant in that research with this specific focus has not previously been completed in an Australian context, and as such, may help to provide additional information about the social behaviours of gifted students in the Australian context with the aim to better understand of the real needs of these students.
Chapter 2. Literature Review

This chapter reviews relevant literature, comprising four areas of research: (1) different conceptions of giftedness and talent; (2) the factors correlated with underachievement (i.e., academic self-perception, attitude toward school, attitude toward teachers, goal valuation, motivation/self-regulation, self-efficacy and social coping in gifted students); (3) underachievement in gifted students; and (4) the social-cognitive framework that will frame this research study. These areas correspond to focus of the current study, and are included to contextualise the research, explain the definition and conceptions of giftedness and talent and identify the operational definition most appropriate for this study. The relation of academic achievement to academic self-perception, attitudes toward teachers and school, goal valuation, motivation/self-regulation and self-efficacy will be examined in the context of giftedness, using a social-cognitive theoretical framework. Specifically, social coping strategies developed from the psychological stress perspective will be examined to better understand the prevalence of social coping behaviours in the gifted achieving and underachieving populations. Finally, research on (under)achievement in gifted and talented students, and the factors that contribute to this phenomenon, will be appraised to contextualise the factors assessed in this study.

2.1. Conceptions of Giftedness and Talent: Definitions of Ability and Performance

There has been significant ongoing discussion in the field of gifted education regarding the conception of giftedness and talent. After decades of discussion the field still has not come to a consensus about the precise meaning of these terms (Bines, 1991; Coleman,
The challenge is that giftedness, like many constructs in psychology and education, is elusive and controversial (Csikszentmihalyi, 1986; Gagné, 2004; Gallagher, 1996; Gardner, 1999; Renzulli, 2010; Sternberg, 1997). Currently the debate regarding definitions is based around essentialist versus developmentalist views, according to Dai (2009). Specifically, within this debate there remain disagreements about whether giftedness and talent refer to aptitude or achievement (i.e., giftedness is the potential to achieve while talent is the achievement itself, or the terms are synonymous), and whether giftedness and talent are general or specific abilities (i.e., the conceptions are general and related to psychological constructs such as ‘g’, or there are different domains of ability and achievement). There are also different views regarding whether giftedness represents a quantitative difference that can be measured such as through an IQ test or whether the difference is more qualitative, which is more difficult to measure but which focuses on being descriptive of the characteristics. Similarly, there are differences in the conceptions of giftedness regarding the importance of creativity: some theorists see giftedness as related to the creative approaches of an individual; others focus upon the development of expertise through consistent practice and effort: and some theorists combine both into their conception of the nature of giftedness and talent. Both in the theoretical discussions and practical application of the definitions of giftedness, the nomothetic versus idiographic debate focusses on whether giftedness and talent are objectively measurable traits or whether they are subjectively observable characteristics (Dai, 2010). Within this framework, there are questions as to whether we should see giftedness through a reductionist or emergent lens. The reductionist lens is when the theorist reduces the phenomenon into its simplest elements to understand it, while the emergent view is
derived by examining the complexity of the phenomenon’s parts and stating that no element can be seen without the other elements.

There are several definitions to explain the construct of giftedness and talent. These definitions have developed in the context of changing conceptions of intelligence and ability throughout the 20th century, beginning with Terman’s focus on IQ being the single measure of intelligence in 1916 and expanding to include broader conceptions of intelligence which articulate that intelligence cannot be seen through this lens alone. As such, in the 1980s and 1990s, theorists began exploring more complex views of intelligence in which intelligence contained multiple factors. This changing view of intelligence has influenced the way in which researchers have viewed giftedness and talent, and whilst intelligence is one aspect of giftedness and talent, newer definitions include other elements including creative, social, and physical dimensions. Despite these changing paradigms, nearly all definitions of giftedness and talent suggest that ability is evident through some form of measurable performance or achievement that is valued in a social or cultural milieu.

Definitions range from those that state that giftedness, talent and prodigious achievement are synonymous (Csikszentmihalyi & Robinson, 1986) to others that state that a gifted individual must be of above-average intellectual capacity, creative and motivated (Renzulli, 2010). Some definitions focus on abilities being in different domains and link these domains to different expressions of intelligence into multiple domains (Gagné, 2004, 2008), whilst others focus on the individual’s ability to deal with environmental changes in various contexts to be successful. Sternberg’s (2000) theory suggests that a person’s use of three forms of intelligence is not only a result of simply having high intelligence in one or more of these intelligence domains, but on how well they balance against each other. Through
metacognition, an individual decides what mode of thinking is appropriate under certain conditions that reflect the context, including analytical thinking (planning, monitoring, reflection, and transfer); creative thinking (developing, applying new ideas, and creating solutions); and practical thinking (the selecting and shaping environments and experiences in the real world) (Sternberg, 2000). Other models propose that giftedness is manifested as an individual’s response to the environment, with the individual’s actions, goals and responses shaping the development of giftedness (Ziegler, 2004). Still other models take a developmental approach to giftedness. The Gagné Developmental Model of Giftedness and Talent (DMGT), for instance, explicitly differentiates giftedness from talent. According to this model, giftedness refers to aptitude or inborn ability, while talent is the result of that ability being honed through learning, training and practice (Gagné, 2004, 2008). Importantly, this model reflects broadening notions of ability and suggests that giftedness can be seen in multiple domains, not just that of the intellectual; and that the expression of talent, too, reflects these different domains.

The definition used for the purposes of this research is Gagné’s model of giftedness (potential) and talent (performance). This model was adopted for this study both for contextual reasons (Gagné’s definition has been adopted by the New South Wales Department of Education, the Sydney Diocese of the Catholic Education Office and many independent schools throughout Australia) and its utility as a model to explain underachievement. The common adoption of this definition in NSW makes it especially useful, as it is used to determine the way in which students in the study’s pool are identified as gifted within their schooling systems. Operationally, the model is constructed in a manner that helps to explain the mechanisms that account for the existence of the gifted
underachiever. Further, it allows for the underachieving gifted individual to be seen within the developmental process of talent to account for varying levels of achievement of gifted individuals within the school context. Whilst no definition of giftedness and talent can truly encapsulate the entirety of human ability, Gagné’s DMGT enables educators to conceptualise the impact of various environmental factors and intrapersonal elements as well as conceptualise their role within the talent development process. The model provides a framework to articulate the process necessary for the development of talent, considering the complexity and uniqueness of the many factors that influence outstanding performance or lack thereof.

Gagné’s DMGT model proposes that the top 10% of the population are gifted, in contrast with more conservative models that propose that only 1%–5% of the population are gifted. In his model, Gagné (2004, 2008) distinguishes between giftedness (i.e., innate natural aptitudes) and talent (i.e., development of those aptitudes into exceptional-level skills, abilities or competencies). The development of talent requires an individual to engage in systematic learning, training and practice to develop an exceptional level of competence in a specific area of performance or expertise. In this process, the development of talent is influenced by the environment in which the individual lives and the personal qualities of that individual. This model thus provides a framework to explain those individuals who exhibit early precocity or giftedness, but then fail to ‘realise’ this potential for high performance, and therefore underachieve later in schooling and adulthood.

Gagné’s (2004, 2008) operationalised model of talent development outlines the influence of environmental and intrapersonal factors (catalysts), as well as a developmental process, on the development of gifts into talent (see Figure 2.1). Specifically, in defining the ‘gifts’ that
precede talent, Gagné (2004, 2008) views giftedness as founded in two specific domains: Mental and Physical. Within these domains, Gagné further defines several sub-domains. The Mental Domain is divided into intellectual, creative, social and perceptual sub-domains, whereas the Physical Domain is divided into muscular and motor control sub-domains. Gagné’s model includes the notion of a developmental process that supports the development of gifts into talent. According to the DMGT, this developmental process involves the activities an individual undertakes (including informal and formal learning experiences), the progress they make (including one’s maturation) and the investment in this development. This developmental process is influenced by many different life experiences, which Gagné refers to as catalysts. These catalysts can enhance or inhibit the developmental process. Specifically, environmental catalysts include the milieu (i.e., the physical, social and cultural environment), individuals (e.g., teachers, parents) and provisions (e.g., educational experiences) that surround the gifted individual. The DMGT similarly includes intrapersonal catalysts (e.g., self-management, motivation, personal characteristics) as variables that contribute to the development of gifts into talents. Unlike other models, Gagné (2004, 2008) deliberately differentiates between giftedness and talent to explain the differences in an individual’s development and context. The model thus suggests that exceptional performance is a result of a unique combination of catalysts and engagement that contribute to the development of talent or high performance as a direct result of engaging in the developmental process.
2.2. Gagne’s DMGT Model and Underachievement

Giftedness, as defined by many researchers including Gagné (Gagné, 2004, 2008), does not ensure exceptionally high levels of academic performance. This is because, according to the DMGT, exceptionally high levels of performance require the systematic development of skills and competencies that are shaped by factors such as the environment (e.g., educational experiences) and intrapersonal factors (e.g., self-regulation, motivation, self-efficacy and self-discipline (Reis, Hebert, Diaz, Maxfield, & Ratley, 1995). The development of high levels of performance is also influenced by what Sternberg (1991) defines as practical intelligence, or the capacity to work out how to succeed in a given setting and environment.
In Gagné’s model of giftedness and talent, underachievement thus amounts to an individual not being able to develop their gifts into talent, resulting from interferences within the individual’s developmental process. In such cases, intrapersonal, environmental and contextual catalysts combine to create a context that can lead to underachievement. These catalysts are unique to each individual and as such, in Gagné’s model, talent (or high levels of achievement) is not assured for those identified as having high levels of potential. The focus of this research will be on the influence of the intrapersonal catalysts, specifically those associated with goal management, attitudes, and beliefs, in the context of an ability-grouped schooling environment, on underachievement in identified gifted students.

2.3. Conceptions of Achievement and Underachievement in Gifted Students

Achievement, or lack thereof, among the gifted has been the focus of much research (Balduf, 2009; Colangelo, Kerr, Christensen, & Maxey, 2004; Ford, 1996; Grobman, 2006; Matthews & McBee, 2007; McCoach & Reis, 2000; Ritchotte, Matthews, & Flowers, 2014; Rubenstein, Siegle, Reis, McCoach, & Burton, 2012a; Smith, 2005; Snyder & Linnenbrink-Garcia, 2013; Speirs Neumeister, 2003; Wellisch & Brown, 2012; Whitmore, 1980). The lack of achievement by students with exceptional potential, or ‘underachievement’, can be defined as a difference between identified potential and current performance using some form of benchmark to establish potential (Dowdall & Colangelo, 1982; McCoach & Reis, 2000; Whitmore, 1980). The extent of the problem can be seen in the reported percentage of gifted students who will underachieve academically, with estimates ranging anywhere from 15%–40% by some researchers (Seeley, 1993) to 50% by other researchers (Hoffman, Wasson, &
Christianson, 1985; Rimm, 1995). Research thus emphasises that the common conception that gifted students will achieve despite their educational context is actually a profound misunderstanding (Farkas & Duffet, 2008; Fiedler, Lange, & Winebrenner, 2002).

This importance of understanding factors contributing to gifted underachievement is underscored by the impact of underachievement on subsequent success. For instance, one study found that among college students, 52% of identified underachievers finished college compared with 83% of achievers (Peterson, 2000). This supports the assertion by those who posit that prior achievement is one of the best indicators of later performance, and that one of the best ways to find underachievers is to look for early drops in achievement levels (e.g., Gagné, 2004). In line with this suggestion, the onset of gifted underachievement appears to be most prevalent in the middle school years (Heacox, 1991; Lepper, Corpus, & Iyengar, 2005; Peterson & Colangelo, 1996). Research suggests that underachievers in high school and middle school were often identified as achievers during primary or elementary school (Peterson, 2001; Zabloski & Milacci, 2012). This suggests that identifying the causes of the onset during the middle years is important. Yet there are conflicting reasons given for the onset of underachievement at this age, with attributions related to curriculum, including puberty (Martin & Steinbeck, 2017), the increase in difficulty of the curriculum (Diaz, 1998), or even boredom with the middle school curriculum and a lack of challenge (Balduf, 2009; Kanevsky & Keighley, 2003; Reis & Renzulli, 2010; Snyder & Linnenbrink-Garcia, 2013). Underachievement in this period of schooling is also linked to social influences such as the peer pressure to hide giftedness and conform to address the desire for social acceptance (Bailey, 2011; Jung et al., 2012; Swiatek, 2001, 2002).
Researchers have some idea of when gifted students are more likely to begin to underachieve; however, they are less agreed on the causes of that underachievement. Whitmore's (1980) landmark longitudinal study was the first to focus on the variables that can lead to underachievement, such as environmental and personal factors. This study investigated characteristics of students identified as both gifted (as identified by their high IQ) and underachieving by at least one year below their grade level in reading, mathematics or English. Results indicated that the students had low self-esteem, negative attitude toward school, poor motivation and lack of self-regulation (Whitmore, 1980). Through a series of case studies and a longitudinal study of a program designed for gifted underachievers, Whitmore provided clear recommendations regarding the needs of underachieving gifted students. Whitmore’s insights prompted research to explore the nature of underachievement with the case studies highlighting the differences between the perceptions of underachievers and achievers in relation to the impact of enviro-social variables such as peer acceptance and social engagement. Additionally Whitmore’s work led to a focus on the relationship between attitudes to learning, school and teachers as well as internal drivers such as self-efficacy, goal valuation and academic self-perception, motivation and self-regulation (Diaz, 1998; McCoach & Siegle, 2001; McCoach & Reis, 2000; Ritchotte et al., 2014).

Researchers of gifted underachievement have more recently focussed on understanding the attitudes and perceptions of individuals who have been identified as underachievers, in order to inform educational intervention (Schultz, 2002; Speirs Neumeister, 2003). Although this area of research remains relatively under-investigated, there is now mounting research regarding the factors likely to contribute to underachievement (and thus potential targets for intervention).
Whilst achievement and the factors that influence it are unique, there are common factors that can contribute to a gifted student’s likelihood to be an achiever or an underachiever. Key internal factors that research has found to be associated with underachievement in gifted students include: low intrinsic motivation and self-regulation, whereby individuals lack the ability to focus and manage themselves in a way that is conducive to high achievement (Dai, Moon, & Feldhusen, 1998; McCoach & Siegle, 2003a; Midgley, Kaplan, & Middleton, 2001; Ruban & McCoach, 2005; Weiner, 1992), low valuation of school-related goals (McCall, Evahn, & Kratzer, 1992; McCoach & Siegle, 2003a), low academic self-perception (McCoach & Siegle, 2003a; Ruban & McCoach, 2005), negative attitudes toward school and teachers (McCoach & Siegle, 2003a; Ritchotte et al., 2014) lack of belief in their academic skills (Schunk, 1995; Supplee, 1990; Whitmore, 1980) and low self-efficacy (Pajares, 1996a; McCoach & Siegle, 2003a). Social connection and the need to ‘fit in’ are also reported influences on underachievement (Adams-Byers, Whitsell, & Moon, 2004a; Chan, 2003a; Gross, 1989; Jung et al., 2012). The perceived need to conform socially has been suggested as a cause of gifted individuals developing special coping strategies to enable them to better fit in socially or compensate for the perceived social isolation (Gross, 1989, 1999; Jung, Barnett, Gross, & McCormick, 2011; Jung et al., 2012; McCoach & Reis, 2000; Swiatek & Dorr, 1998). The relationship of these factors to underachievement is well established; however, there is little research within an Australian gifted class or selective school context and as such understanding the impact of different contexts on gifted underachievement is useful to adjusting the way in which educators address this issue both theoretically and practically. Further research is necessary to better
understand the way in which these factors relate to underachievement, and the usefulness of the surveys to identify the risk level for individuals of becoming underachievers.

2.4. Self-Efficacy

Self-efficacy has been established as being a powerful influence on student achievement (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Chemers, Hu, & Garcia, 2001; Greene, 2004). It is highly correlated with a range of achievement-related outcomes, across a variety of contexts, including motivation, engaging in social interactions, cessation of bad habits, coping with feared events and even success in employment (Bandura, 1986). Strong self-efficacy contributes to students completing their education and being equipped for a range of work-related opportunities (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Caprara et al., 2008; Pajares & Schunk, 2001a; Vuong, Brown-Welty, & Tracz, 2010). Self-efficacy can be defined as individuals’ judgements about their ability to engage in, perform and succeed in defined tasks and actions (Bandura, 1977). These tasks or actions may be in the context of the workplace, school performances, social connections or in virtually any realm of human endeavour. Self-efficacy has emerged from the psychological concept of expectation, which suggests that human expectations influence the initiation of behaviour, effort and persistence in completing tasks (Bandura, 1986). Self-efficacy is grounded in social cognitive theory and is reported to be developed as people acquire information to appraise their efficacy to perform tasks or engage in particular situations based on their past achievement, vicarious (observational) experiences, forms of persuasion and physiological indices (i.e., the physical feelings created by responses such as anxiety) (Bandura, 1982, 1997). Whilst high and low self-efficacy is initially related to success or
failure, the establishment of a sound sense of efficacy results in a failure having less impact on an individual and their performance (Bandura, 1986; Bandura & Locke, 2003).

Self-efficacy is related to achievement across all levels of ability (Bandura, 2001; Collins, 1982; Martin & Steinbeck, 2017), and has been found to be a significant factor contributing to the achievement of gifted students (Hook, Grenne, & Higgins, 2006; McCoach & Reis, 2000; McCoach & Siegle, 2003a; Siegle, McCoach, & Roberts, 2017; Speirs Neumeister, 2003). As self-efficacy is developed through perceptions of success and failure for gifted individuals, their self-efficacy may be related to and influenced by their natural abilities as well as their context. Research has found that gifted students have generally higher academic self-efficacy than their typical learner peers (Malpass, O'Neil, & Hocevar Jr, 1999; Pajares, 1996a; Siegle, Da Via Rubenstein, Pollard, & Romey, 2010) and that gifted underachievers have lower academic self-efficacy than gifted achievers (Obergriesser & Stoeger, 2015; Ritchotte et al., 2014). Gifted students who underachieve due to having another exceptionality (i.e., twice exceptional learners) also have lower academic self-efficacy than their regular gifted peers (Wang & Neihart, 2015). Research has also suggested that gifted students who underachieve have lower social self-efficacy than nongifted students (Gresham, Evans & Elliott, 1988). This is further supported by self-concept research, which suggests that gifted underachievers have lower self-concepts (a construct highly related to self-efficacy) than their high achieving counterparts (Baker, Bridger, & Evans, 1998; McCoach & Siegle, 2003a; Whitmore, 1980). In explaining the mechanisms of this relationship, it has been suggested that low levels of self-efficacy can create maladaptive competence beliefs in one’s capacity to realise success on challenging tasks (Snyder & Linnenbrink-Garcia, 2013), with consequent effects on motivation and
achievement. This relationship between motivation and self-efficacy has been well documented within the field of gifted education, with research demonstrating significant differences when comparing achieving and underachieving gifted students (Hook et al., 2006; McCoach & Reis, 2000; McCoach & Siegle, 2003a; Speirs Neumeister, 2003). However, there is only a small amount of research examining the relationship between self-efficacy, social coping and attitude toward school, specifically in a fully contained gifted schooling context.

2.5. Self-Regulation

Academic self-regulation is the systematic approach towards the achievement of specific academic goals, in which the learner deliberately sustains the use of cognitions and behaviours that support the attainment of these goals (Zimmerman, 1989, 1998a, 2008). Specifically, Zimmerman (1989) describes self-regulation as “the degree that individuals are metacognitively, motivationally, and behaviourally active participants in their own learning process” (p. 329). Self-regulation, according to this view, thus facilitates the transformation of an individual’s ability into performance. Theories of self-regulated learning, using the framework of self-determination theory (Ryan & Deci, 2001), have shown the impact of both cognitive and non-cognitive factors in students’ academic attainment in a variety of educational settings and success in later life (Andersson & Bergman, 2011; McClelland & Wanless, 2012; Pintrich & Schunk, 2002; Schunk & Zimmerman, 1998). A strong link has been found between students’ academic self-regulation, their use of deliberately chosen learning strategies and their academic success (Nist, Simpson, & Olejnik, 1991). Students who can self-regulate are able to choose studying and learning strategies that enhance their
achievement; they are aware of the gaps in their knowledge and understanding and the know how to address this. Not only do they know how to address gaps in their learning to improve their learning, they specifically focus on their areas of weakness through strategies such as asking teachers for assistance or understanding how to study for tests and manage long term projects. Such skills influence student performance as they increase the efficiency and effect of the effort put into learning.

There is also evidence that underachievement, particularly amongst the intellectually gifted, is related to self-regulation (Baker et al., 1998; McCoach & Siegle, 2003a; Siegle et al., 2017). For instance, research has shown that self-regulation is highly predictive of individual academic success and that enhancing self-regulatory abilities has a positive impact on students’ achievement levels (Schunk & Zimmerman, 1998). These proficiencies are highly correlated with student achievement and have been identified as a predictive factor: with research showing that academic performance in underachievers improves when self-regulation strategies are specifically addressed (Hong, Peng, & Rowell, 2009; Matthews & McBea, 2007; Ruban, McCoach, McGuire, & Reis, 2003; Ruban & Reis, 2006; Stoeger & Ziegler, 2005, 2008). Therefore, understanding the relationship between schooling context, self-regulation, self-efficacy and social coping may help researchers and educators to better address underachievement in gifted students.

### 2.6. Motivation

Motivation is a broad and complex construct that is also an established contributor to achievement. Motivation can be divided into distinctive constructs, including goal-oriented motivation, self-control, and internally-generated (intrinsic) and externally-generated
(extrinsic) forms of motivation (Gottfried & Gottfried, 2004). Despite the specific form of motivation, according to Brophy (1988), motivation to learn is “a student’s tendency to find academic activities meaningful and worthwhile and to try to derive the intended academic benefits from them” (pp. 205–206). Motivation to learn thus involves both extrinsic and intrinsic aspects of motivation. A student who is motivated to learn often derives satisfaction from school learning and therefore is more likely to engage in learning behaviours, which increase achievement (Clinkenbeard, 2012; Gottfried, Fleming, & Gottfried, 2001).

Despite the involvement of both intrinsic and extrinsic motivation in academic success, there is mounting evidence of the pre-eminence of intrinsic forms of motivation in this regard. Academic intrinsic motivation, involving a mastery orientation, curiosity, perseverance, and the desire for stimulating, difficult and new tasks (Brophy, 1988; Chae & Gentry, 2011; Gottfried et al., 2001; Green et al., 2012), have been linked to perceived capability and high achievement in learning (Harter, 1981). For instance, Gottfried, Cook, Gottfried, and Morris (2005) found that intrinsic motivation independently contributes to the variance in high school GPA.

Particularly problematic in this regard is that motivation has been found to decline with advancing age and stage in schooling. For instance, Legault, Green-Demers, and Pelletier (2006) found that secondary school students had lower levels of intrinsic academic motivation compared to primary or elementary school students. This decline in motivation is often reported to begin around middle school with changes in a student’s sense of belonging and personal relationships. Often, relationships with teachers are noted to be particularly important in these years, and this may influence attitudes to one’s teachers and motivation to learn as a consequence (Anderman, 2003; Eccles & Midgley, 1989; Midgley, Feldlaufer, &
Eccles, 1989; Murdock & Miller, 2003). This may be a result of the nature of adolescence (e.g., the need to conform, construct a distinct personal identity, as well as physical changes (Dubas, Graber, & Petersen, 1991) or the changing nature of curricula and classrooms as students move from a single teacher classroom in primary school to a multiple teacher mode of instruction, in which students may feel less connected to their teachers (Midgley et al., 1989; Murdock & Miller, 2003).

The importance of intrinsic motivation for all students, including the gifted, is derived from research that suggests that children who have higher intrinsic motivation in academic tasks are more successful in school, achieve at a higher level, have better perceptions of their capability, and have lower levels of anxiety in academic contexts (Gottfried et al., 2001; Gottfried & Gottfried, 2004; Hesek, 2004)). However, gifted students generally perceive themselves as being more capable and having higher intrinsic motivation toward academic tasks than their same-age peers (Bogie & Buckhalt, 1987; Bouchey & Harter, 2005; Feldhusen & Nimlos-Hippen, 1992; Vallerand, Gagne, Senecal, & Pelletier, 1994; Zimmerman & Martinez-Pons, 1990). However, this is less likely the case for gifted underachievers, who do not seem to maintain or exhibit this intrinsic motivation when approaching school learning. As is the case for learners more generally, it may therefore be that the level of intrinsic motivation is a vital factor influencing the achievement (or underachievement) of gifted students.

2.7. Goal Valuation

Goal valuation is another important element in student engagement as it influences the approach and response students take to achievement tasks (Hidi & Harackiewicz, 2000),
as well as moderating the self-regulation and motivation of students. When students value the purpose of an achievement task, they are more likely to be motivated to be engaged in and regulate behaviours appropriate for success in that task (Wigfield & Eccles, 2000; Wigfield, Hoa, & Klauda, 2008). Goal valuation, also called achievement or task valuation, can be defined as valuing a task due to interest, and/or placing importance on and perceiving usefulness in a task (Ritchotte et al., 2014; Wigfield, 1994; Wigfield & Eccles, 2000; Wigfield et al., 2008; Wigfield & Karpathian, 1991). This valuation is believed to comprise four key elements: attainment value, intrinsic interest, utility value, and cost belief (Wigfield & Eccles, 2002). Task or goal valuation is a combination of the four elements, with each factor influencing the individual’s achievement behaviours (self-regulation, persistence), and thereby influencing academic achievement (Pintrich & Schunk, 2002).

Research has identified goal valuation as a fundamental element of motivation (Ritchotte et al., 2014). Goal valuation, as evidenced in school based achievement tasks, is a unique mix of whether students like a task, attach importance to the task and see the task as potentially useful in the development of their skills or other aspects of their learning (Wigfield & Karpathian, 1991). Students note that when they see a subject or task as ‘useless’ they also do not enjoy their learning, suggesting the influence of goal valuation on intrinsic motivation (Smith, 2005). Delisle (2009) has even suggested that lack of engaging and challenging curriculum for gifted learners is disrespectful and reduces the desire to learn.

McCoach & Siegle’s (2003b) research regarding goal valuation and achievement in gifted students has focussed upon these students’ understanding of the importance of school achievement for their future, rather than just tapping into the value of individual tasks. This reflects research which suggests that students who have clear future directions and goals for
their careers are more likely to do well in achievement tasks (Peterson, 2000), suggesting that valuing school seems to influence the way in which students engage productively at school and the learning process (Peters, 2012a). Goal valuation has been shown to be one of the key differences between achievers and underachievers, and has been noted as a predictor variable for gifted underachievers (McCoach, 2002; McCoach & Siegle, 2001, 2003a; Rubenstein et al., 2012a). Understanding the relationship between goal valuation, the use of social coping strategies and self-efficacy on underachievement in a self-contained gifted or selective school environment may help educators to address the needs of students who may not value school based achievement as important and as such may not be achieving their potential.

2.8. Attitude toward teachers

Student attitude toward teachers is determined by the expectations that students have of teachers and the relationships that teachers form with students. Research suggests that students’ relationship with their teachers has a considerable influence on student behaviour and achievement (Curby, Rimm-Kaufman, & Ponitz, 2009; Hamre & Pianta, 2001; Hughes, Cavell, & Jackson, 1999; Meehan, Hughes, & Cavell, 2003; O’Connor & McCartney, 2007; Siegle, Rubenstein, & Mitchell, 2014; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008). Students who perceive that their teachers care about them and are actively involved in providing support for them, tend to have higher levels of achievement (Baker et al., 1998; Eccles, 2007; Jovanović Vitomir, Teovanović Pregrad, Mentus Tatjana, & Milina, 2010; Midgley et al., 1989). In contrast, many underachievers have issues with authority figures, and seem to have difficulty in connecting with teachers and other staff members in their schools (Jovanović Vitomir et al., 2010; Mandel & Marcus, 1988; McCall et al., 1992).
Research suggests that this antagonism toward these academic authority figures, including teachers, affects their ability to engage with learning at school (Mandel & Marcus, 1988).

The student-teacher relationship is seen as important for achievement (Chae & Gentry, 2011; Vialle & Quigley, 2002). Peterson and Colangelo’s (1996) research found that identified underachievers who had significantly negative attitudes to their teachers failed to achieve in all school subjects, and that they continued to underachieve for the whole of their high school careers. The attitudes of gifted students toward their teachers and courses are positively correlated to academic attainment (McCoach & Siegle, 2003a). Emerick (1992) found that the teacher was the most influential factor in reversing underachievement for gifted learners. Whilst it is known that attitude toward teachers does impact student performance, understanding the relationship between these attitudes, students’ self-efficacy and social coping skills, and student achievement in a selective or self-contained gifted context may help researchers to understand whether there are contextual influences on the attitudes that gifted learners have towards their teachers.

2.9. Attitude Toward School

Attitudes toward school are a complex factor, encompassing the value that students attribute to school for their future, whether they enjoy going to school, and/or how successful they feel at school. Much of the research into attitudes toward school has been focussed on specific subjects, with research in mathematics and science suggesting a positive correlation between attitudes toward the subject and students’ corresponding achievement level (Ali & Awan, 2013; Ercikan, McCreith, & Lapointe, 2005; Nair & Fisher, 2001; Osborne, Simon,
& Collins, 2003; Singh & Dika, 2002). This relation is far from clear, however, as Smith (2005) found that students who underachieve did not have a more negative attitude towards school than high achieving students. In fact, the underachievers noted that school was important, but that they did not enjoy the tasks presented to them at school (Smith, 2005). A smaller body of research focussed on the more global attitude to school presents similarly mixed findings about the relationship with academic achievement. Some researchers have found that the two constructs are significantly correlated (Ethington & Wolfe, 1986; Marsh & Yeung, 1998; Vialle, Heaven, & Ciarrochi, 2007) whilst other research has found that the two are weakly or not at all correlated (Abu Hilal & Atkinson, 1990).

Some research, however, suggests that gifted students who report feeling proud of their school and having a positive attitude towards school are less likely to underachieve than students who report that their school is not a place to which they feel connected (Henry, 2008; Matthews & McBee, 2007; McCoach & Siegle, 2001, 2003a). Gifted underachievers have also been reported to have more negative attitudes toward school (Jovanović Vitomir et al., 2010; Mandel & Marcus, 1988; McCall et al., 1992; McCoach & Siegle, 2003a; Rimm, 1995; Siegle et al., 2014). With the impact of negative attitudes clearly established and understanding that belonging is important to all adolescents including the gifted, it may be useful to understand the impact of the selective, self-contained gifted class on the level of achievement and whether these attitudes are related to other factors such as self-efficacy and the use of social coping strategies.

2.10. Academic Self-Perception
Self-perception is a strong driver of human learning behaviours (Eccles & Gootman, 2002; Fazey & Fazey, 2001). Self-perception is comprised of self-efficacy and self-concept. Self-efficacy, being the set of beliefs that an individual has about their capacity to execute a task, is a much more specific belief system about the self than self-concept (Bandura, 1982), which is an individual’s assessment of their global abilities (Byrne, 1996). Academic self-perception, then, is a combination of an individual’s perceptions about their ability to engage successfully in academic tasks and a more global assessment of their academic abilities. Individuals who have strong academic self-perceptions will have strong self-efficacy associated with academic tasks, and will see themselves as capable across a broader range of academic endeavours. While there is little doubt that self-perceptions influence achievement levels, this influence is likely bi-directional, with achievement levels (and their corresponding feedback) influencing self-perceptions. That is, in the development of one’s academic self-perception, individuals make internal and external comparisons to evaluate their academic abilities (Byrne, 1996; Marsh, 1986).

Research supports this reciprocal relationship between academic self-perception and achievement (Bouchey & Harter, 2005; Marsh, Trautwein, Ludtke, Koller, & Baumert, 2005; Tirri & Nokelainen, 2011; Wigfield & Eccles, 2002; Wigfield & Karpathian, 1991), although there are those who espouse that academic self-perception is not strongly related to academic performance (Valentine, Dubois, & Cooper, 2004). Despite this inconsistency, evaluation of the available research suggests not only the presence of this relationship, but that this relationship is even more pronounced when examined in relation to specific subjects, influencing interest and value (Olszewski-Kubilius & Turner, 2002).
Research into gifted students’ academic self-perception suggests that these students usually have high perceptions of self, relative to their same-age peers, which may be supported by their comparatively better academic performance (McCoach & Siegle, 2003a, 2003b, 2003c). It would be logical to assume that students who are gifted achievers would fit this profile and that underachievers would not. However, when examining the research regarding self-perception and underachievement in gifted learners, McCoach and Siegle (2003b) observed that gifted underachievers tend to have a similarly high academic self-perception to high achieving gifted learners. It is thus unclear whether and how this factor may be related to achievement in the gifted population and specifically whether context is a factor in whether gifted students who underachieve have lower academic self-perception in a self-contained gifted or selective school environment.

2.11. Social Coping and Social Coping Strategies

The research surrounding social coping emerges from the theoretical framework of psychological stress, which attempts to explain human responses to stress and strategies individuals use to cope with challenging situations (Frydenberg, 2008). Stresses can be described as an imbalance between the resources of the individual and the challenges created by the environment (Lazarus, 1991). This construct of social coping was developed to explain the differences in social patterns exhibited by individuals in social situations. Discrepancy between these requirements often necessitates the individual to adjust their behaviour to be accepted – a change that can cause stress. Adolescence is a time in which individuals feel the need to identify which of these differences are acceptable and which differences cause social isolation and rejection. In this regard, research suggests that adolescents are concerned with
three main factors: achievement, including success at school and future life successes; personal relationships, including peers and family; and social issues (de Anda et al., 2000; Frydenberg, 2008; Frydenberg & Lewis, 1991). The need to belong is a powerful drive for any adolescent and as such adolescents make decisions about behaviours in which they engage, based on their perception as to whether the behaviour will result in their inclusion in the social fabric of their world (Baumeister & Leary, 1995; Goodenow, 1993b; Goodenow & Grady, 1993; Perry, Kelder, & Komro, 1994; Roeser et al., 1996; Samdal et al., 1999). This need to belong can make the school years very difficult if an individual is seen (by themselves or others) as different. There are several differences that can connect or isolate an adolescent, including one’s physical appearance, intellectual ability and group adherence.

In relation to giftedness, gifted students have reported that high intellectual ability produces a sense of being different that can be responsible for social isolation – an issue that increases in adolescence (Cross et al., 1993; Gross, 2006; Rimm, 2002). Social coping strategies, in gifted adolescents, are the unique strategies that gifted individuals employ to deal with the social issues related to their identification as gifted, particularly within the school setting. Research suggests that gifted students may adopt social coping strategies to address this perceived stigma and better cope with the social landscape of school (Chan, 2001, 2003a, 2003b, 2004, 2005; Cross et al., 1993; Manor-Bullock et al., 1995; Swiatek, 1995, 2001). Importantly, these strategies may be related to achievement levels within the gifted population. As an example, gifted students have been found to use a number of social coping strategies to minimise their perceived stigmatisation, ranging from high visibility strategies (such as bragging about one’s successes to establish achievement as an important aspect of the individual’s identity) to camouflaging strategies that aim to minimise
identifiable difference (such as downplaying achievement or engaging in behaviours that are not conducive to academic achievement (Coleman & Cross, 2001; Coleman et al., 1993; Smith, 2005). The desire to ‘fit in’ can create internal conflict for gifted individuals as their pursuit of excellence and their desire for friendship may result in a phenomenon identified as the ‘forced choice dilemma’: choosing between friends or performance (Gross, 1989, 1999; Jung et al., 2011; Jung et al., 2012).

Often, the result of these pressures is the use by gifted students of social coping strategies that are inconsistent with high levels of academic achievement. This includes denying their giftedness, prioritising their popularity or valuing conformity, engaging in high levels of activity (co-curricular activities) and using humour (Chan, 2003a, 2004, 2005; Swiatek, 1995, 2001; Swiatek & Cross, 2007; Swiatek & Dorr, 1998). Gender also appears to influence one’s use of social coping strategies as well, with girls denying giftedness more than boys, and boys using humour more than girls (Swiatek, 1995, 2001; Swiatek & Cross, 2007; Swiatek & Dorr, 1998). These social coping strategies are linked to achievement level, in that achieving students tend to use positive social coping strategies (e.g., helping others), whereas students who underachieve tend to use negative strategies (e.g., denying giftedness, humour, and conformity). Understanding the way in which social coping may look different in a self-contained gifted/selective school environment may be useful for both educators and researchers to understand some of the unique impacts of such environments on gifted students, particularly underachievers. Also, understanding which variables relate to the utilisation of these social coping strategies and whether they might be predictor variables for underachievement may also be useful when looking at underachievement in ability-grouped contexts.
2.12. Underachievement and the Middle Years

Links have been established between engagement, behaviour and academic achievement in the middle years of schooling (Angus et al., 2010; Hattie, 2003). Angus et al. (2010) found that the use of disengaged behaviours, in the classroom, increased between year 7 and year 9, with year 9 being the peak of such issues. Whilst there seems to be no research to suggest that students grades actually drop significantly between year 7 and year 9, there is evidence of increasing disengagement with school in the middle years and as an extension, it is theorised that this is where underachievement is more likely to develop and take hold, and as such, it is likely to be more prevalent in year 9 than year 7 (Angus et al., 2010; Balfanz, Herzog, & Mac Iver, 2007; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006).

2.13. Gender and Achievement

There have been commonly held beliefs that boys perform less well at school due to engagement and disruptive behaviours. Angus et.al (2009) found that boys engage in significantly higher levels of disruptive and disengaged behaviour at school and Smith (2010) found that more boys underachieve in secondary school than girls. Underachievement seems to be associated with different causes for gifted girls and boys, with girls reportedly seeing themselves as helpless when they underachieve, whilst boys report disinterest (Schober, Riemann and Wagner, 2004). Differences have been found in one study reporting that academic self-concept as well as attitude toward school were significantly more positive for
girls than for boys. Conversely, the girls reported lower on maths self-concept and lower academic aspiration level than the boys in the same gifted program (Schober, Reimann, & Wagner, 2004). In Australia, girls continue to outperform boys on national literary measures (Angus et al., 2010), and girls have outperformed boys consistently in the HSC, the NSW matriculation examinations, and in NSW more girls are entering and completing university than boys (NSW Ministry of Health, 2016). With this in mind, underachievement in school may be linked to gender regardless of whether a child is gifted.

2.14. Theoretical Framework

The theoretical framework that frames this study is social cognitive theory (SCT), which is commonly used as a foundation for research into self-regulation, self-efficacy and motivation, and can also be applied to the constructs of social coping and giftedness.

2.15. The Theoretical Framework Adopted for this Study: The Social Cognitive Framework

SCT is one of a large body of theoretical frameworks through which learning and development can be examined. At the core of this theory, as developed by Bandura (1986) and expanded by others (Deci & Ryan, 1985.; Dweck & Leggett, 1988; Weiner, 1980, 1992), is the concept that cognition is key to behaviour and that learning occurs within a social context. SCT, as a psychological model of behaviour, emphasises the development of behaviours that connect individuals socially and suggests that an individual’s learning is shaped by this connection. SCT espouses that all learning occurs within, and is a product of, an individual’s interactions within a social context. This theory has been applied in
psychological, health, and career research, and been used extensively to explore and explain motivation, learning and achievement within the context of the classroom (Pajares, 1996; Schunk & Zimmerman, 1994; 1998).

There are three key components that make up SCT to explain the development of behaviour and the process of learning. Firstly, the concept of triadic reciprocity suggests that personal, behavioural, and environmental factors have reciprocal effects on the development of individuals’ behaviour and learning, with an individual’s development being the product of the interaction between these factors (Bandura, 1989). When developing responses to their environment, individuals use observation, interaction and reflection to better understand and work effectively within their context. In the school context, SCT suggests that achievement is the result of learning that has been shaped by the school or classroom environment, including feedback from self and others, individual self-perceptions and the interpretation of the classroom context. Secondly, SCT asserts that individuals shape their behaviour in a deliberate and goal-directed manner (Bandura, 2001). SCT asserts that the external environment is indeed important, but that individuals can have considerable influence over their own development and their environment through self-regulatory, reflective approaches. Thirdly, according to this theory, learning involves not just the acquisition of new behaviours, but also an understanding of the concepts behind those behaviours (this may include knowledge, skills, abstract rules, approaches and values). This means that students may not display their learning until they are sufficiently motivated or feel a need to do so. SCT thus posits that whilst context influences learning, individuals are active agents in the way that they interact with their environment.
SCT is thus a useful lens through which to examine underachievement, as it suggests that the interaction between personal, environmental and behavioural factors shapes learning and the expression of that learning. For underachievers, this may mean that the low levels of personal factors such as motivation, self-regulation, self-efficacy and self-perception may interact to produce negative effects on academic performance. For instance, an underachiever may choose not to attend to new learning due to its perceived lack of value (if their focus is on hiding their giftedness or attaining popularity) or their belief that they cannot attain the outcome (due to low levels of self-efficacy). The essence of underachievement, according to this theory, is thus a complex interaction of individuals’ perceptions of themselves and the world around them. Researchers adopting this framework explore these factors and the way in which they interact, in order to find patterns that explain achievement or underachievement (Glynn, Taasoobshirazi, & Brickman, 2007).

### 2.16. Giftedness and Talent Through a Social Cognitive Lens

Using the operational definition of giftedness and talent posited by Gagné (2004) and the overarching view of the social cognitive framework to explain the developmental process as a gifted individual learns and grows, enables researchers to conceptualise the complex nature of talent development. Examining the points of intersection between the DMGT model of giftedness and talent and the social cognitive framework enables researchers and educators to understand the development of giftedness into talent and the variables that may inhibit the development of talent and contribute to underachievement. Within the DMGT, giftedness is viewed as the expression and development of innate ability (giftedness) into exceptional
levels of performance (talent), shaped by an individual’s personal and environmental factors. These factors within the DMGT are related to the personal, behavioural and environmental factors in SCT, and explain human behaviour, in this case engaging in learning, training, and practise to develop talent in gifted individuals. The process by which gifts are developed into talents, according to Gagné, is influenced by both intrapersonal and environmental catalysts (which include personal factors such as motivation, goal valuation, self-regulatory behaviours, and environmental factors including persons, experiences and milieu) intersecting with SCT’s assertion that human behaviour is driven by a complex interaction of an individual’s personal, behavioural and environmental factors. As such, a gifted individual’s learning behaviour, reflected in their engagement in learning, is shaped by the three personal cognitive factors in SCT (knowledge, expectation and attitudes of an individual) that intersect with Gagné’s model through the interpersonal catalysts, specifically goal management. The SCT environmental factors (social norms, volition and community) intersect with the environmental catalysts described by Gagné, and shape the way in which a gifted individual responds to the world and engages in learning and development of talent. Finally, the SCT behavioural factors of self-efficacy, effort and skill reflect the goal management catalysts in Gagné’s model, with these catalysts/factors influencing the individual’s investment in the development of their talents, and therefore their level of achievement, within a field of endeavour. From a social cognitive lens, the interaction of these catalysts is shaped by the individual’s cognitive processes for perceiving themselves and their place in the world. As such, achievement and underachievement in gifted individuals are shaped by their world, their personal traits and the way in which they perceive their place in their context. Gagné’s DMGT model intersects with key elements of the social
cognitive framework (see Figure 2.2), explaining the role of personal, behavioural and environmental factors in the developmental process through the human behaviour of learning engagement, resulting in differing achievement levels for gifted learners, depending on the interaction of these factors on the individual’s effort.

Figure 2.2. Intersection of Social Cognitive Theory and Gagné’s DMGT for Research into Gifted Underachievement

2.17. Underachievement and the Social Cognitive Lens
The framing of giftedness and talent in the social cognitive framework, and defining it using the Gagné model, has important implications for the way we understand and explain underachievement.

The underpinning assumptions of SCT contextualise the intrapersonal and environmental catalysts which have been found to impact on achievement (including self-efficacy, motivation/self-regulation, attitudes, social coping strategies and ability grouping). The SCT and the DMGT enable educators and researchers to examine when these catalysts are inhibiting rather than encouraging the development of gifts into talent. Triadic reciprocity, where personal, behavioural, and environmental factors have reciprocal effects on the development of an individual’s behaviour and learning, supports the conceptualisation of the variables attributed to causing underachievement. The interaction of personal factors such as motivation, behavioural factors such as self-regulation, and contextual factors such as attitude toward school, correlate with a student’s achievement level (McCoach & Reis, 2000; McCoach & Siegle, 2001, 2003a). The interactions between or effect of these factors develop students’ perceptions about themselves as learners and perceptions about their capacity to engage in learning, thereby influencing learning outcomes. As SCT asserts that individuals shape their own behaviour in a deliberate and goal-directed manner (Bandura, 2001), understanding the reasons that students make the decisions they make about engagement with school gives an insight into the drivers of achievement-promoting or -inhibiting behaviours for gifted learners.

2.17.1. Self-efficacy, Underachievement and Social Cognitive Theory
Self-efficacy in the development of talent in gifted individuals, when seen through social cognitive theory, is a behavioural factor which drives the way in which a human engages in learning based on their beliefs about their capacity. Underachievement then is in part a response to low self-efficacy, which leads to gifted students not engaging fully with learning. Self-efficacy is at the core of SCT, as self-efficacy is developed through a combination of external experiences and self-perceptions and is the embodiment of the individual’s external social factors. Underachievement for an individual means that the cognitive process in SCT has shaped the individual’s view of high academic achievement as either impossible or although perhaps desirable, it does not feel ‘worth’ the hurdles that must be overcome to achieve it, particularly if the work is perceived boring or irrelevant. For those who doubt their capacity to achieve at a high level, their self-efficacy has been diminished leading often to cognitive inefficiencies or lack of application. Those who assess high academic achievement as socially undesirable have decided to focus on social acceptance rather than achievement, the latter of which they perceive as isolating and potentially harmful to their connection with others in their peer group. Self-efficacy is also one of the core catalysts in the goal management section of the DMGT, shaping the way gifted students engage in the developmental process.

2.17.2. Academic Self-Perception, Underachievement and Social Cognitive Theory

Research has shown that students’ perception of their capacity to perform a task significantly influences their ultimate success (Bandura et al., 1996; Chemers, Hu, & Garcia, 2001; Greene, 2004; Multon et al., 1991; Pintrich & De Groot, 1990; Schunk &
Hanson, 1985; Valentine, DuBois, & Cooper, 2004; Zimmerman & Bandura, 1994). Understanding the relationship of self-efficacy to underachievement, specifically in an academically selective environment, may be an important addition to the theoretical basis of understanding gifted underachievement.

Similarly, an individual’s academic self-perception (the perception an individual has of themselves academically is a construct that is with a combination of self-concept and self-efficacy) is developed through feedback from the environment, past experiences and communications from others about their performance, resulting in the assessment of their capacity in the academic sphere in relation to this feedback. This perception, according to SCT and the DMGT, in turn shapes an individual’s behaviours in relation to their level of academic engagement. Research suggests that academic self-perception is the combination of an individual’s response to academic experiences, mastery of academic tasks, and feedback from teachers and peers. This again shows the usefulness of the Gagné model and social cognitive theory in explaining the impact of academic self-perception on underachievement in gifted students (Bong & Skaalvik, 2003; Byrne, 1996; Wigfield & Karpathian, 1991). With differences in the research findings regarding gifted underachievers’ academic self-perception, it may be useful to understand how this variable relates to underachievement within a self-contained gifted context, giving a better understanding of Gagné’s environmental catalysts and Bandura’s environmental factors.

Research regarding the link between academic achievement and academic self-perception in gifted students has provided different outcomes, with some research suggesting that academic self-perception is not related to the level of achievement in gifted students (Dai, Rinn, & Tan, 2013; McCoach, 2002; McCoach & Reis, 2000; McCoach & Siegle,
2003a), and other researchers reaching the opposite conclusion (Bouchey & Harter, 2005; Marsh et al., 2008; Marsh et al., 2005). The differences between the findings suggests that examining the contextual and environmental differences for these students may provide some explanation for this disjuncture. One explanation may be Delisle and Galbraith’s (2002) conception of the difference between the underachiever (who is psychologically and academically at risk due to low self-concept and self-efficacy) vs. the selective consumer (who is disengaged from school due to lack of interest rather than belief (Figg, Rogers, McCormick, & Low, 2012). The differences between these two types of gifted underperformer may be found in both the DMGT and SCT, in that the context for these individuals may have shaped their academic self-perception: with selective consumers choosing not to engage in academic achievement tasks which are ‘boring’ or tasks and subjects that are perceived as irrelevant, whilst having enough other positive experiences to robustly maintain their confidence in their academic capacity. Underachievers conversely may not believe that they are gifted and may have had experiences that have eroded their beliefs about their capacity. Additionally, questions have arisen regarding the impact of context on academic self-perceptions, such as grouping strategies utilised in schools, with some researchers suggesting that the ‘big-fish-little-pond syndrome’ (Craven, Marsh, & Print, 2000; Green et al., 2012; Marsh et al., 2008; Marsh, Trautwein, Ludtke, Baumert, & Koller, 2007; Marsh et al., 2005; Rollins & Cross, 2014) may be a result of gifted students comparing themselves within an ability-grouped or selective schooling environment. Other research suggests that the impact of grouping gifted students together may be important for developing positive academic self-perception in that the environment provides opportunities for students to develop resilience, realistic judgements of their performance compared to
others of similar ability, as well as positive social and emotional outcomes of being with others who think like them (Gross, 1997; Preckel & Brüll, 2010; Rogers, 2007). Our ability to compare the true impact of grouping the development of gifted students’ self-perception is confounded by the limited information provided on the way grouping is applied in research studies (i.e., based on ability testing, subject performance, or holistic school performance) and whether the individuals are ‘set’ into the track or have flexibility in where they are placed. As such, it is difficult to assess whether grouping, tracking, setting, streaming or any of these grouping methods has an impact on academic self-perception, academic self-efficacy or any other driver of student learning behaviour.
2.17.3. Motivation/Self-Regulation, Underachievement and Social Cognitive Theory

The influence of motivation and self-regulation on gifted and talented students and their performance can also be examined within SCT, as it posits that motivation, like self-efficacy, is shaped by reciprocal determinism (Bandura, 1986, 1997). The sources that create experiences conducive to the development and maintenance of motivation are influenced by the environment and the learners’ experience within that environment. If students can maintain their motivation and self-regulation, research shows that they are more likely to achieve. The SCT framework (Bandura, 1997) and Gagné’s DMGT describe the impact of environment on motivation and the development of self-regulation strategies that enable students to maintain their motivation, develop intrinsic rather than extrinsic motivation, and provide opportunities for the development of strategies to regulate learning. It is the combination of the social and the cognitive impacts that influences motivation and self-regulation. The development of motivation is a complex process, but involves feedback from peers and other important individuals, as well as students’ interpretation of the effect of their effort on achievement both as an individual and in comparison with others. Furthermore, the challenge and perceived effect of effort is influenced by the perception of the quality and challenge of the learning experiences, described by Csikszentmihalyi (1986, 1993) as ‘optimal learning experiences’ and ‘peak moments’. These experiences increase motivation and self-regulation, building the desire to practise and put effort into learning in the hope of achieving these peak moments again (Csikszentmihalyi, 1993; Csikszentmihalyi & Robinson, 1986; Dweck, 1999; Dweck & Leggett, 1988). The development of motivation in these types of experiences bolsters self-efficacy and self-perception through mastery of
difficult tasks, and as such, explains the relationship between self-efficacy, motivation, self-regulation and achievement. Additionally, these experiences influence students’ attitude toward teachers and school.

Research grounded in the social-cognitive motivational framework (Bandura, 1997), explores the impact of intrinsic and extrinsic motivation, specifically goal orientation, self-determination, self-efficacy, and anxiety (Glynn et al., 2007), all factors that relate to and influence motivation and self-regulation. These factors are all highly correlated with student achievement in general as well as achievement in gifted students (Dweck & Leggett, 1988; McCoach & Siegle, 2003a).

2.17.4. Attitudes, Underachievement and Social Cognitive Theory

The development of attitudes is explained within SCT through the individual’s engagement with and reflection on their experiences within their social context. According to SCT, humans use observational learning to develop attitudes, values and beliefs (Bandura, 2003). Individuals with positive experiences with others and within different settings are likely to develop more positive attitudes. Where the impact of attitudes on performance are seen in the DMGT is through the influence they have on an individual’s engagement in the developmental process; how much, time, energy and effort they expend to develop their abilities into talent; and how this impacts on the types of activities in which they engage. These factors are linked to the perceptions they have of the importance of school, and of the quality of their schooling and teachers, all of which are environmental catalysts. As such, goal valuation is both developed within the school context and shapes the way in which
individuals engage in school learning. The development of goal valuation when related to school directly connects to a student’s interpretation of its relevance to their accomplishments, in both the short and long term. SCT would assert that goal valuation is a response to the personal, environmental and behavioural experiences that influence an individual’s cognitive assessment of the value of school. Within the DMGT, the impact of goal valuation on a student’s engagement in the developmental process is explained within the intrapersonal catalyst goal management section of the model. This assessment may be influenced positively by motivating experiences that promote the goals of the individual. Conversely, negative experiences and irrelevance may influence a student’s perception about the usefulness of school, and as such may have an impact on the way in which they engage in the learning/developmental process. The DMGT and SCT would assert that is it more likely that gifted individuals will value school, and are, as such, more likely to have positive personal and behavioural experiences within school that match their beliefs about its importance. This valuing of school is influenced by the attitudes that gifted individuals have toward their school and their teachers, with students who perceive that their school is a good match for them and that their teachers provide appropriate learning experiences for them being more likely to achieve. Therefore, goal valuation, attitude toward school and attitude toward teachers are fundamentally related to students’ experience at school, their sense of connection to their school context and ultimately to their level of achievement.

SCT and the DMGT both suggest that individuals’, including gifted individuals’, beliefs, responses and actions are shaped by experience, environment, and feedback. Even the social strategies that individuals employ within their world are shaped by experiences and the assessment of those experiences, shaping future responses. Social coping, according to
Coleman (Coleman, 1985, 1987) is needed when a child’s actions are dissimilar to the common or expected beliefs and behaviours of a particular group. Group members will sanction the member’s actions only if the individual complies with the beliefs and behaviours of the group, providing the feedback that SCT suggests is important for individuals to make meaning from their experiences. Coleman argues that the severity of the outcomes for those who break with the expected norms will be proportionate in degree to the perceived effect of the breaking of those norms. As such, individuals will modify their behaviours to avoid isolation (Coleman, 1987; Coleman & Cross, 1988; Jussim, Coleman, & Lerch, 1987). For gifted individuals, this may mean that they become socially isolated if they perform well academically, and that they may choose to underachieve to minimise the visibility of their difference (Gross, 1989; Jung et al., 2011).

SCT helps to explain the human responses and feelings of belonging, as it describes the impact of psychological needs on human behaviour and motivation in social situations. The satisfaction of these needs affects people’s perceptions and behaviour, and it is the social context that influences how well these needs are met. As such, SCT helps explain the behaviours or social coping strategies adopted by gifted individuals in relation to their achievement level. SCT suggests that context shapes motivations for social behaviours, as they are a result of the perceptions of others and are influenced by group dynamics. A student’s beliefs about achievement and the impact of achievement level within their social network influences the way they will engage in social coping strategies in order to better fit, linking achievement with social coping (Bandura, 1986, 1997). This further extends our understanding of social coping strategies and their adoption by individuals, which according to the SCT is a result of vicarious observation, interaction with others and reflection about
their effectiveness of these behaviours on their acceptance. For gifted individuals, who report that they often “feel” that they do not “fit”, this processing may mean that they determine to adopt particular social coping strategies to remediate this concern. This may mean that if academic achievement is not valued by their peers, family or other important groups, negative social coping strategies may be employed in order to feel more effective their social interactions. As such, underachievement may be able to be identified by the social coping strategies employed by underachieving gifted students.

2.17.5. Developing a Model of Underachievement

The DMGT provides a framework in which to understand the impact of social decisions in response to the environment in which a gifted child is situated, showing that peers and other socially influential individuals play a significant role in the way in which gifted individuals engage in the talent development process. Much research has focussed on the way in which gifted individuals perceive themselves in comparison to more typical learners and the impact of this on levels of achievement. Social coping strategies are a set of behaviours individuals use to remedy their sense of connection, and for gifted individuals this may mean trying to look more like their more typical aged peers. The research into social coping strategies in relation to gifted individuals and underachievers suggests that underachievers tend to use more negative social coping strategies, such as denying giftedness, to minimise the visible differences between them and their average ability peers. Alternatively, gifted achievers employ more positive social coping strategies such as helping others to create social connections. Whatever the type of social coping strategy employed,
these are part of the individual’s response to the environment and are utilised to better connect with others.

A developmental model of gifted underachievement based on the integration of the DMGT and SCT is shown in Figure 2.3. This model proposes that achievement level is influenced by social cognitive theory through a gifted individual’s response to the personal, environmental and feedback variables in their context. Furthermore, the model engages the DMGT to illustrate that the triggers that relate to underachievement which emerge from the individual’s environmental and intrapersonal catalysts, and that their response to these catalysts influences the way they engage or disengage from the developmental process. The variables considered in this model include elements of a gifted student’s attitude toward school, self-efficacy, their gender, grade level and their schooling context of being ability-grouped with other gifted peers in either a fully selective or partly selective school. Furthermore, the model suggests that social coping strategies are a response to the context, which may also impact academic performance. While this model shows the proposed relationships examined in this study, only those with solid arrows show relationships that have current empirical support (dashed arrows indicate relationships that can be inferred from the research literature, but lack substantial research evidence). Dotted arrows indicate factors not found to be related to underachievement in the literature, but which have a theoretical base for inclusion. Importantly, no study has yet used this theoretical and empirical intersection to explore the independent and interactive contributions of this combination of factors among gifted students.
Figure 2.3. Theoretical Framework for this study. Factors related to achievement level in gifted students in ability grouped environments.

2.18. Conclusion

Webb, Meckstroth and Tolan (1989) questioned: “Why is it that so many gifted children suffer so wide a breach between potential and performance? What is it that causes so many gifted children to lose their spark? What can be done to rekindle it? How can their energy be channelled after it is rekindled?” (p. 63). These questions are the driving questions behind the research into underachievement in the gifted population. Trying to understand the
reasons that gifted students’ performance does not follow the expected trajectory is the age-old question for educators of the gifted. This question informed the review of the literature in this study and underpinned the central hypotheses. The literature review has uncovered a number of factors which have been associated with underachievement in gifted students including attitude toward school (McCoach & Reis, 2000; McCoach & Siegle, 2003a, 2012), the various facets of self-efficacy (Bandura et al., 2001; Brown, Lent, & Larkin, 1989; Felsman & Blustein, 1988; Vancouver, Thompson, & Putka, 2002; Wang & Neihart, 2015) and the way in which social coping strategies are used by gifted underachievers to mitigate their status as different due to their high ability (Chan, 2005; Swiatek, 1995, 2001). Further to these variables, understanding the role of school context in underachievement may be useful to understand whether being ability-grouped creates different patterns of underachievement; that is, does being in a gifted class or selective school impact on the way underachievement is expressed and the way that gifted students perceive themselves? The nature of underachievement is comparative in that we cannot examine underachievement without examining achievement; therefore, understanding the way in which different variables diverge between achievers and underachievers is useful when examining underachievement in gifted students, and in particular, gifted students in a selective or gifted class context. Through an understanding of the variables that impact upon gifted students who underachieve and the differences between these students and achievers, researchers may be able to identify improved responses and approaches to identifying students who are at higher risk of underachieving than others. By understanding the way in which the social, attitudinal, and contextual factors contribute to underachievement, educators may be able to look for observable behaviours that indicate that an individual is at risk of underachieving.
Chapter 3. Methodology

3.1. Introduction

The purpose of this chapter is to provide the rationale and details of the methods used for this study. The chapter provides a description of the study’s methods, including the participant sample, data collection instruments and procedures. The first section discusses the problem and purpose of the research study, which is based on the research and literature discussed in the previous chapter. It also discusses the stated hypotheses that have guided the methods and analytical processes used. The second section describes the research design selected as appropriate to the study aims and theoretical underpinnings, including justification of design. The third section presents the context of the study describing the sites and participants used in the study. The fourth section discusses the data collection instruments. The processes of data collection and analysis are covered in the fifth and sixth sections respectively.

3.2. The Problem

The question of underachievement in gifted individuals has been a significant focus of research in the field of gifted education. The complexity of the factors that influence whether an individual is likely to underachieve has made it difficult to determine why it is that some gifted students do not fulfil their ‘potential’. Being able to better understand the factors that effect underachievement in different contexts and more effectively identify individuals who are likely to underachieve may make it more likely that the
underachievement can be addressed and that more gifted students may reach their identified potential.

3.3. Purpose of the Study

The purpose of the present study was to address the problem of underachievement through examining attitudes of underachieving gifted students in comparison with achieving gifted students in relation to their attitude toward school, their self-efficacy and their social coping strategies. The aims of the study were multidimensional. First, the utility of the questionnaire instruments for use with identified gifted students in an Australian self-contained or ability group context was evaluated. This involved psychometric evaluation of the Social Coping Questionnaire (SCQ), School Attitude Assessment Survey – Revised (SAAS-R) and the Self-Efficacy Questionnaire for Children (SEQC). Second, the study investigated the extent to which demographic factors (i.e., school type, sex, school year) related to students’ current classification as an achiever or underachiever. Third, the study assessed the patterns of correlations between factors that have been associated with underachievement (i.e., social coping strategies, self-efficacy and attitude toward school). Fourth, the study investigated whether gifted achievers and underachievers differed on each of these factors. Lastly, the study aimed to explore the extent to which (under)achievement could be predicted from each of these factors.
3.4. Research Questions and Hypotheses

1. **Do the adopted questionnaire instruments display appropriate psychometric properties in the Australian gifted (i.e., self-contained and ability-grouped) context?** In line with research suggesting good psychometric properties of the SAAS-R, the SCQ and the SEQC, it was hypothesised that these instruments would be appropriate for use within an Australian gifted context.

2. **To what extent does school type, sex and school year relate to students’ status as achieving or underachieving?** In line with research suggesting that gender, school context and year group influence achievement levels, it was hypothesised that gifted males would be more disposed to underachievement than gifted females, that students attending fully selective schools would be less likely to underachieve and that students in year 8 and 9 would be more likely to underachieve than students in year 7, reflecting the increasing disengagement in the middle years of school.

3. **Do patterns of correlations between factors associated with underachievement differ between gifted achievers and underachievers?** In line with research suggesting that underachievers differ from achievers on a number of intrapersonal and environmental factors, it was hypothesised that there would be different patterns of correlations between the investigated factors (i.e., academic perception; attitude toward school; attitude toward teachers; goal valuation; motivation/self-regulation; academic self-efficacy; social self-efficacy; emotional self-efficacy; the social coping strategies of humour, denying giftedness, helping others, activity level, focus on
popularity, and conformity) for gifted achievers and underachievers, with factors for gifted achievers being expected to show positive correlations for the factors related to attitude toward school, self-efficacy, and positive social coping factors such as activity level and helping others. It is hypothesised that the patterns of correlations between factors for gifted underachievers would indicate that underachievers would be more likely to have more negative attitude toward school, more negative self-efficacy and use negative social coping strategies such as humour, denying giftedness, focus on popularity, and conformity.

4. **Do achieving and underachieving gifted adolescents differ in social coping, school attitudes and self-efficacy?** In line with research suggesting underachievers differ from achievers on these factors, it was hypothesised that gifted achievers would differ from gifted underachievers in that the latter would have more negative attitude toward school, lower self-efficacy and use negative social coping strategies, when compared to gifted achievers.

5. **To what extent do demographic factors, social coping, school attitudes and self-efficacy predict students’ (under)achievement?** In line with research suggesting that underachievers differ from achievers, it was hypothesised that factors in the survey instruments and demographic factors would be able to predict achievement or underachievement in gifted students. It was hypothesised that group membership (either the achiever or underachiever group) would be predicted by goal valuation

3.5. Research Design

A quantitative approach was used to explore how several factors that have been associated with the (under)achievement of gifted students relate to students’ current achievement status in the Australian gifted context. Quantitative research questions are specific and require the collection of measurable data on chosen predetermined instruments for statistical analysis, and comparisons with prior predictions and past research (Creswell, 2005). The current study adopted a causal-comparative design, in which naturally occurring groups of gifted achievers and underachievers were recruited. This design was most appropriate as the study intended to identify the factors which cause underachievement through a comparison of group members who were identified as gifted achievers or gifted underachievers. Specifically, a causal-comparative approach investigates differences in the dependent variable(s) between two naturally occurring groups, in this case underachieving gifted learners and achieving gifted learners. Quantifiable survey data were sought to summarise the attitudes of a large number of gifted adolescents, thus permitting potential generalisations to be made. The collection of data occurred at one point in time to provide a 'snap-shot' of the variables at one time and is therefore classified as cross-sectional (Creswell, 2005), allowing for comparisons and predictions to be made about the groups within the sample.
This study adopted purposive sampling (Fraenkel & Wallen, 2006), as this approach helped the researcher investigate questions relating to selected groups (i.e., gifted achievers, gifted underachievers) by selecting gifted students identified as either achieving or underachieving (Devers & Frankel, 2000). In this research, achievers and underachievers needed to be comparable in terms of the way they were identified and the context in which they were learning. The sample was selected from public, Catholic and independent schools in New South Wales, all of which used selective or self-contained grouping approaches to meet the learning needs of gifted students. Students enter the programs in this study based on results gathered from a battery of tests including general ability measures and measures of achievement in reading, mathematics and writing. The proportion of the participants who attend selective or partly selective high schools in the NSW Department of Education are selected on the basis of the number of places available with 14,458 students sitting the test in 2017, applying for 4,226 places in the program with entry into grade 5 and grade 7 (Smith, 2017). Students entering grade 7 in NSW total approximately 50,000 each year and as such 4,226 students equates to the top 8.5% of students being offered places in these schools. The participants from cohorts in the Catholic and Independent schools in the sample were required to sit tests which include general ability measures and achievement measures in reading, writing and mathematics. The programs from these sectors in this study offered places to students in the top 10%. The purposive sampling approach further required that schools used the comparable instruments for identification of giftedness, with selective high schools using the Selective High School Placement Test which includes reading, mathematics and general ability measures. The other schools are unable to access the selective high schools tests and were chosen as they used the Otis Lennon Scholastic Aptitude
Tests (OLSAT) for assessing general ability and reading and mathematics tests, to identify their students. This approach reduced the heterogeneity of the sample, as all participants were identified using comparable general ability and performance measures in the same subject areas. This reduced variability associated with identification based on individual teacher opinions regarding who is gifted.

More specifically, to be included in the study, participants needed to attend a school that:

- used the Gagné model of Giftedness and Talent. This was to ensure consistency in the definition of the participants as identified gifted and talented students;
- identified their gifted students using selective high school tests and OLSAT ability assessments in mathematics, reading and writing. This ensured that participants were similar in the way they were identified as gifted; and
- had self-contained gifted classes, selective classes or a context in which gifted students were grouped together full time for their academic learning.

As such, the population of interest for this study required that the sample was purposefully chosen to include both underachieving and achieving gifted students in self-contained contexts. However, to increase the generalisability of the study, schools were included from the three educational sectors in NSW: government selective high schools, independent and Catholic high schools. Whilst the weaknesses of purposive sampling mean that there are threats to the external validity of the study, due to reduced ability to generalise the research, purposive sampling allowed the researcher to address the questions in the research, reduced the variability of identification of the students as gifted, was more feasible
for data collection, was efficient and allowed for some generalisation to the gifted population as a whole.

In Australia, there are few middle schools and most students in grades 7, 8 & 9 attend high schools. These schools include students from grades 7 through 12. The majority of students in this sample attended 7 through 12 high schools, with only one school having an identified middle school, in which students were the middle school in grades 7 - 9.

3.6. Sites

The schools involved in the study were in NSW with many in a large urban city context. There were eight schools involved in the research, with one school used to pilot the instruments. Of the eight schools, four were co-educational public high schools that were either fully or partially selective and the remaining four included a coeducational public high school with a gifted stream, a coeducational Catholic school with a gifted stream, one Catholic girls school with a full time gifted class and one independent coeducational school with a gifted stream. The pilot school was a coeducational school with a full time gifted class.

School 1 was a Catholic girls’ high school located in a large metropolitan city in Australia, with 62% of students coming from English as an Additional Language or Dialect (EAL/D) backgrounds and 1% of students identifying as Indigenous. The school had an identified gifted class for girls in years 8, 9 and 10. Girls were identified for placement in the class using standardised ability and performance assessment.

School 2 was an independent coeducational K-12 school in a beachside area in a large metropolitan city in Australia, with 8% of the students coming from EAL/D backgrounds, and no students identifying as Indigenous. The school is a high fee-paying school. The school
had a gifted class for students in years 7, 8 and 9 and students were identified for placement in the class using standardised ability and performance assessments.

School 3 was a coeducational public high school with a selective stream in years 7, 8, 9 and 10. Students were identified for placement in the selective stream based on the Selective High Schools Test, an ability and performance assessment. The school, located in an outer suburb of a large metropolitan city in Australia with 24% of students coming from EAL/D backgrounds and 5% identifying as Indigenous.

School 4 was a coeducational public high school with a gifted class in years 7 and 8. Students were identified as gifted using standardised ability and performance assessments. The school is located in a suburb in a large metropolitan city in Australia, with 49% of the students coming from EAL/D backgrounds and 2% of students identifying as Indigenous.

School 5 was a coeducational partially selective high school located in a suburb of a large metropolitan city in Australia, with 82% of the school population coming from an EAL/D background and 2% of the students identifying as Indigenous. Students from years 7, 8 and 9 were identified as gifted based on the Selective High Schools Test of ability and performance. Students may come from the local area, but many selective students travel from outside the local area to attend the school.

School 6 was a coeducational fully selective high school located in a suburb of a large metropolitan city in Australia, with 93% of the school population coming from an EAL/D background and no Indigenous students in the cohort. Students in years 7, 8 and 9 were identified as gifted based on the Selective High Schools Test of ability and performance. Students may come from the local area but many travel from outside the suburb to attend the school.
School 7 was a coeducational Catholic K-12 school located in a coastal area located between two large metropolitan cities in Australia, with a gifted class for identified gifted students in years 7 and 8. 5% of the school’s cohort are Indigenous students and 8% of students come from EAL/ D backgrounds. Students eligible for entry into the class were identified using a standardised ability and performance assessment. Students are drawn mainly from the local area.

School 8 was a partially selective coeducational public high school located in a suburban area of a large metropolitan city in Australia, with 78% of the school population coming from an EAL/D background and 2% of students identifying as Indigenous. Students in years 7, 8 and 9 were identified as gifted using the Selective High Schools Test of ability and performance. Students are drawn from a wide range of areas and may travel long distances to get to the school for the selective stream.

School 9 (pilot school) was a coeducational independent school in a large metropolitan city in Australia, with 53% of the students coming from EAL/ D backgrounds and no students identifying as Indigenous. The school had a gifted class for students in years 7, 8, 9 and 10 and students were identified for placement in the class using standardised ability and performance assessments.

The socio-economic demographics of the participant schools reflect a variety of patterns of socio-economic advantage, when compared with the Australian distribution, as reported through the ICSEA data, available on the Australian Curriculum, Assessment and Reporting Authority’s My Schools website (ACARA, 2017), see Table 3.1.
Table 3.1 Socio-Economic Demographic at the time of data collection ICSEA Data

<table>
<thead>
<tr>
<th>School Distribution</th>
<th>Bottom Quarter</th>
<th>Middle Quarters</th>
<th>Top Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>School 1</td>
<td>26%</td>
<td>21%</td>
<td>37%</td>
</tr>
<tr>
<td>School 2</td>
<td>3%</td>
<td>4%</td>
<td>43%</td>
</tr>
<tr>
<td>School 3</td>
<td>37%</td>
<td>23%</td>
<td>29%</td>
</tr>
<tr>
<td>School 4</td>
<td>25%</td>
<td>18%</td>
<td>37%</td>
</tr>
<tr>
<td>School 5</td>
<td>39%</td>
<td>23%</td>
<td>27%</td>
</tr>
<tr>
<td>School 6</td>
<td>4%</td>
<td>6%</td>
<td>38%</td>
</tr>
<tr>
<td>School 7</td>
<td>29%</td>
<td>25%</td>
<td>35%</td>
</tr>
<tr>
<td>School 8</td>
<td>22%</td>
<td>14%</td>
<td>44%</td>
</tr>
<tr>
<td>School 9 (pilot)</td>
<td>3%</td>
<td>4%</td>
<td>25%</td>
</tr>
<tr>
<td>Australian</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
</tbody>
</table>

3.7. Participants

The initial sample for this study consisted of 601 middle school or lower high school students, drawn from the aforementioned eight sites in NSW. All participants attended schools which had self-contained classes for gifted learners and participants had been placed in these classes (i.e., identified as gifted). The composition of the sample derived from each school ranged from 2.8% to 26.5% of the total sample. Table 3.1 displays the frequencies and percentages of the total sample that came from each of the eight schools. Further, as there were only six Year 10 students, these data were not included for the purposes of analysis. The resultant sample for analyses consisted of 596 students drawn from Year 7 to Year 9.
Table 3.2. Demographic Makeup of Participating Schools

<table>
<thead>
<tr>
<th>School #</th>
<th>% of sample</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Total</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>School 1</td>
<td>7.3%</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>School 2</td>
<td>9.5%</td>
<td>13</td>
<td>18</td>
<td>6</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>School 3</td>
<td>2.8%</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>School 4</td>
<td>6.8%</td>
<td>8</td>
<td>9</td>
<td>13</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>School 5</td>
<td>11.6%</td>
<td>12</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>School 6</td>
<td>27.1%</td>
<td>23</td>
<td>25</td>
<td>37</td>
<td>38</td>
<td>20</td>
</tr>
<tr>
<td>School 7</td>
<td>7.8%</td>
<td>3</td>
<td>13</td>
<td>5</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>School 8</td>
<td>26.5%</td>
<td>21</td>
<td>17</td>
<td>33</td>
<td>36</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Figures in the table represent proportions and/or frequencies of each demographic characteristic.

The gender of the participants in the sample was reasonably equal with more females (54.4%; N = 324) responding to the survey than males (45.6%; N = 272). Participants attended two distinct categories of schools: fully selective or partly selective; that is, a school containing a gifted stream or class. Of the full sample, 27% attended a fully selective high school and 73% attended partly selective schooling contexts.

Participants’ identification as an achieving student or underachieving student was via students’ grades, specifically their results in the key subject areas of English, Mathematics, Science, History and Geography (all of which are mandatory in NSW high schools). Participants were identified as underachieving if they achieved a C grading, at the end of the school year, in at least three of the five main subjects, with each subject being measured individually (rather than being aggregated or averaged). There is a lack of consensus as to what constitutes underachievement, with McCoach and Siegle proposing that students identified in the top 25% who perform in the bottom 50% are underachievers (McCoach & Siegle, 2003a). As such, the identification of students as underachieving in this sample based on the ‘C’ grading was chosen to reflect the nature of reporting student achievement in NSW. All schools are required to report student achievement using Grades A-E, with A being the
highest level reported. Schools in NSW are not required to report using percentages, or to a bell curve, nor do schools in the sample use GPA to communicate student achievement. Further, the data was not available to the researcher to analyse the distribution of grades. However, a C grade in many schools is indicative of average performance for that grade, or between the 50th and 65th percentiles. As such, the participants in this study have been identified as having capacity to perform in the top 10%, according to the placement assessments students have sat and these are more likely to reflect their capacity in these academic subjects and yet they are performing in the bottom 65% in the core academic subjects.

Participants identified as underachieving gifted students comprised 20% of the sample ($N = 118$), whereas participants identified as achieving gifted students made up 80% of the sample ($N = 477$). No data was available on the number of students who did not participate as the participants were recruited within the schools for privacy reasons.

### 3.8. Data Collection Instruments

Measurements of attitudes and beliefs are commonly collected in the field of psychology and educational psychology by employing self-report questionnaires (Cunningham, Preacher, & Banaji, 2001). Further, much of the research carried out on gifted underachievers has utilised surveys for data collection (Chan, 2003b, 2005; Dunn, Baguley, & Brunsden, 2013; McCoach, 2002; McCoach & Siegle, 2001, 2003a; Muris, 2001; Swiatek, 1995; Swiatek & Cross, 2007; Swiatek & Dorr, 1998). To investigate the degree to which gifted achievers and underachievers differ in their use of social coping strategies, self-efficacy and attitude toward school, three quantitative self-report questionnaires were used.
The surveys adopted had been previously assessed as having suitable reliability and validity (Chan, 2005, 2003a; McCoach & Siegle, 2001a, 2003b; Muris, 2001; Rudasill, Foust & Callahan, 2007; Suldo, Shaffer & Shaunessey, 2008). The efficiency of self-reported survey questionnaires as a research method for collecting information from participants to describe, compare and explain their attitudes, beliefs, and behaviours was considered when designing the research (Creswell, 2005; Croasmun & Ostrom, 2011; McCoach, Gable, & Madura, 2013; Mertens, 2003; Punch, 2003) and this approach was identified as the most efficient way to gather information about these factors and in this context. The size of the population and the desire of the researcher to gather data from many different geographical sites, to increase data reliability (Creswell, 2005; Croasmun & Ostrom, 2011; Mertens, 2003; Punch, 2003), also supported the use of surveys as an efficient way to best collect these data. As multiple hypotheses were being tested in this research, surveys were also a useful way to concurrently assess multiple research questions (Creswell, 2005; Croasmun & Ostrom, 2011; Mertens, 2003; Punch, 2003). Some of the limitations associated with self-report questionnaires, including socially desirable (instead of truthful) responding, lack of self-awareness or a lack of understanding of questionnaire items, were considered in the research design and these issues will be further discussed in the limitations of the study (Chan, 2009).

When choosing surveys to measure the attitudes and beliefs of individuals it is important to use instruments that are valid and reliable. Validity refers to the degree to which the instrument measures what it purports to measure (Gliner, Morgan, & Leech, 2009). In contrast, reliability refers to the consistency with which the instrument measures the intended outcomes (Gliner et al., 2009). Validity and reliability can be assessed using a variety of approaches. While there are many approaches to evaluating the validity of a data collection
instrument, a common approach in educational research is to evaluate construct validity using factor analytic techniques. In addition, Cronbach’s alpha statistics are often used to assess the internal consistency (reliability) of the items in the survey (Tavakol & Dennick, 2011). These were the approaches adopted for evaluating the survey instruments in the current study. For Cronbach’s alpha calculations, a statistic of .70 was set as the minimum acceptable level, consistent with previously established rules of thumb (Creswell, 2005; Takavol & Dennick, 2011).

The survey questionnaire instrument used for this study was a combination of all items from three surveys, each of which had been established as acceptable instruments in previous studies. Each of the survey instruments used statements that allowed participants to rate their responses to the questionnaire items about their attitudes, beliefs or behaviours, using a Likert scale format. These are outlined as follows.

3.8.1. Social Coping Questionnaire

The Social Coping Questionnaire (SCQ); (Swiatek, 2001) was one instrument used in this study. This survey assesses students’ beliefs and actions related to various social aspects of being academically gifted, in the form of social coping strategies. The social coping strategies assessed have been identified in the literature as being associated with behaviours to help individuals cope with perceiving themselves as, or being identified as, intellectually gifted. The scale is the only scale that could be found that assesses the social coping strategies of gifted individuals.

Participants completed the 34-item questionnaire by responding to the items on a 7-point Likert scale to identify how true each item was for them (1 = strongly true, 2 =
moderately true, 3 = somewhat true, 4 = neither true nor false, 5 = somewhat false, 6 = moderately false, 7 = strongly false). Some sample items include: “People think that I am gifted but they are mistaken” and “People think of me as the class clown”.

The scale, developed by Swiatek in 2001, was chosen for this study as it had been previously tested with gifted adolescent students (the current population of interest) and was designed to assess the relationship between social coping and underachievement. The scale in the 2001 study comprised seven factors: denying giftedness, peer acceptance, humour, activity level, conformity, helping others and focus on popularity. Later versions of the scale were assessed using different samples, including elementary school students in a later study by Swiatek (2002) and a Hong Kong cohort in Chan’s (2003a, 2004, 2005) studies. However, these later alterations were deemed less culturally appropriate for an Australian context (e.g., additional factors introduced in Chan’s scale were valuing peer acceptance and attempting avoidance). Further, the original version of the scale has been noted to function more effectively with adolescents than with younger children and thus was the most appropriate version for the chosen population Chan, 2005; Swiatek 2001, 2002). The researcher used all aspects of the 2001 version of the questionnaire in the research to examine the components of social coping as measured by this survey.

This instrument has been validated in at least eight studies (Chan, 2003a, 2004, 2005; Rudasill & Callahan, 2007; Swiatek, 1995, 2001, 2002; Swiatek & Dorr, 1998). These studies have provided evidence of internal consistency through factor analysis, as well as evidence of test-retest reliability and construct validity of the scale. The reliability of the scale has also been assessed in terms of internal consistency (Chan, 2003a, 2003b, 2005; Swiatek, 2001). In all analyses, the reliability coefficients of the instrument ranged between .53 and .82. The
2001 version of the scale had the most consistent internal reliability with an adolescent cohort, with a Cronbach’s alpha range of .61 to .79, which were identified by the author as acceptable (Swiatek, 2001). Despite these less-than-ideal reliability estimates, this scale has been widely used due to the lack of alternatives appropriate for use with gifted adolescents. The utility of this scale is further supported by evidence that those with low scores are likely to underachieve in school, and as such should be useful in identifying underachieving gifted students (Chan, 2003a, 2003b, 2004, 2005; Swiatek, 1995, 2001, 2002; Swiatek & Dorr, 1998).

### 3.8.2. School Attitude Assessment Survey – Revised

The *School Attitude Assessment Survey - Revised* (SAAS-R); (McCoach, 2002) was used to assess students’ attitude toward school. The survey has been utilised to predict achievement and underachievement, as well as identify the factors related to underachievement (McCoach, 2002; McCoach & Siegle, 2003b). It has also been utilised in the identification of appropriate interventions for underachievers, based on the factors influencing their underachievement (Rubenstein et al., 2012a). The instrument is a 43-item self-report survey that measures attitude toward school and teachers, academic self-perceptions, motivation and self-regulation, and goal valuation. Participants complete the questionnaire by responding to the items on a 7-point Likert scale (1 = strongly true, 2 = moderately true, 3 = somewhat true, 4 = neither true nor false, 5 = somewhat false, 6 = moderately false, 7 = strongly false). Some examples of the items include “Doing well at school is important to my future”, and “Most of the teachers at this school are good”.
The instrument has been validated by its creators (McCoach, 2002; McCoach & Siegle, 2003b) and others (Suldo et al., 2008). The instrument has evidence of construct validity (McCoach, 2000; McCoach & Siegle, 2003c), criterion-related validity (McCoach & Siegle, 2003c; Suldo et al., 2008) and convergent validity (Suldo et al., 2008). The reliability of the scale has also been assessed by the authors who examined internal consistency reliability (McCoach & Siegle, 2003c), as well as by independent researchers (Suldo et al., 2008). In all analyses, the reliability coefficients of the instrument did not fall below a Cronbach’s alpha of .85. This was further supported by Suldo et al. (2008), who found that all items loaded on the expected factors (i.e., academic self-perception, motivation and self-regulation, goal valuation, attitude to school and attitude to teachers, all with factor loadings >.30). The reliability and validity of the scale was one of the reasons this scale was chosen for use in this study. All items in this questionnaire were utilised in this study to assess participants’ attitude toward school.

3.8.3. Self-Efficacy Questionnaire for Children

The Self-Efficacy Questionnaire for Children (SEQC); (Muris, 2001) was used to assess the participants’ perceived self-efficacy. The SEQC is a 21-item self-report instrument intended to measure adolescents’ beliefs about their competencies in three areas: social, academic and emotional. Participants complete the questionnaire by responding to the items on a 5-point Likert scale (1 = not at all well, 2 = less well than I would like, 3 = neither well nor not well, 4 = well, 5 = very well). Some example items include “How well do you succeed in passing all subjects?” and “How well do you succeed in staying friends with other children?”
The SEQC shows good reliability, with Cronbach’s alpha of .88 for the total self-efficacy score and between .85 and .88 for the subscale scores (Muris, 2001). The utility of this scale is supported by evidence that those with low scores on this scale are at increased risk for depression (Muris, 2001, 2002) and increased susceptibility to peer pressure (Suldo & Shaffer, 2007). Both of these dependent variables may play an important role related to the social coping strategies used by gifted students to gain peer acceptance (Swiatek, 2001). This questionnaire was used to identify levels of self-efficacy in various areas (i.e., academic, social, and emotional self-efficacy). The researcher used all items in the questionnaire to compare the various aspects of self-efficacy.

3.9. Data Collection Procedures

3.9.1. Ethics approval

In order to gather data from the selected schools and to administer the instrument, permission from several sources had to be obtained. The research as described here was approved by the University of Wollongong Human Research Ethics Committee, as well as all relevant education bodies (i.e., SERAP for NSW Department of Education schools, Catholic Schools Office for Catholic schools in the Diocese in which the research was located, and individual school consent for each independent school). Participating schools were those that gave consent to participate through the appropriate governing body and the individual school principal. Following on from gaining systemic and school consent, the participants were those who attended schools that had consented to partake in the study and
had provided personal informed written consent as well as informed written consent from their parents.

### 3.9.2. Contact with principals of each school

In order to carry out the research at the designated schools once ethics approval from the university and either SERAP or the appropriate governing body approved the research, it was necessary to gain permission from the principal of each school. The investigator approached each school principal and explained the aims of the research and the procedures of data collection. In addition, a summary of the research proposal with a cover letter, and ethical approval from the investigator’s university, as well as sample consent letters for participants and parents/guardians were sent via e-mail from the researcher to the principal of each school. Permission was granted by eight schools.

Next, permission was obtained from each school as is necessary for ethical research. Each principal appointed a liaison person; a teacher within the school with whom the researcher communicated to organised the data collection procedures on site.

### 3.9.3. Participants’ permission

Participants were given information about the research project and the survey questionnaire from the appointed liaison. They were asked to indicate their consent by reading and signing the letter of consent and, as the participants were under 18 years of age, they were also required to obtain consent from their parent/guardian. Invited participants were informed that they were under no obligation to participate in the research and that
participation would in no way impact on their schooling or relationship with the university. Participants were informed in the information given that they could withdraw from the research at any point.

3.9.4. Pilot study

Prior to administering the instrument to the chosen sample, and even though each part of the instrument was used from previous studies that tested validity and reliability, it was necessary to administer the instruments to a pilot group. This was to ensure that respondents fully understood each question and response for each part of the instrument. The sample size for this pilot study was 25 identified gifted students in the researcher’s school. The responses from these participants were not included in the research results.

During the pilot study, participants were asked to comment on the intelligibility of the statements and questions, and identify any difficulties they come across and changes that they would make to address these problems. They were also invited to include any thoughts or ideas that they believed were helpful. Based on the comments that were made, several minor changes were made to layout of the instrument prior to administering the instrument to the entire sample. The changes were only small, such as the way in which some of the sections were formatted (i.e., having the Likert scale score headings clearer) and placing the participant’s identification of gender and grade at the end of the survey. The items on the questionnaire itself did not require additional clarification or rewording.

3.9.5. Administration of instrument
After gaining permission from each school to administer the survey, the investigator contacted each appointed liaison who would be administering the questionnaire within their school. The investigator explained to the liaison the aims and procedures of the study, gave an overview of the survey instrument and discussed the study’s method of identifying underachieving gifted students. Each liaison was sent paper surveys by mail, participant information sheets and consent forms for participants and their parent/guardian. In addition, liaisons were provided with a set of instructions for survey administration, including an Excel spreadsheet from which the liaison de-identified students (by assigning a random number and having the student use that Subject ID on their survey, prior to returning the surveys to the researcher). The liaison was also provided with grading guidelines to identify underachieving students (achieving a grade C or below in three of the following five core subject areas: Mathematics, English, Science, History or Geography), which they denoted against the Subject IDs in the Excel spreadsheet. Each liaison was asked to follow these written set of procedures in administering the survey.

Paper survey questionnaires were to be completed by each participant in one sitting at a negotiated time agreed for that school. The surveys were administered in the fourth term of the academic year, after students’ final grades had been collated. The surveys were administered in one sitting with the SAAS-R first, following by the items from the SEQC and then the items from the SCQ. In schools 5 – 8, the survey was administered in reverse order to attempt to counteract fatigue. Students were reminded, by the individuals administering the surveys, that participation in the study was voluntary. The survey instruments, for ease of administration, were combined into a single survey, yet item order
was retained with surveys separated across the pages. Administration of the questionnaires took about 30 minutes and occurred at the convenience of the school.

3.10. Data Analysis

Prior to analysis, data was entered into SPSS by a paid assistant, which was then checked for accuracy by the researcher.

Stage one of the analysis procedure involved general descriptive analyses of the data to gain an understanding of patterns and anomalies. An Exploratory Factor Analysis (EFA) was then conducted to investigate the underlying structures of the three survey instruments. The aim was to examine the factors in each of the three already validated surveys in an Australian context. Correlational analyses were also conducted to further assess the size and relationship between the factors extracted from EFA. This permitted exploration of how patterns of relationships between these factors differed between achieving and underachieving participants. In order to assess the difference between the correlations for achievers and underachievers, Fisher’s z tests were conducted. A further chi-square test was used to evaluate whether school type, gender or year level were related to achievement. To explore the differences between gifted achievers and gifted underachievers on the survey instruments, t-tests were then conducted to compare the means of the gifted achievers and underachievers on each subscale in the three scales. Lastly, logistic regression was performed to assess the extent to which factors previously found to relate to underachievement (i.e., academic self-efficacy, attitude to school, social coping strategies) predicted teachers’ classifications of students as achieving or underachieving. Additionally, receiver operating characteristic (ROC) curve analysis was undertaken to test whether the instruments may be
useful in identifying the level of risk of underachievement for individual students within a self-contained gifted context. ROC curve analyses were used to examine the overall discriminatory power, sensitivity and specificity, and corresponding cut-off points of factors identified by the logistic regression as predicting group membership (i.e., achieving or underachieving). The overall performance of each factor for predicting achievement level was assessed by computing the area under the curve (AUC). The cut off points for factors with high overall performance were determined at the point on the curve where the sum of sensitivity and specificity was, on balance, able to capture enough of the cohort to provide useful information as to diagnosing the level of achievement.

The cut off value of 24 or below was set for motivation/self-regulation, as, on balance, it had good validity in predicting the outcome variables (achievement level). The sensitivity and specificity for this cut off value were respectively 0.69 and 0.49 for predicting achievement level. The cut off value of 28 or above was set for social self-efficacy, as, on balance, it had good validity in predicting the outcome variables (achievement level). The sensitivity and specificity for this cut off value were respectively 0.61 and 0.62 for predicting achievement level. The variables of gender and school type being dichotomous variables did not need cut off points assigned. To assess the performance of the factors and variables the motivation/self-regulation and social self-efficacy factors were then transformed into a value of 0 or 1, with scores over 24 on the motivation scale being assigned a value of 0 (achiever) and scores below being assigned a value of 1 (underachiever); similarly, scores under 28 on the social self-efficacy scale were assigned a value of 0 (achiever) and for those scores over 28 a value of 1 (underachiever). Females were assigned a value of 0 and males were assigned a value of 1, and students attending a partly selective high school were assigned a value of 0.
and a fully selective high school a value of 1. For all transformed variables, 1 represented a variable predicting underachievement and 0 was the variable more likely to predict achievement.

### 3.11. Chapter Summary

This chapter discussed the purpose and design of the research study, the sample recruited for the study, the survey instruments used to collect the data, the procedure for collection of data and the process of analyses conducted. The method used in this study permitted evaluation of the survey instruments for use in the Australian gifted context. Once established, subsequent analyses permitted evaluation of how social coping strategies, self-efficacy and students’ attitude toward school were differentially related between gifted achievers and underachievers, which of the factors differentiated gifted achievers from underachievers and the extent to which these factors uniquely (and combined) predicted underachievement. The hypotheses that were tested in this research and the results of these analyses will be discussed in Chapter 4.
Chapter 4. Results

4.1. Plan for Analysis

The purpose of this chapter is to report and discuss the findings of the research, with reference to the identified research questions, and is structured to communicate the results of these analyses. The first section presents an evaluation of the psychometric properties of the chosen scales within the Australian context, to examine the usefulness of these scales outside of the original research settings. Second, an exploration of the relationship between the subscales was undertaken to compare the relationships among extracted factors, such as attitude toward school, self-efficacy, and social coping strategies, in achievers and underachievers. Third, the extent to which demographic factors were related to achievement status was evaluated using chi square analyses. Fourth, differences in the self-efficacy, social coping and attitudinal characteristics of gifted achievers and underachievers were examined using t-test analyses. Finally, an analysis of the extent to which self-efficacy, attitude toward school and social coping strategies predict underachievement was examined. Taken together, results of these analyses were expected to provide a comprehensive profile of the demographic and personal characteristics of gifted achievers and underachievers, as well as the extent to which knowledge of the factors could predict achievement status.
4.2. Validity and Reliability in the Australian Context: Exploratory Factor Analysis (EFA)

To investigate how the adopted scales function in the Australian context with gifted adolescents in ability-grouped classes, an Exploratory Factor Analysis (EFA) was run for each scale. EFA was chosen to assess the scales used in this study as the scales had not previously been used with samples of gifted students who were placed in self-contained gifted classes. Additionally, neither the SAAS-R nor the SCQ had been used in Australia. With the nature of the contexts being different, the researcher did not want to presume the factor structure was identical to previous applications in other contexts. EFA permitted evaluation of the construct validity of each scale, prior to subsequent analyses. The study met the sample size criteria for EFA (a very good sample size based on established rules of thumb with a ratio of 40:1 which is beyond the recommended ratio of participants to factors which is 10:1 for stable factors and 30:1 for cross validation (Comrey, 1973) and also above the good size recommended being samples of 300 or more (Field, 2009a). The data were screened for univariate outliers and the homogeneity assumption for this sample was met. The reliability of the extracted factors (subscales) was then assessed using Cronbach’s alpha, which is used to determine inter-item reliability. Cronbach’s alpha is the most widely used index of reliability in educational and psychological research (Gliner et al., 2009).

First, EFA factors were extracted using maximum likelihood estimation with a direct oblimin rotation, because factors were correlated. Second, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett’s Test of Sphericity were examined to confirm the data were suitable for factor analysis. In all cases, the KMO measure of sampling adequacy (all > .74) and Bartlett’s Test of Sphericity (all $ps < .001$) indicated that the data
were appropriate for factor analysis. The number of factors extracted was determined based on eigenvalues greater than one, examination of scree plots and importantly, interpretability. Items were then individually evaluated based on factor loadings > .40. Finally, a Cronbach’s alpha reliability coefficient was calculated for all extracted factors that met the criteria. Results of the EFA were used to generate subscale scores for use in subsequent analyses.

4.2.1. Factor solution and Exploratory Factor Analysis of the School Attitude Assessment Survey - Revised (SAAS-R).

An EFA was conducted to assess the number of factors measured by the SAAS-R in the Australian context. The EFA yielded five interpretable factors with eigenvalues > 1, accounting for 33.87%, 10.08%, 9.41%, 6.95%, and 4.02% of the variance. The scree plot also supported a five-factor solution. Factor loadings can be seen in Table 4.1. Consistent with previous research (McCoach, 2002; Suldo, Shaffer, & Shaunessy, 2008), the five subscales can be interpreted as Motivation/Self-Regulation, Academic Self-Perception, Attitude to Teachers, Goal Valuation, and Attitude to School. All scales were reliable according to common rules of thumb for Cronbach’s alpha (all > .84).
Table 4.1. Factor Solution for School Attitudes Assessment Survey - Revised with Cronbach’s Alpha

<table>
<thead>
<tr>
<th>Factor/Item</th>
<th>Factor loading</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1 – Motivation/Self-Regulation</strong></td>
<td></td>
<td>.92</td>
</tr>
<tr>
<td>I spend a lot of time on my schoolwork</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td>I put a lot of effort into my schoolwork</td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>I complete my schoolwork regularly</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>I am self-motivated to do my schoolwork</td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td>I concentrate on my schoolwork</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>I check my schoolwork before I turn it in</td>
<td>.74</td>
<td></td>
</tr>
<tr>
<td>I am organised about my schoolwork</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>I work hard at school</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td>I am a responsible student</td>
<td>.61</td>
<td></td>
</tr>
<tr>
<td>I use a variety of strategies to learn</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 2 – Academic Self-Perception</strong></td>
<td></td>
<td>.90</td>
</tr>
<tr>
<td>I am smart in school</td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>I am intelligent.</td>
<td>.81</td>
<td></td>
</tr>
<tr>
<td>I can learn new ideas quickly in school</td>
<td>.78</td>
<td></td>
</tr>
<tr>
<td>I am good at learning new things in school</td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td>I grasp complex concepts in school</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>School is easy for me</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td>I am capable of getting straight A’s</td>
<td>.70</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 3 – Attitude to Teachers</strong></td>
<td></td>
<td>.91</td>
</tr>
<tr>
<td>I like my teachers</td>
<td>-.85</td>
<td></td>
</tr>
<tr>
<td>I relate well to my teachers.</td>
<td>-.80</td>
<td></td>
</tr>
<tr>
<td>My teachers care about me.</td>
<td>-.79</td>
<td></td>
</tr>
<tr>
<td>I like my classes</td>
<td>-.75</td>
<td></td>
</tr>
<tr>
<td>Teachers make my learning interesting</td>
<td>-.73</td>
<td></td>
</tr>
<tr>
<td>Most of the teachers at this school are good teachers</td>
<td>-.66</td>
<td></td>
</tr>
<tr>
<td>My classes are interesting</td>
<td>-.64</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 4 – Goal Valuation</strong></td>
<td></td>
<td>.89</td>
</tr>
<tr>
<td>It is important for me to do well in school</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td>It is important to get good grades in school</td>
<td>.83</td>
<td></td>
</tr>
<tr>
<td>I want to get good grades in school</td>
<td>.78</td>
<td></td>
</tr>
<tr>
<td>Doing well in school is one of my goals</td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td>I want to do my best in school</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>Doing well in school is important for my future career goals</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 5 – Attitude to School</strong></td>
<td></td>
<td>.84</td>
</tr>
<tr>
<td>This school is a good match for me</td>
<td>.82</td>
<td></td>
</tr>
<tr>
<td>I am glad I go to this school</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>I am proud of this school</td>
<td>.68</td>
<td></td>
</tr>
</tbody>
</table>
4.2.2. Factor solution and Exploratory Factor Analysis of the Self-Efficacy Questionnaire for Children.

An EFA was also conducted to assess the number of factors measured by the Self-Efficacy Questionnaire for Children (SEQC) in the Australian context with gifted adolescents in ability-grouped classes. EFA results produced three interpretable factors with eigenvalues > 1, accounting for 26.85%, 9.23% and 7.54% of the variance. In addition, the scree plot supported a three-factor solution. Items with a factor loading of less than .40 were eliminated from subsequent analyses. Specifically, in this questionnaire, “How well can you tell a friend that you don’t feel well?” was eliminated from further analysis. Factor loadings can be seen in Table 4.2. Consistent with prior research, the three extracted subscales can be interpreted as Social Self-Efficacy, Emotional Self-Efficacy and Academic Self-Efficacy. All subscales were found to be reliable, with Cronbach alpha statistics of at least .73.
| Table 4.2. Factor Solution for SEQC with Cronbach’s Alpha |
|-----------------------------------------------|-------------|
| Factor/Item | Factor loading | Cronbach’s Alpha |
| **Factor 1 – Social Self-Efficacy** | | .83 |
| How well can you express your opinions when other classmates disagree with you? | .65 | |
| How well can you become friends with other children? | .84 | |
| How well can you have a chat with an unfamiliar person? | .82 | |
| How well can you work in harmony with your classmates? | .61 | |
| How well can you tell other children that they are doing something that you don’t like? | .49 | |
| How well can you tell a funny event to a group of children? | .75 | |
| How well do you succeed in staying friends with other children? | .65 | |
| How well do you succeed in preventing quarrels with other children? | .43 | |
| How well can you express your opinions when other classmates disagree with you? | .65 | |
| How well can you become friends with other children? | .84 | |
| **Factor 2 – Emotional Self-Efficacy** | | .79 |
| How well do you succeed in cheering yourself up when an unpleasant event has happened? | .61 | |
| How well do you succeed in becoming calm again when you are very scared? | .75 | |
| How well can you prevent to become nervous? | .73 | |
| How well can you control your feelings? | .67 | |
| How well can you give yourself a pep talk when you feel low? | .66 | |
| How well do you succeed in suppressing unpleasant thoughts? | .51 | |
| How well do you succeed in not worrying about things that might happen? | .65 | |
| **Factor 3 – Academic Self-Efficacy** | | .73 |
| How well can you get teachers to help you when you get stuck on schoolwork? | .47 | |
| How well can you study when there are other interesting things to do? | .47 | |
| How well can you study a chapter for a test? | .65 | |
| How well do you succeed in finishing all your homework every day? | .55 | |
| How well can you pay attention during every class? | .68 | |
| How well do you succeed in passing all subjects? | .71 | |
| How well do you succeed in satisfying your parents with your schoolwork? | .65 | |
| How well do you succeed in passing a test? | .71 | |
| How well can you get teachers to help you when you get stuck on schoolwork? | .47 | |
| **Items Eliminated** | | |
| How well can you tell a friend that you don’t feel well? | .38 | |
4.2.3. Factor solution and Exploratory Factor Analysis of the Social Coping Questionnaire.

An EFA was conducted to assess the number of factors measured by the Social Coping Questionnaire (SCQ) in the Australian gifted context. Initial factor analysis extracted 10 factors, which was not consistent with the model proposed and found by the questionnaire’s authors (Swiatek, 1995; Swiatek & Cross, 2007; Swiatek & Dorr, 1998). Conversely, the scree plot indicated that a seven-factor solution was more appropriate. As such, this initial factor solution (based on eigenvalues) was deemed unsatisfactory. To examine the model proposed by the authors, a second factor analysis was conducted using a fixed factor approach, in which the number of extracted factors was fixed to seven. EFA results produced seven interpretable factors with eigenvalues > 1, accounting for 11.64%, 8.99%, 7.26%, 5.88%, 4.72%, 4.55% and 3.93% of the variance.

An examination of factor loadings indicated that not all items loaded well on their originally identified factor. For instance, item 8 “I don’t tell people that I am gifted” and item 33 “I prefer doing things alone over doing things with other people” were not loading well on any factor. Item 13 was also eliminated, because the dual nature of the question seemed to cause the item to the cross-load on two factors at an almost identical level of .46 and .49. These items were thus eliminated from further analysis. A number of additional items were eliminated from further analysis due to factor loadings < .40 (see Table 4.3). Removal of these items resulted in the factors ‘Activity Level’ and ‘Conformity’ being removed from subsequent analyses as the factors then only contained two items, which was not considered sufficient to provide a valid and reliable estimate of these constructs. As such, Cronbach’s alpha scores were not calculated for these factors of the Social Coping Questionnaire scale.
Factors with low reliability as measured by Cronbach’s alpha were also removed from subsequent analyses. Generally consistent with previous research, the extracted factors can be interpreted as Denying Giftedness, Activity Level, Focus on Popularity, Helping Others, Humour, Conformity and Peer Acceptance. However, these subscales were largely unreliable, with only two at acceptable levels of reliability (Denying Giftedness, Humour) and the others with unacceptable levels of reliability (i.e., Activity Level, Focus on Popularity, Helping Others, Conformity, Peer Acceptance). Cronbach’s alpha statistics are influenced by low numbers of items, which was possibly the case with these factors, however they did not meet the established criteria and thus were removed. However, the Humour factor had only three items yet had a Cronbach’s alpha level above .70 (and as such was retained for subsequent analyses). Nevertheless, subscales with low alpha levels were excluded from subsequent analyses. Overall, the Social Coping Questionnaire as a complete scale was not found to be reliable within the Australian gifted context in the current study. Only the two reliable factors from this scale were utilised in subsequent analyses. This scale should be further assessed to analyse its usefulness in other contexts.
Table 4.3. Factor Solution for Social Coping Questionnaire with Cronbach’s Alpha

<table>
<thead>
<tr>
<th>Factor/Item</th>
<th>Factor Loading</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1 - Denying Giftedness</strong></td>
<td></td>
<td>.79</td>
</tr>
<tr>
<td>People think that I am gifted but they are mistaken</td>
<td>.83</td>
<td></td>
</tr>
<tr>
<td>I don’t think that I am gifted</td>
<td>.78</td>
<td></td>
</tr>
<tr>
<td>I am not gifted I am just lucky in school</td>
<td>.65</td>
<td></td>
</tr>
<tr>
<td>Most of the successes I experience are due to luck</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>There are many people who are more gifted than I Am</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 2 - Activity Level</strong></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>I find friends who have interests similar to mine by getting involved in extracurricular activities</td>
<td>-.41</td>
<td></td>
</tr>
<tr>
<td>I spent a lot of time on extracurricular activities</td>
<td>-.50</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 3 - Focus on Popularity</strong></td>
<td></td>
<td>.58</td>
</tr>
<tr>
<td>I don’t worry about my popularity</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>It doesn’t matter what other people think of me</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td>Being popular is not important in the long run</td>
<td>.48</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 4 - Helping others</strong></td>
<td></td>
<td>.68</td>
</tr>
<tr>
<td>People come to me for help with their homework</td>
<td>-.56</td>
<td></td>
</tr>
<tr>
<td>I explain course material to other students when they don’t understand it</td>
<td>-.71</td>
<td></td>
</tr>
<tr>
<td>I try to use what I know to help others</td>
<td>-.70</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 5 – Humour</strong></td>
<td></td>
<td>.75</td>
</tr>
<tr>
<td>I tell a lot of jokes in school</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td>I’m good at making people laugh</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>People think of me as a class clown</td>
<td>.63</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 6 – Conformity</strong></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>I try to act very much like other students act</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>I try to look similar to other students</td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 7 – Denying Negative Peer Acceptance</strong></td>
<td></td>
<td>.50</td>
</tr>
<tr>
<td>Being gifted does not hurt my popularity</td>
<td>.43</td>
<td></td>
</tr>
<tr>
<td>If I were not gifted, people would not like me any more or less than they do now</td>
<td>.45</td>
<td></td>
</tr>
<tr>
<td>Other students do not like me any less because I am Gifted</td>
<td>.60</td>
<td></td>
</tr>
</tbody>
</table>
4.3. Differences in Relationships Between Extracted Factors for Achievers vs. Underachievers: Spearman’s Rho Rank Order Correlational Analysis

To assess differences in the patterns of relationships between the questionnaire subscales as a function of whether students were identified as achieving or underachieving, Spearman’s rho rank order correlations were calculated. This statistic was chosen as the data had violated the assumptions of normality (as evidenced by a significant Shapiro-Wilk statistic and examination of histograms), thus prohibiting the use of Pearson’s $r$ correlation. Spearman’s rho rank order correlations between subscales can be found in Table 4.4. As expected, many of the factors correlated and there were many similarities between the groups. The correlations that were most similar were academic self-efficacy being related to all

<table>
<thead>
<tr>
<th>Removed items</th>
<th>Achievers</th>
<th>Underachievers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Because of all my activities, I don’t have time to worry about whether or not I am popular</td>
<td>-.49</td>
<td>.46</td>
</tr>
<tr>
<td>I prefer doing things alone over doing things with other people</td>
<td>-.14</td>
<td></td>
</tr>
<tr>
<td>I hide my giftedness from other students</td>
<td>.29</td>
<td></td>
</tr>
<tr>
<td>As I get older and academic work gets more difficult, people will stop seeing me as gifted</td>
<td>.39</td>
<td></td>
</tr>
<tr>
<td>I try not to be too successful at the things I do</td>
<td>.32</td>
<td></td>
</tr>
<tr>
<td>I don’t tell people that I am gifted</td>
<td>.21</td>
<td></td>
</tr>
<tr>
<td>Most people see me as serious</td>
<td>-.33</td>
<td></td>
</tr>
<tr>
<td>I spend part of my time in group study Sessions</td>
<td>-.37</td>
<td></td>
</tr>
<tr>
<td>I keep myself quite busy most of the Time</td>
<td>-.31</td>
<td></td>
</tr>
<tr>
<td>I try to get involved in sports so people don’t think of me as a “geek”</td>
<td>.34</td>
<td></td>
</tr>
<tr>
<td>I would fit in better if I were not gifted</td>
<td>.34</td>
<td></td>
</tr>
<tr>
<td>I don’t like to give the appearance of being studious</td>
<td>.24</td>
<td></td>
</tr>
<tr>
<td>I try not to tell people my test grades</td>
<td>.19</td>
<td></td>
</tr>
</tbody>
</table>
factors except the use of humour, for which there was no correlation for either group. Also, motivation had a strong correlation with academic self-efficacy beliefs for both groups.

Similarly, for both groups, attitude toward teachers and attitude toward school were highly correlated, as they were with motivation and goal valuation.

**Table 4.4. Correlations of Factors for Achievers and Underachievers**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Academic self-efficacy</td>
<td>-</td>
<td>.39**</td>
<td>.34**</td>
<td>.52**</td>
<td>.46**</td>
<td>.40**</td>
<td>.25*</td>
<td>.66**</td>
<td>-.12*</td>
<td>.06</td>
</tr>
<tr>
<td>2. Social self-efficacy</td>
<td>.34**</td>
<td>-</td>
<td>.40**</td>
<td>.27**</td>
<td>.28**</td>
<td>.26**</td>
<td>.10*</td>
<td>.26**</td>
<td>-.12*</td>
<td>-.09</td>
</tr>
<tr>
<td>3. Emotional self-efficacy</td>
<td>.39**</td>
<td>.47**</td>
<td>-</td>
<td>.28**</td>
<td>.25**</td>
<td>.22**</td>
<td>.00</td>
<td>.21**</td>
<td>.11*</td>
<td>-.09</td>
</tr>
<tr>
<td>4. Academic self-perception</td>
<td>.48**</td>
<td>.31**</td>
<td>.40**</td>
<td>-</td>
<td>.38**</td>
<td>.32**</td>
<td>.31**</td>
<td>.46**</td>
<td>-.30**</td>
<td>-.04</td>
</tr>
<tr>
<td>5. Attitude to teachers</td>
<td>.37**</td>
<td>.05</td>
<td>.15*</td>
<td>.25**</td>
<td>-</td>
<td>.64**</td>
<td>.22**</td>
<td>.52**</td>
<td>-.18*</td>
<td>-.02</td>
</tr>
<tr>
<td>6. Attitude to school</td>
<td>.32**</td>
<td>.22*</td>
<td>.21*</td>
<td>.21*</td>
<td>.55**</td>
<td>-</td>
<td>.21**</td>
<td>.45**</td>
<td>-.16*</td>
<td>.03</td>
</tr>
<tr>
<td>7. Goal valuation</td>
<td>.22*</td>
<td>.13</td>
<td>.05</td>
<td>.16</td>
<td>.43**</td>
<td>.40**</td>
<td>-</td>
<td>.45**</td>
<td>-.11*</td>
<td>.02</td>
</tr>
<tr>
<td>8. Motivation</td>
<td>.64**</td>
<td>.31**</td>
<td>.17</td>
<td>.30**</td>
<td>.42**</td>
<td>.35**</td>
<td>.51**</td>
<td>-</td>
<td>-.14*</td>
<td>-.00</td>
</tr>
<tr>
<td>9. Denying giftedness</td>
<td>-.34**</td>
<td>-.23*</td>
<td>-.14</td>
<td>-.24*</td>
<td>-.14</td>
<td>-.15</td>
<td>-.27**</td>
<td>-.43**</td>
<td>-</td>
<td>.17*</td>
</tr>
<tr>
<td>10. Humour</td>
<td>-.10</td>
<td>-.23*</td>
<td>-.10</td>
<td>-.20*</td>
<td>.09</td>
<td>-.02</td>
<td>.04</td>
<td>.03</td>
<td>.13*</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note.* Academic self-efficacy, social self-efficacy and emotional self-efficacy were drawn from the Self-Efficacy Questionnaire for Children. Academic self-perception, attitude toward teachers, attitude toward school, goal valuation and motivation factors were derived from the SAAS-R and Denying giftedness and humour were derived from the Social Coping Questionnaire. Achievers correlations are reported in the top-right of the table and underachiever correlations are reported in the bottom-left of the table. *p<.05, **p<.001

However, there were also some notable differences in correlations between factors when analysing the results for the two groups. Specifically, to assess differences in correlations between gifted achievers and underachievers, Fisher z-tests were conducted.
Results indicated significant differences between achievers and underachievers in the relationship between their Goal Valuation and their Attitude to School ($r_{achieve} = .21; r_{under} = .40$), $z = -2.03 \ p = .042$. This suggests that the relationship between an individual’s attitude to school and their goal valuation was stronger for underachievers (i.e., students who believe that school is a worthwhile endeavour have more positive attitude toward school and are more likely to be achievers, as well as the reverse). There was also a significant difference in the relationship between Goal Valuation and Attitude to Teachers ($r_{achieve} = .22; r_{under} = .43$), $z = -2.27, p = .021$. This suggests that attitude toward teachers were more highly related to one’s goal valuation in underachievers (i.e., the more individuals value school the more likely they are to have a positive attitude to teachers, and vice versa). A significant difference was also found in the relationships between Social Self-Efficacy and Attitude to Teachers ($r_{achieve} = .28; r_{under} = .05$), $z = -2.78 \ p = .005$. These results suggest that social self-efficacy had a stronger relationship with one’s attitude to teachers amongst gifted underachievers (i.e., achievers having a more positive attitude to teachers if they had a strong sense of social self-efficacy, but underachievers having a more negative attitude to teachers even if they had a strong social self-efficacy).

In terms of the relationship between the use of social coping strategies and other factors, a number of differences in the relationships were found. A significant difference was found in the relationships between Motivation and Denying Giftedness ($r_{achieve} = -.14; r_{under} = .43$), $z = 2.25, p = .020$. This suggests that motivation, and particularly lack thereof, was more highly related to a use of ‘denying giftedness’ as a social coping strategy amongst underachievers. Additionally, significant differences were found in the relationship between the use of denying giftedness as a social coping strategy and academic self-efficacy, ($r_{achieve}$...
Differences in the relationship between these two factors suggest that underachievers with low academic self-efficacy are more likely to report that they deny their giftedness.

Overall, results indicated that goal valuation and social self-efficacy were factors related more highly to school-related attitudes such as attitude toward teachers and school for underachievers than achievers. Further, respondents’ motivation levels and beliefs about their academic self-efficacy were related to their use of denying giftedness as a social coping strategy amongst gifted underachievers in this context.

### 4.4. Demographic Factors Related to Underachievement: Chi-Square Analyses

In order to examine the relationship between achievement level and school type, gender and grade, a Pearson’s chi-square analysis was performed (as the data were nominal). Specifically, a Pearson’s chi-square test of contingencies (with $\alpha = .05$) was used to evaluate whether school type was related to achievement. The chi-square test was statistically significant, $\chi^2(1, N=596) = 11.75, p < .001$, although the association was quite small ($\phi = .14$), with accepted rule of thumb for effect sizes in chi-square being considered small if at the .2 level or lower, moderate at the .5 level and high at the .8 level (Cohen, 1988). Contrary to expectations, results indicated that students in a fully selective environment were more likely to be underachieving than participants from the partly selective contexts.

A second Pearson’s chi-square test of contingencies (with $\alpha = .05$) was used to evaluate whether gender was related to achievement. The chi-square test was statistically significant, $\chi^2(1, N=596) = 19.91, p < .001$, although the association between gender and
achievement was similarly quite small ($\phi = .18$). As expected, male students were more likely to underachieve than female participants, consistent with the hypothesis that males are more likely to underachieve in high school and middle school years of schooling.

A final Pearson’s chi-square test of contingencies (with $\alpha = .05$) was used to evaluate whether grade was related to achievement. The chi-square test was not statistically significant, $\chi^2(2, N=596) = 4.47, p < .1$, indicating that year level or grade level was not associated with achievement level in this study. These results were inconsistent with expectations that there would be greater underachievement in higher grades. In summary, the Pearson chi-square tests of contingencies identified achievement level was related to gender and school type, but not grade level.

4.5. Factors that Differ between Gifted Achievers and Underachievers: T-tests

To explore the differences between gifted achievers and gifted underachievers on the five factors of the SAAS-R, the three factors of the SEQC and the two reliable factors of the SCQ, a succession of t-tests were conducted to compare the means of achievers and underachievers on each of the factors in the three scales.

4.5.1. T-test results for SAAS-R extracted factors

First, a series of t-tests was conducted to compare the means of gifted achievers and gifted underachievers on each of the five factors identified in the SAAS-R factor analysis. First, Levene’s test for equality of variances between the two groups was run. The attitudes
toward teachers, attitude toward school and academic self-perception factors demonstrated equivalent variances between the two groups. The motivation/self-regulation and goal valuation factors had unequal variances and therefore these results were interpreted using Welch t-tests, which correct for this inequality in variances. The Shapiro-Wilk statistic was also significant, indicating the assumption of normality was violated. However, the Welch t-test is considered sufficiently robust to non-extreme violations of normality (z_{skewness} < 3). Effect sizes were calculated for each analysis using Cohen’s d using rule of thumb effect size interpretations of up to 0.32 (small), 0.31–0.55 (moderate) and 0.56–1.20 (large) (Lipsey, 1990). Given the multiple t-test comparisons across all factors on of the scales, each result was initially compared at the rate of \( p > .01 \) to correct for Type 1 error. However, to minimise Type 2 error this was then compared against a \( p > .05 \). As such the results reported are indicative and should be interpreted with caution when the \( p \) level is below \( > .05 \) and may require further investigation.

4.5.2. Investigating achievement group differences on SAAS-R subscales

An independent-samples t-test was first conducted to compare whether gifted achievers \( (n = 476) \) and underachievers \( (n = 119) \) differed in their academic self-perception as measured by the SAAS-R. The test showed a significant difference between achievers and underachievers, \( t(594) = 2.04, p = .042, d = .21 \), such that the academic self-perception for achievers \( (M = 19.58, SD = 6.50) \) was significantly higher than for underachievers \( (M = 18.22, SD = 6.55) \). However, the effect size suggested only a small effect for identified achievement group on actual achievement. Nevertheless, these results suggest that gifted
achievers saw themselves as more academically capable and able to learn than underachievers in a selective or self-contained gifted context.

A subsequent independent-samples t-test was run to investigate group differences in goal valuation (as measured by the SAAS-R). The Welch t-test was statistically significant, \( t(146.23) = 2.61, p = .010, d = .25 \). Achievers had significantly higher levels of goal valuation \( (M = 23.21, SD = 3.21) \) than gifted underachievers \( (M = 22.01, SD = 4.74) \). These results suggest that achievers placed significantly higher value on achieving well at school when compared with underachievers in a self-contained gifted or selective environment. Again, however, the effect size for this difference was unexpectedly small.

An independent-samples Welch t-test on motivation/self-regulation was also statistically significant, \( t(180.37) = 4.32, p < .001, d = .47 \), such that the gifted achievers had higher motivation and self-regulation scores \( (M = 28.21, SD = 10.18) \) than gifted underachievers \( (M = 22.97, SD = 11.98) \). In contrast to the previous differences, there was a moderate effect size characterising this difference.

To compare whether there was any difference between gifted achievers and underachievers in their attitude toward teachers, an independent-samples t-test was conducted. The t-test was statistically significant, \( t(590) = 1.98, p = .048, d = .20 \). Again, achievers displayed more positive attitudes toward teachers \( (M = 16.09, SD = 8.11) \) than underachievers \( (M = 14.43, SD = 8.49) \). The effect size, however, was small.

Lastly, an independent-samples t-test showed no significant difference between achievement groups on attitude toward school, \( t(593) = -0.79, p = .431, d = -.08 \). That is, there was no significant difference between achievers \( (M = 8.71, SD = 4.21) \) and underachievers \( (M = 9.05, SD = 3.80) \) in their attitude to school scores. In summary, there
was a moderately sized difference in motivation/self-regulation between gifted achievers and underachievers, as well as a small but significant difference in their levels of goal valuation, attitudes to their teachers and academic self-perception. There was no significant difference found between achievers and underachievers in their attitude to school.

**4.5.3. T-test results for Self-Efficacy Questionnaire for Children**

A series of t-tests was undertaken to compare whether there was a difference on the three factors measured by the SEQC between gifted achievers and underachievers (Muris, 2001) – that is, academic, social and emotional self-efficacy. All factors demonstrated equivalent variances between the two groups. An independent-samples t-test conducted on the academic self-efficacy factor was statistically significant, \( t(593) = 3.48, p = .001, d = .38 \), such that gifted achievers had a higher mean academic self-efficacy (\( M = 29.39, SD = 6.30 \)) than gifted underachievers (\( M = 27.20, SD = 5.36 \)). An effect size of .38 suggested academic self-efficacy had a moderate effect on achievement level. This suggests that gifted achievers perceived themselves as better able to control their academic behaviours, such as asking for help, knowing how to study, paying attention and passing their subjects, compared to their underachieving counterparts.

Subsequently, an independent-samples t-test was run to compare whether there was a difference between gifted achievers and gifted underachievers in their social self-efficacy. Results indicated a non-significant effect of achievement group, \( t(591) = -0.66, p = .51, d = 0.07 \) such that the mean social self-efficacy for achievers (\( M = 29.61, SD = 5.71 \)) was
comparable to that for gifted underachievers ($M = 30.01, SD = 5.70$). An effect size of 0.07 is not significant.

An independent samples t-test was conducted to evaluate whether there were differences between achievers and underachievers in their emotional self-efficacy. The t-test indicated no significant difference between the groups, $t(594) = -0.18, p = .86, d = 0.02$ such that achievers ($M = 25.79, SD = 6.88$) had emotional self-efficacy scores comparable to those for gifted underachievers ($M = 25.92, SD = 7.64$). An effect size of 0.02 is not significant for this factor.

In summary, academic self-efficacy was the only factor in which there was a significant difference between gifted achievers and underachievers on the SEQC, suggesting that there is a stronger perception amongst gifted achievers about their abilities to manage and engage in behaviours related to academic success. There were no such differences between these two groups when examining social and emotional self-efficacy.

### 4.5.4. T-test results for reliable subscales of the Social Coping Questionnaire

In order to examine differences in social coping strategies of gifted achievers and underachievers, as assessed on reliable subscales of the Social Coping Questionnaire, independent-samples t-tests were run on the SCQ’s Denying Giftedness and Humour subscales. First, Levene’s test for equality of variances indicated unequal variances. Results were thus interpreted using Welch t-tests, which correct for this inequality in variances. The Shapiro-Wilk statistic was also significant, indicating the assumption of normality was
violated. However, the Welch t-test is considered sufficiently robust to non-extreme violations of normality.

To determine if there were differences in denying giftedness between achieving and underachieving gifted students in this sample, an independent-samples t-test was run. A significant difference was found for the Denying Giftedness factor, $t(211.92) = -2.84$, $p = .005$, $d = .28$. Results indicated that the gifted achievers rated themselves as engaging less in the practice of denying giftedness ($M = 11.56$, $SD = 3.30$) than gifted underachievers ($M = 12.40$, $SD = 2.75$). This result suggests that gifted underachievers were more likely to deny their giftedness than gifted achievers in an ability-grouped context.

A subsequent independent-samples t-test was run to assess the differences between achievers and underachievers in their use of humour as a social coping strategy. Results indicated no significant difference between the two groups for this factor, $t(172.64) = -1.13$, $p = .130$, $d = .11$. Achievers ($M = 6.97$, $SD = 2.06$) and underachievers ($M = 7.22$, $SD = 2.21$) were comparable in their ratings of the frequency with they indicated their use of humour as a social coping strategy. In summary, there were significant differences found between achievers and underachievers on only one reliable factor of the social coping scale, with underachievers reporting significantly higher levels of denying giftedness. There was no significant difference between the two groups in their use of humour as a social coping strategy.

4.6. Factors that Predict Underachievement: Logistic Regression
Logistic regression is used to predict and explain nominal or categorical dependent variables from a set of independent variables (Hair, Black, & Anderson, 2010). Specifically, logistic regression assesses the extent to which these independent variables predict the dependent variable. In this case, logistic regression modelling was used to assess which factor, or combination of factors, assessed in the current study, best predicted the classification of a participant as a member of the gifted achiever or underachiever group. The sample exceeded the recommended minimum sample size of at least ten observations per parameter for this analysis (Field, 2009b; Hair et al., 2010; Peng, Lee, & Ingersoll, 2002).

4.6.1. Logistic regression initial model

The initial regression model contained 12 independent variables: academic self-efficacy, social self-efficacy, and emotional self-efficacy, as measured by the SEQC; motivation/self-regulation, goal valuation, academic self-perception, attitude to school, and attitude to teachers, as measured by the SAAS-R; and denying giftedness and humour, as measured by the SCQ; as well as gender and school type. The full model containing all predictors was statistically significant $\chi^2 (12, N = 596) = 73.80, p = .001$, indicating that the model with all 12 variables was able to distinguish between respondents identified as achieving and underachieving. The model explained 12%-19% of the variance in achievement level and correctly classified 80.5% of cases. The model chi-square $\chi^2$ was 73.80 with 2 df. The Cox and Snell R2 was .12. The Nagelkerke R2 was .19, and the Hosmer and Lemeshow goodness of fit index was 11.98 with 8 df ($p = .15$). However, because of multicollinearity among the 12 factors, the Wald test revealed that only six of the 12 factors (motivation/self-regulation, attitudes toward school, denying giftedness, social self-efficacy,
gender, school type; see Table 4.5) were statistically significant predictors of classification as a member of the achiever or underachiever group. Academic self-perceptions; attitudes toward teachers; academic, and emotional self-efficacy; and the social coping strategy of humour were not significant predictors of classification status in the logistic regression model.

Table 4.5. Results of Logistic Regression Analysis for All Factors

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95% CI for odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>lower</td>
</tr>
<tr>
<td>Academic Self-Perceptions</td>
<td>-.01</td>
<td>.02</td>
<td>0.23</td>
<td>.63</td>
<td>.99</td>
<td>0.95</td>
</tr>
<tr>
<td>Goal Valuation</td>
<td>-.04</td>
<td>.03</td>
<td>1.68</td>
<td>.20</td>
<td>.96</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Motivation/ Self-regulation</strong></td>
<td>-.03</td>
<td>.02</td>
<td>3.42</td>
<td>.05</td>
<td>.973</td>
<td>.94</td>
</tr>
<tr>
<td>Attitude towards School</td>
<td>.10</td>
<td>.04</td>
<td>6.71</td>
<td>.01</td>
<td>1.11</td>
<td>1.03</td>
</tr>
<tr>
<td>Attitude towards Teachers</td>
<td>-.02</td>
<td>.02</td>
<td>1.41</td>
<td>.24</td>
<td>.9787</td>
<td>0.94</td>
</tr>
<tr>
<td>Academic Self-Efficacy</td>
<td>-.05</td>
<td>.03</td>
<td>3.07</td>
<td>.08</td>
<td>.947</td>
<td>0.89</td>
</tr>
<tr>
<td><strong>Social Self-Efficacy</strong></td>
<td>-.07</td>
<td>.03</td>
<td>7.31</td>
<td>.007</td>
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<td>1.02</td>
</tr>
<tr>
<td>Emotional Self-Efficacy</td>
<td>-.00</td>
<td>.02</td>
<td>0.001</td>
<td>.98</td>
<td>1.00</td>
<td>0.96</td>
</tr>
<tr>
<td>Denying Giftedness</td>
<td>.08</td>
<td>.04</td>
<td>4.35</td>
<td>.04</td>
<td>1.08</td>
<td>1.01</td>
</tr>
<tr>
<td>Humour</td>
<td>.02</td>
<td>.06</td>
<td>0.19</td>
<td>.67</td>
<td>1.02</td>
<td>0.92</td>
</tr>
<tr>
<td>School Type</td>
<td>-.86</td>
<td>.25</td>
<td>12.19</td>
<td>&lt;.001</td>
<td>2.35</td>
<td>1.46</td>
</tr>
<tr>
<td>Gender</td>
<td>-.98</td>
<td>.24</td>
<td>17.62</td>
<td>&lt;.001</td>
<td>2.71</td>
<td>1.70</td>
</tr>
</tbody>
</table>

Significant factors and variables have been highlighted in bold.

4.6.2. Logistic regression subsequent models
A further logistic regression analysis was conducted to re-estimate the model using only significant factors from the initial model. The model containing the six identified predictors, attitude towards school, motivation / self-regulation, gender, school type, social self-efficacy and denying giftedness, was statistically significant $\chi^2 (5, N = 596) = 66.14, p < .001$, indicating that the model with these six variables was able to distinguish between respondents identified as achieving and underachieving. With all six variables included, the model correctly classified 81.8% of the students as either gifted achievers or gifted underachievers and represents a variance of 11%-17% (representing a slight increase over the initial regression model). The model chi-square $\chi^2$ was 66.14 with 2 df. The Cox and Snell $R^2$ was .11. The Nagelkerke $R^2$ was .17, and the Hosmer and Lemeshow goodness of fit index was 11.01 with 8 df (p=.20). These results suggest that the six-factor model (see Table 4.5) was better at estimating group membership than the 12-factor model. In this model, five of the six factors (motivation/self-regulation, social self-efficacy, denying giftedness, gender and school type) were statistically significant predictors of group membership. Using the new model, the factor ‘attitudes toward school’ was no longer a significant predictor of achievement status ($p = .060$).
A subsequent logistic regression analysis, using these five significant factors (motivation/self-regulation, gender, school type, social self-efficacy and denying giftedness), found that these factors were better at predicting group membership than the six-factor model represented in Table 4.6. The model containing the five identified predictors was statistically significant $\chi^2(4, N = 596) = 52.28, p < .001$, indicating that the model with these five variables was better able to distinguish between respondents identified as achieving and underachieving, correctly categorising 81.8% of participants, with variance explained by this model of 11%-16%. With the model, chi-square $\chi^2$ was 62.28 with 2 df. The Cox and Snell R2 was .10. The Negelkerke R2 was .16, and the Hosmer and Lemeshow goodness of fit index was 11.21 with 8 df (p=.20).

In this final model (Table 4.7, below), the motivation/self-regulation factor predicted that, with each point of increase in motivation, the likelihood of the individual being a gifted achiever increased 6% across a 7-point Likert scale. Participants reporting that they deny their giftedness increased the likelihood of them being classified as an underachiever by 1.9 times.

### Table 4.6. Results of Logistic Regression Analysis with Six Predictor Variables

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S. E</th>
<th>Wald</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95% C.I. for odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>Lower</td>
<td>Upper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude towards School</td>
<td>-.06</td>
<td>.03</td>
<td>3.48</td>
<td>.060</td>
<td>1.64</td>
<td>1.0 - 1.14</td>
</tr>
<tr>
<td>Motivation/Self-Regulation</td>
<td>-.06</td>
<td>.01</td>
<td>23.61</td>
<td>&lt;.001</td>
<td>.95</td>
<td>.93 - .97</td>
</tr>
<tr>
<td>Gender</td>
<td>-.94</td>
<td>.23</td>
<td>17.20</td>
<td>&lt;.001</td>
<td>2.57</td>
<td>.25 - .97</td>
</tr>
<tr>
<td>School Type</td>
<td>-.85</td>
<td>.23</td>
<td>12.71</td>
<td>&lt;.001</td>
<td>2.33</td>
<td>.273 - .68</td>
</tr>
<tr>
<td>Social Self-Efficacy</td>
<td>-.05</td>
<td>.02</td>
<td>5.43</td>
<td>.020</td>
<td>1.05</td>
<td>1.01 - 1.10</td>
</tr>
<tr>
<td>Denying Giftedness</td>
<td>.09</td>
<td>.04</td>
<td>5.73</td>
<td>.020</td>
<td>1.09</td>
<td>1.02 - 1.17</td>
</tr>
</tbody>
</table>
times. Additionally, the logistic regression model suggested that an individual would be a gifted underachiever if their social self-efficacy was high. Further, on the dichotomous scale of gender, males were 2.5 times more likely to be underachievers than females according to this model. Likewise, in this study, students were 2.4 times more likely to be classified as underachievers in a fully selective context.

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95% CI for odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation/Self-Regulation</td>
<td>-.05</td>
<td>.01</td>
<td>20.73</td>
<td>&lt;.001</td>
<td>.953</td>
<td>.93 - .97</td>
</tr>
<tr>
<td>Gender</td>
<td>-.95</td>
<td>.23</td>
<td>17.51</td>
<td>&lt;.001</td>
<td>2.57</td>
<td>1.65 - 4.01</td>
</tr>
<tr>
<td>School Type</td>
<td>-.89</td>
<td>.24</td>
<td>14.24</td>
<td>&lt;.001</td>
<td>2.43</td>
<td>1.53 - 3.86</td>
</tr>
<tr>
<td>Social Self-Efficacy</td>
<td>.06</td>
<td>.02</td>
<td>7.26</td>
<td>.007</td>
<td>1.10</td>
<td>1.02 - 1.11</td>
</tr>
<tr>
<td>Denying Giftedness</td>
<td>.08</td>
<td>.04</td>
<td>5.14</td>
<td>.020</td>
<td>1.9</td>
<td>1.01 - 1.16</td>
</tr>
</tbody>
</table>

### 4.7. Determining the Accuracy of Predicting Underachievement: Receiver Operating Curve (ROC) Analysis

The use of Receiver Operating Curve (ROC) analysis is a statistical and theoretical way of transforming data into more direct answers to practical implementation questions in clinical and other settings (Youngstrom, 2014). ROC curve analysis is useful in determining the accuracy of predictions and assessing the usefulness of clinical or practical applications of these predictions (Gonen, 2003). It has been extended from use in signal analysis theory, in which ROC analysis is used to articulate the trade-off between accurate hit rates and false positives, to current use in illustrating and analysing the performance of medical diagnostic
systems (Swets, 1998). More recently, ROC analysis has been used in clinical psychology applications to assess the validity of diagnostic instruments to justify clinical decision-making (Pintea & Moldovan, 2009; Youngstrom, 2014). The medical research and diagnostic community has developed an extensive research body on ROC analysis for assessing the usefulness of diagnostic tests in identifying risk factors in related to survival rates for patients with particular diseases and for assessing the precision of a statistical model (e.g., logistic regression) that classifies subjects into one of two categories (e.g., living or dying, or, in this study, achieving or underachieving), thus informing researchers about the appropriateness of tests in a situation requiring intervention (Zou, O’Malley, & Mauri, 2007).

The ROC curve illustrates the ability of the classifiers (in this case, factors such as motivation/self-regulation or social self-efficacy on a survey instrument, or demographic variables such as gender) to rank the positive cases (e.g., achiever) versus the negative cases (e.g., underachiever) based on a score individuals report on the survey or their demographic situation. In this sense, ROC analysis provides an extension of logistic regression, in that it enables the researcher to identify the point at which survey score information may be useful in classifying an individual in order to make decisions about the need for intervention for particular risks such as underachievement, depression or medical diseases (Provost & Fawcett, 2001).

ROC analysis was used in this study to evaluate the point at which scores on the survey instruments’ predictor variables (e.g., motivation/self-regulation, social self-efficacy) would be useful for ‘diagnosing’, or predicting, levels of achievement. This is useful for the education community in that it can then be used to inform appropriate interventions for underachievers. Specifically, ROC analysis was run to assess the true positive rate (correct
identification of gifted achievers and underachievers) against false positive rate (incorrectly identifying an achiever as a likely underachiever or an underachiever as a likely achiever) at the different cut-points within each factor identified in the final logistic regression model (i.e., motivation/self-regulation, denying giftedness, social self-efficacy). Additionally, the dichotomous demographic variables identified by the logistic regression (gender and school type) were also analysed.

### 4.7.1. Determining the cut-point for each factor

In this study, each predictor variable was analysed for the point at which a score beyond an identified cut-point resulted in a satisfactory sensitivity (fewer individuals missed or more false positives) and specificity (more individuals missed or fewer false positives) outcomes. When determining the cut-point for each variable it is important to test the level of each variable in the model to identify the point at which the sensitivity and specificity of the score on the scale is useful in identifying if the individual is at risk. The identified cut-points were tested to identify the score on the scale at which the variable would be useful in correctly classifying the individual, in order to decide if intervention or support was necessary (Faraggio & Reiser, 2002). The cut-off value of 24 or below was identified for motivation/self-regulation as, on balance, it had good validity in predicting the outcome variables (achievement level). The sensitivity and specificity for this cut-off value were, respectively, 0.69 and 0.49 for predicting achievement level: the point at which the instrument had 68.8% sensitivity (true positive) and 49.6% specificity. The cut-off value of 28 or above was identified for social self-efficacy as, on balance, it had good validity in predicting the outcome variables (achievement level). The sensitivity and specificity for this
cut-off value were, respectively, 0.61 and 0.62 for predicting achievement level, the point at which the instrument has 61.9% sensitivity and 63.2% specificity. The cut-off value of 26 or above was identified for the denying giftedness factor, with the sensitivity and specificity being, respectively, .67 and .63, the point at which the instrument has 67% sensitivity and 63% specificity. For gender and school type it was not necessary to identify the cut-point as the variables are dichotomous.

4.7.2. Aligning the factors to the predicted outcome

The scores for each of the predictive five factors (motivation/self-regulation, social self-efficacy, denying giftedness, gender, and school type) were then converted or allocated (if the score was dichotomous – gender and school type) to a score of 1 or 0 to be entered into the ROC curve analysis which requires dichotomous variables. To ensure that the variables were entered into the model consistent with the directional relationship of the variable with achievement level, each variable was assigned to a score of 1 or 0. As such, motivation/self-regulation was assigned a 1 if the score was below the identified cut-point, as low motivation self/regulation is negatively correlated with achievers. To assess the performance of the factors and variables identified in the logistic regression as predictive factors for achievement level using the ROC curve analysis, each factor was transformed into a dichotomous value of 0 or 1, indicating its relationship to the diagnosis; that is, underachievement or achievement. The values represent the positive and negative likelihood ratio and are independent of achievement level, whilst positive and negative predictive values are highly dependent on probability of achievement level. As such, for the motivation self-regulation factor, scores over 24 on the motivation scale were assigned a value of 1
reflecting that scores of 24 and above were aligned with a participant being an achiever) and scores equal to, or below, 23.9 were assigned a value of 0 (as scores below this level were aligned with an individual being an underachiever). The same process was executed for the cut scores of 26 for denying giftedness, with students who reported scores of 26.1 and above (increasing use of denying giftedness) being assigned to the underachiever group and hence being assigned a 0, and scores below 26 being assigned a 1. Similarly, a cut point of 28 was used for the social self-efficacy factor, with scores below 27.9 (the lower the score indicating lower levels of social self-efficacy) being assigned a 1 to align scores over this number with the being an achiever and scores above 28.1 (the higher the score indicating higher levels of social self-efficacy) being assigned a 0 to align these scores to the underachievement classification. Gender was a variable that predicted achievement level, with being male increasing the risk of underachievement. As such, females were assigned a value of 1 (reflecting that they were more likely to be achievers in this model) and males were assigned a value of 0 (as being male increased the likelihood of underachievement). Similarly, to reflect the model, students attending a partly selective high school were assigned a value of 1 and a fully selective high school a value of 0 (as the logistic regression model predicted that attending a fully selective high school increased the risk being diagnosed as an underachiever). Each factor or variable that predicated underachievement was allocated a 0 to reflect the model, and 1 where the variable was more likely to predict achievement. This allocation ensured that the variables were consistent with the level of achievement denoted by the previous t-test and logistic regression analysis. In this study, sensitivity was favoured over accuracy, as it was believed that schools that may use such a process would be better
off identifying more false positives (achievers who look like underachievers on the survey) than missing true positives (underachievers).

### 4.7.3. ROC curve calculation and area under the curve representation

These factors were then analysed using a ROC curve. The area under the curve after analysing the combination of the five factors was found to be 0.67 (95% confidence interval: 0.61-0.72). Given that the area under the curve is significantly different from 0.50 ($p < .001$), this analysis indicated that the ROC analysis classified group membership significantly better than chance (see Figure 4.1). Results suggest that the model performs with motivation/self-regulation, social self-efficacy, gender and school type included and that the model is able to diagnose students at risk of underachievement.
Factors included gender, school type, denying giftedness, motivation/self-regulation and social self-efficacy, used to identify achievement level. The AUC is an effective and combined measure of sensitivity and specificity that describes validity of this survey as a diagnostic tool. The ROC curve (represented in blue) corresponds to discriminant capacity of a tool as a diagnostic test, and is located progressively closer to the upper left-hand corner in “ROC space”. The green line represents the likelihood that the result is based on chance.

The ROC curve suggested that for individuals for whom all five variables were above the cut-points, the model provided diagnostic information for educators regarding which gifted students would be achievers or underachievers with 70.6% accuracy. For individuals
for whom four of the identified variables were above cut-points, the model was 37.5% accurate at identifying gifted achievers and underachievers. The presence of five variables above cut-points thus provides strong prediction of achievement levels, although this accuracy of prediction drops when only four of the variables are above this threshold.

In summary, the ROC analysis indicated that this model will enable educators to identify students who are at risk of underachievement. This process will enable educators and schools to flag potential underachievement before students even enter a gifted context, by using the identified cut-point for each of the factors on the surveys in combination with the demographic information. This model suggests that these tools in combination are useful in diagnosing students who are vulnerable to underachievement, and provides the opportunity to screen for susceptibility to underachievement on entry to a gifted program or school that organises students into ability-grouped learning contexts. The use of this analysis is experimental and will need further validation to assess the veracity of its use within educational contexts.

4.8. Conclusions

The purpose of this chapter was to report and discuss the findings of this study, with reference to the identified research questions. Firstly, an evaluation of the psychometric properties of the chosen scales within the Australian gifted context, to examine the usefulness of these scales outside the original research settings, found that the School Attitude Assessment Survey-Revised (McCoach & Siegle, 2003b) was a reliable and valid instrument to use in this context and reflected the reliability and validity previously reported. The Self-Efficacy Questionnaire for Children was also found to be valid and reliable for use with this
sample and in the Australian context, and reflected the reliability and validity of this scale in previous applications. The Social Coping Questionnaire, however, was found to be less reliable and valid in the context of this investigation, with only two of the original seven factors in the scale able to be used due to validity and reliability issues. These findings suggest that the SAAS-R and the SEQC can be utilised within an Australian and ability-grouped context as originally designed by the authors. However, the Social Coping Questionnaire should be further examined and modified if it is to be used to assess all the factors identified by the original author in an Australian and/or ability-grouped context with gifted students.

The exploration of the relationship between the subscales and a comparison of these relationships between factors for achievers and underachievers found that there was strong correlation between a large number of the measured factors. The patterns found when examining the differences between factors indicated that achievers’ beliefs about the value of school were related to their attitudes to their teachers and schooling generally, whilst for underachievers this was not the case. Similarly, achievers’ beliefs about their own social competence were related to their perception about their relationship with teachers. Finally, an individual’s motivation and self-regulation is related to their use of negative social coping strategies in underachievers, but not in achievers. These differences may have implications for the identification and support of underachievers in schools.

An analysis of the relationship between achievement and gender, school type and grade level showed significant relationships between gender and achievement level, and between achievement level and school type, but not grade level. As such, when looking for
underachievement within a context like that of this study, grade level should not be used as a useful indicator for possible underachievement.

A comparison of differences between gifted achievers and underachievers on each reliable subscale of the adopted scales suggested that achievers were slightly more positive in their attitude toward school, that they had higher academic self-efficacy and that they used the negative social coping strategy of denying giftedness less than their underachieving peers. Results also indicated that achievers rated themselves more highly on the academic self-perception, attitude to teachers, goal valuation and motivation/self-regulation subscales. These findings suggest that there were noticeable differences between the attitudes and perceptions of achievers and underachievers, which may influence the way in which they engage and therefore achieve at school.

A logistic regression analysis of the factors contained in the survey instruments (motivation/self-regulation, academic perception, attitude to school, attitude to teachers, goal valuation, academic self-efficacy, social self-efficacy, emotional self-efficacy, denying giftedness and humour) and demographic variables (gender and school type) were evaluated with the analysis, providing a model in which four factors predicted group membership. Results found that a five-factor model (motivation/self-regulation, denying giftedness, social self-efficacy, gender and school type) was useful in predicting group membership (gifted achiever or underachiever); adding to our current understanding of factors that are useful to predict underachievement. Additionally, ROC analysis suggested that these factors may be useful as diagnostic tools for identifying underachievers, with students who report particular levels of the identified factors being more vulnerable to underachievement. Thus, identification of these factors may be useful in practically informing educators about which
students may need to be monitored and supported. Currently, educators can retrospectively connect associated factors to underachievers, recognising once they have been in the school system that they are underachieving. The ROC curve analysis may enable educators to be more proactive in their response, using the survey tools and demographic information to flag students who may be at risk of underachievement before they begin to show signs of underachievement through their academic performance. These results indicate that certain factors related to the attitudes and behaviours of underachievers are unique in a self-contained or selective school environment, and that it may be useful for educators to understand the differences between these groups, as well as to use this knowledge to identify gifted students at risk of underachievement.
Chapter 5. Discussion

5.1. Introduction

The purpose of this chapter is to present the results of and conclusions to the research questions investigated. This chapter is structured to synthesise, interpret and discuss the results. The first section summarises the high-level aims, results and significant findings of the study. The second section presents a detailed analysis of the key elements of this study. Finally, this chapter aims to contextualise the study within the body of research and provide explanations as to the findings.

5.2. Statement of Results and Preliminary Conclusions

The current study sought to examine differences between gifted achievers’ and underachievers’ attitude toward school, their beliefs about their capacity and self-efficacy, and their perceptions of the social coping strategies they use to navigate their world at school. In doing so, the study aimed to identify factors that may assist educators in identifying gifted underachievers, earlier and more effectively, in Australian gifted, ability-grouped, middle- and high-school contexts. To ensure appropriateness of the data collection instruments, the psychometric properties of the School Attitude Assessment Survey-Revised (SAAS-R (McCoach & Siegle, 2003b), the Self-Efficacy Questionnaire for Children (Muris, 2001) and the Social Coping Questionnaire (Swiatek & Dorr, 1998) were evaluated. The SAAS-R and the SEQC were found to be valid and reliable for the Australian gifted high school context.
in their current form, whilst the SCQ proved less reliable and required modification prior to interpretation.

Subsequent analyses sought to identify factors related to gifted students’ achievement and factors that differentiate achievers and underachievers. Results indicated that these groups were distinguished by differing attitude toward school (e.g., attitudes toward teachers), motivations (e.g., goal valuation, motivation/self-regulation), self-beliefs (e.g., academic self-perception, academic self-efficacy) and their use of social coping strategies (e.g., denying giftedness). Differences in achievement status were also found across genders (underachievement was more common among males) and school type (underachievement was more common in the fully selective gifted context than in the partly selective contexts).

Further, gifted achievers uniquely showed positive correlations for goal valuation with attitude toward teachers and school, as well as social self-efficacy and attitude toward teachers, suggesting that not only do achievers have more positive attitude toward school in general but that their personal academic goals align with their beliefs about whether their school is an appropriate place for them and whether their teachers are meeting their personal learning needs. This contrasts with the patterns in the gifted underachieving group, with the relationships between these factors being more negative, suggesting that underachievers’ perceptions about their academic goals do not align with their perceptions about the way that school and teachers met their learning needs. Further, social self-efficacy was correlated with attitude to teachers only amongst gifted achievers, suggesting that an achiever’s self-efficacy parallels their perception about their relationships with their teachers. For example, it may be that gifted achievers see their teachers more like peers. As such, when they are confident in these relationships, they perceive that their needs are being met because they can express
their ideas and communicate well. For underachievers, the results indicate that educators may be able to use the denying giftedness social coping strategy as an observable behaviour that is linked to underachievement, as the analysis indicated that underachievers’ denial of giftedness increased as their motivation and self-regulatory behaviours decreased. This suggests that underachievers in a gifted context may be very aware of the difference in their motivation levels compared with their peers, and that to minimise the stigma of not achieving that they challenge the notion of their own capacity. These results have important theoretical and practical implications for addressing underachievement within a selective or partly selective gifted context, which will be addressed in Chapter 6.

A subsequent regression analysis sought to identify the factors that best predicted group membership. Results indicated that five factors predicted underachievement in the current sample: motivation/self-regulation, denying giftedness, social self-efficacy, gender and school type. To further identify the extent to which these factors could be used to identify/diagnose those at risk of underachievement, ROC analysis was conducted. Results indicated that a five-factor model was useful in diagnosing individuals who may be at risk of underachievement by utilising the demographic factors of gender and school type in conjunction with an individual’s scores on the motivation/self-regulation, social self-efficacy and denying giftedness scales of the instrument. These results suggest the potential for using early knowledge of these factors to proactively detect those at risk of underachieving, shifting the emphasis to prevention of underachievement rather than reactive intervention. A reconciliation of these insights with existing theory and research is discussed in the following sections. Suggestions of their implications and applications is discussed in Chapter 6.
5.3. Psychometric Evaluation Results

As a preliminary analysis, this study provided an independent investigation of the psychometric properties of the SAAS-R, SEQC and SCQ with an Australian gifted high school sample. This evaluation was important given the absence of research using these tools in an Australian and ability-grouped schooling context, enabling researchers to assess the usefulness of these instruments in this new context as well as increasing our understanding of the applicability of the scales across differing educational settings. Whereas previous research has demonstrated the content validity and reliability of the SAAS-R and the SCQ (in American schools in which the structure of the gifted program was not clearly articulated) and the SEQC (within what was defined as regular high schools) (Dai et al., 2013; McCoach, 2002; McCoach & Siegle, 2003b; Muris, 2001; Rudasill, Foust, & Callahan, 2007b; Swiatek, 2001; Swiatek & Cross, 2007), current results partly deviated from this prior evidence. Psychometric evaluation of the scales in the current study indicated that two of the scales, the SAAS-R and SEQC, were valid and reliable for use in the Australian gifted context.

The SCQ, however, did not show the same factor structure or level of reliability that has previously been published (Swiatek, 1995, 2001; Swiatek & Cross, 2007). Specifically, although the current results provided support for the proposed 7-factor structure of the SCQ (Swiatek, 1995; Swiatek & Cross, 2007; Swiatek & Dorr, 1998), an acceptable level of reliability was found for only two of the seven factors (denying giftedness and humour). A potential explanation for this disparity with previous results is the differences in study samples. Whereas previous research has evaluated this scale in American gifted contexts, the current scale was employed in the Australian gifted context. Differences in the methods of gifted identification in America and Australia (Swiatek, 2001), for example, may have
produced samples of different constitution. For example, Swiatek’s (2001) research indicated that the students in her sample were identified using different approaches with the aim to reflect the varying nature of gifted programs. Conversely, in this study the students were identified using the same process and instruments which measured the same sort of ability, enhancing the consistency of the type of giftedness identified and the type of program in which the participants were placed. Alternatively, instability across the factors may have contributed to the lower reliability in the current study. This is at least suggested by previous studies that have found alternate factor structures for the scale across age and gender (e.g., Rudasill & Callahan, 2007) and cultures (Chan, 2003a, 2003b, 2004, 2005).

Despite the potentially problematic nature of this scale in contexts outside that in which it was developed, it remains the only known instrument designed to measure social coping strategies in gifted students. Nevertheless, the current examination of this instrument suggests the need for its revision to be reliable within an Australian gifted context. This may include investigating whether phrasing has different cultural connotations for Australian students or whether the items that were removed due to low reliability affected the usefulness of the excluded factors. We know that culture impacts values and the perceptions of education (Flynn, 2015); however, there are few, if any, studies that directly compare Australian students’ attitudes to academic achievements with those of other countries; rather, most research compares cultural differences within Australia (Martin, Collie, Mok, & McInerney, 2016) or Australian participants are included within a larger cohort of ‘western’ countries (Marsh et al., 2015), with findings for the Australian cohort being subsumed into the general findings. There are studies into differences in beliefs between Confucian and European cultures (Morony, Kleitman, Lee, & Stankov, 2013) but these do not include Australia.
Applications of the SCQ in Hong Kong produced different results to application in an American context, suggesting that cultural considerations may be appropriate to explain some of the differences in this study; however, there are, to date, no findings for an Australian cohort.

However, beyond the question of cultural influences, is the reliability of the survey itself and whether the structure and phrasing may contribute to the varying degrees of consistency across studies utilising this questionnaire. The survey has lower reliability with elementary/primary school children than with middle school and high school students, particularly on the scales measuring humour, hiding giftedness and helping others (Rudasill, Foust, & Callahan, 2007a) When examining the factors, the denying giftedness factor is the most robust factor, consistently scoring Cronbach alpha scores with the middle school and high school age group ranging from .72–.83 (Chan, 2003a, 2004, 2005; Swiatek, 1995, 2001; Swiatek & Dorr, 1998), with the lowest result being for elementary school students (Swiatek, 2002). The factors which were less robust in this study (helping others, conformity to mask giftedness, minimizing popularity) reflect similar inconsistencies found in some studies (Swiatek, 2001, 2002). However, in other research these factors were found to have good reliability (Chan, 2003a, 2004, 2005), suggesting that perhaps culture may be an influence on the reliability of the instrument.

Additionally, the level set for acceptability in this study was higher than the level set in previous studies, and this may also have impacted on the assessment of the instrument’s usefulness (Swiatek & Cross, 2007). As such, this needs further investigation to establish whether the instrument has enough internal and external consistency for use.
Investigating whether the ability-grouped context influenced the way in which the items were interpreted may be important in understanding the different findings in this study: students who are in a context with gifted peers possibly saw high activity of helping others or being popular with their gifted peers as typical behaviour, and therefore viewed the items within their own context. These perceptions may be different to what may be seen as ‘normal’ social expectations in mixed ability schooling environments. Evaluation of the true reasons for the inconsistencies in this survey may involve a number of approaches, including:

- Comparing results from a mixed ability context and ability-grouped context to assess whether indeed students respond differently in varying educational contexts;
- Rephrasing items which load onto two factors to focus on one to assess the validity of the items;
- Condensing factors where the names of factors overlap (such as denying negative impact of peer acceptance and minimising focus on popularity) to increase the power of the factor being measured and reduce factorial overlap; and
- Comparing Australian and other cultural cohorts to assess the usefulness of the survey cross-culturally.

These suggestions would aim to assess whether the Australian context truly makes a difference or whether the instrument needs modification and revalidation.

It is important to view the inconsistency of the SCQ when compared with the SEQC and the SAAS-R in that these surveys reported strong reliability and validity within the Australian gifted context. This suggests that the surveys are not influenced by cultural or schooling contexts, whilst the SCQ seems to be vulnerable to different contextual elements such as age, culture and grouping. As such, results from the SCQ should be viewed with
caution and it is recommended that the questionnaire be further assessed to confirm the usefulness of the instrument or highlight the need for significant adjustments for different contexts.

5.3.1. Differences and relationships between extracted factors in achievement level

Using the reliable subscales identified via psychometric evaluation, this study found differences between the attitudes, beliefs and perceptions of gifted achievers and underachievers.

These included:

- Academic self-perception
- Attitude toward teachers
- Goal valuation
- Academic self-efficacy
- Motivation/self-regulation
- Denying giftedness

The current study found underachievers to have lower academic self-perception than achievers. While this result is similar to previous findings of lower academic self-perceptions amongst gifted underachievers (Ritchotte et al., 2014; Snyder & Linnenbrink-Garcia, 2013; Tirri & Nokelainen, 2011), it is by no means a consistent one (McCoach & Siegle, 2003a, 2003b, 2003c, 2012). These differences may result from differences in sample composition, with some research being done with participants from mixed-ability general education
programs, other research being drawn from residential gifted programs, and a mixture of both general education and ability-grouped situations; by contrast, the participants in this study were sourced solely from ability-grouped gifted contexts in Australia. In the McCoach study (2003) of gifted students, achievers and underachievers having equally high perceptions of their abilities was interpreted as being a result of both groups knowing that they are capable of performing well at school. By contrast, the Suldo (2008) study found underachievers to have more negative academic self-perceptions, with the results interpreted as being a consequence of experiences with school-based feedback. The difference in the attribution of the high or low academic self-perception between these studies may be a result of context, with the Suldo study drawing participants from a single rural high school, whilst the McCoach study drew participants from 28 different schools. As such, the Suldo results may reflect the school rather than a broader gifted population. Differences in the academic self-perception of gifted achievers and underachievers in this study therefore may also be the result of different contextual influences, including the study being an Australian context in which it is less culturally acceptable to be proud of your abilities (Feather, 1989); it may also be the result of these students being in an ability-grouped context, which may extend on Suldo et al.’s (2008) findings where half the students were Advanced Placement (AP) or International Baccalaureate (IB) candidates, and, as such, were grouped with other identified and highly able students. Results from this study suggest that grouping gifted students together does not make them arrogant or overconfident, in line with previous research (Cheung & Rudowicz, 2003; Feldhusen & Sayler, 1990; Fiedler et al., 2002; Geake & Gross, 2008; Matthews & Kitchen, 2007), nor does it mean that they will see the identification of their abilities as necessarily accurate.
This finding supports assertions that ability grouping impacts academic self-perception through the social comparison theory framework, with the academic self-perception of students from grouped and streamed environments being lower when they compare themselves with high achievers in their context (Craven et al., 2000; Green et al., 2012; Marsh et al., 2007). However, results in other studies suggest that this is too simplistic an explanation for difference in academic self-perceptions among identified gifted students (Dai & Rinn, 2008; Gross, 1997; Rollins & Cross, 2014) and that these differences may lie in the psychological make-up of gifted underachievers, who perhaps may be underachieving in response to other aspects of their situation. Whilst this difference is significant in the current study, academic self-perception was not identified as a predictor variable, nor did it correlate differently with other factors for achievers and underachievers. This finding suggests that these students do feel academically less able than their peers in an ability-grouped context; however, other factors may be more significant in identifying and supporting underachievers.

In this study, differences in academic self-efficacy were between gifted achievers and underachievers. Gifted achievers reported more positive academic self-efficacy than underachievers, but no significant difference in their social or emotional self-efficacy. This finding supports previous research suggesting that gifted achievers have higher academic self-efficacy than underachievers and that achievement is correlated with academic self-efficacy (Pajares, 1996a; Pajares, Britner, & Valiante, 2000; Pajares & Graham, 1999; Pajares & Schunk, 2001b).

Differences were found in the use of social coping strategies between achievers and underachievers in this study with underachievers being more likely to report use of the social
coping strategy of denying their giftedness than their achieving peers. Despite some contextual differences in this study, compared with previous research (Swiatek, 1995, 2001, 2002; Swiatek & Cross, 2007; Swiatek & Dorr, 1998) that examined social coping amongst gifted students in a both a gifted and mixed-ability context, the results support the findings that negative stressors (visible underachievement in an academically selective environment) tend to increase the use of negative social coping strategies such as denying giftedness (Swiatek, 1995, 2001). For students in an ability-grouped context, the negative stressor may be the visible underperformance compared with their peers, whereby in order to minimise the effect of this underperformance, denying that they are gifted may be a useful strategy to deflect potential ridicule. This finding may provide further insights into gifted underachievers’ perceptions of themselves within ability-grouped environments, with students who are not achieving as well as their peers either believing that they are not gifted or that they must at least deny this perception of themselves.

In contrast to these differences between gifted achievers and underachievers, attitude to school surprisingly did not differ between the groups. This contradicted expectations, which were based on the common finding that underachievers have significantly more negative attitude toward school than achievers (McCoach & Siegle, 2001, 2003a, 2003b, 2012; Ritchotte et al., 2014). That the current study’s participants were recruited from an ability-grouped gifted class or selective school environment may account for this difference in findings. That is, in previous studies a sample was drawn from a broad range of schools (McCoach & Siegle, 2003a) and from a rural American context with a range of ability grouping structures (Suldo et al., 2008). These contexts may influence the attitudes these students hold about school as the participants may be in general educational contexts in which
they may perceive that their school is not a good match for them; by contrast, the participants in the present study were placed in contexts where they are more likely to perceive that the school is a good match in that they are ability-grouped. This finding may suggest that differences in attitude toward school for gifted students may relate to their perception about the appropriateness of the way in which schools organise them for their learning experiences.

5.3.2. Patterns of factor relationships between achievers and underachievers

Different patterns of correlations between extracted factors were found for gifted achievers and underachievers in this study. The results were that no significant differences were found for the relationship between factors. However, there were significant differences between achievers and underachievers in the relationships between the participants’ attitude toward teachers and social self-efficacy; goal valuation and attitude to teachers; goal valuation and attitude to school; motivation/self-regulation and denying giftedness; and academic self-efficacy and denying giftedness.

The pattern of relationships suggests that understanding the connection between goal valuation and attitude toward school may be useful in better understanding the nature of gifted underachievement within a self-contained or selective environment. This difference may suggest that whether students believe that school is important in their lives and for future goals is associated to their attitude to school, supporting the multicollinearity previously reported (Matthews & McBee, 2007; McCoach & Siegle, 2003a). Despite the multicollinearity, the correlations between all factors were investigated, and, in this study, only some relationships were identified as significant, suggesting that the relationship here
is unique for underachievers in this context. This relationship has important implications for underachievers, as they have more negative attitude toward school and their teachers and value school goals less than their achieving counterparts. These results suggest that achievers’ attitude toward school aligns more closely with their personal perceptions about the relevance of school to their goals, whereas this is not the case for underachievers. For underachievers, even if they do value the goals of schooling generally, this does not impact on their attitude to school and teachers. Consequently, underachievers may engage less purposefully in learning experiences due to the perception that school itself is not a good match for them, reflecting the research that environment is an influential factor in underachievement in gifted individuals (Baker et al., 1998; Balduf, 2009; Landis & Reschly, 2013; Matthews & McBee, 2007; Rayneri, Gerber, & Wiley, 2006; Ritchotte et al., 2014; Siegle & McCoach, 2009; Smith, 2005, 2010). If schools can focus on improving the goal valuation of students rather than the individuals’ attitude toward school, then this may reduce underachievement.

Goal valuation was also found to be significantly related to attitude to teachers in this study, with the relationship for achievers being more positive. The relationship between these factors suggests that the value of school goals combined with beliefs regarding teacher care and competence may impact on performance. Students who believe their teachers construct learning appropriate to their needs value the goals of school more highly. This supports previous research suggesting that underachievers see their performance as related to their learning environment (Baker et al., 1998; Balduf, 2009; Landis & Reschly, 2013; Matthews & McBee, 2007; Rayneri et al., 2006; Ritchotte et al., 2014; Siegle & McCoach, 2009; Smith, 2005, 2010), which is shaped actively by teachers and their approach to teaching and
learning. Research has found that task meaningfulness and environment are powerful factors in driving motivational behaviours (Ritchotte et al., 2014), and, as teachers are mainly the designers of tasks that students are required to complete, this finding supports the concepts in Ritchotte et al.’s (2014) research. Results from this study support the findings of Ritchotte et al. ’s (2014) study that environment and task meaningfulness affect achievement, since how students feel about the school environment and their teachers shapes their view about the usefulness of school (goal valuation). In light of this interpretation of the findings, schools may need to examine the way in which teachers engage with gifted students in their classrooms to improve student perceptions, such as school’s relevance to the underachievers’ lives. However, specifically addressing the goal valuation of students may be more appropriate, as this factor is only related to improvements in attitudes for students whose perceptions of the goals of school align with their personal perspective. So, whilst teacher relationships are vital to student success generally, individuals are more likely to value what teachers provide if the learning aligns to their perceptions about how these experiences will contribute to their success in the future.

The importance of goal valuation is further emphasised through its relationship to two other factors for achievers, suggesting that it is important to gifted students’ attitudes about school’s suitability and perception of teacher quality. When students perceive that school achievement will help them be successful in the future, they are more likely to perceive that their school context and that their teachers are meeting their needs more effectively.

In this study, motivation/self-regulation was found to be related to the social coping strategy of denying giftedness for gifted underachievers. Gifted underachievers who had significantly lower motivation/self-regulation levels were more likely to use denying
giftedness as a social coping strategy within a self-contained gifted or selective school environment. This finding seems to be the first of its kind, as this study uniquely investigated the relationship of attitude toward school, self-efficacy and social coping in gifted achievers and underachievers. Results suggest that denying giftedness could be a useful indicator of underachievement of students within a gifted schooling context. This also suggests that students whose underachievement results from low self-regulation use denying giftedness as a strategy to cope with the dissonance of the school context and their perception about their ability. As such, schools may be able to use this as an indicator of students who will underachieve. Motivation/self-regulation has long been connected to achievement level (Baker et al., 1998; Colangelo et al., 2004; Matthews & McBe, 2007; McCoach, 2002; McCoach & Reis, 2000; McCoach & Siegle, 2003a, 2003b, 2005; Ritchotte et al., 2014; Siegle & McCoach, 2009). Explanations from previous research for this relationship may be related to the environment, as students who underachieve and find it difficult to self-regulate and be motivated at school, stand out in a self-contained gifted or selective environment more readily than in a mixed-ability context. Perhaps as a response to the Big Fish Little Pond effect (Green et al., 2012; Marsh & Seaton, 2013; Marsh et al., 2008; Marsh et al., 2005; Rinn, Reynolds, & McQueen, 2011), Schunk’s social comparison theory may be a useful explanation, as he suggests that individuals benchmark themselves against others to measure their own capacity. As a consequence, students who find it difficult to manage their motivation and self-regulatory approaches relate this to lack of ability or use it as an explanation to others, rather than connecting their performance to their effort (Yeager & Dweck, 2012). This use of the negative social coping strategy within an ability-grouped context may be related to the negative stressors found to precipitate underachievement, as
suggested in previous research (Swiatek, 2001). In an academically selective environment, the visibility of such an achievement difference may affect students’ perceptions of their ability and make them more likely to blame their lack of achievement on a lack of ability. The social coping behaviour may be a good indicator of students who may benefit from support developing motivation/self-regulation strategies as well as approaches based on achieving one’s ‘personal best’, rather than using the success of others as the benchmark for capacity.

The relationship between social self-efficacy and other factors within the context of achievement level for gifted students is one that has not previously been the focus of much research, with most research focusing on academic self-efficacy in gifted achievers and underachievers (Ritchotte et al., 2014). Other research has focused upon attitude toward teachers and differences between achievers and underachievers (McCoach & Siegle, 2003a, 2003b, 2005, 2012; Rubenstein, Siegle, Reis, McCoach, & Burton, 2012b; Siegle & McCoach, 2009), however, to date, no research has examined the relationships among achievement level, social self-efficacy and other attitudes toward school. A significant difference was found between social self-efficacy and attitude toward teachers, with underachievers having more negative attitude toward teachers even if they had stronger social self-efficacy, unlike achievers, whose social self-efficacy was positively related to their attitude toward teachers. This finding suggests that underachieving individuals with strong social self-efficacy are less likely to rate their teachers highly than their achieving counterparts. This may be a result of underachievers being more confident to relate to their peers, and, as such, not needing to rely on the development of positive relationships with their teachers for social feedback. It may well suggest that gifted underachievers rely more
on the connections they have with their peers than their teachers, due to the perception that their teachers do not care about them, adjust their teaching appropriately or give them positive feedback, thus reducing reliance on positive social feedback from teachers. This may reflect findings in previous research that achieving gifted students often rate their teacher and the way their teachers engage with them as key to their motivation (Siegle et al., 2014) and focus on their peers, which in a selective or gifted context is full of intellectual peers who they may perceive will accept them (Adams-Byers et al., 2004a). This finding may relate to Betts and Neihart’s (2009) work, identifying different types of gifted underachievers, particularly the creative/challenging underachiever profile. This underachiever profile describes a student who perceives authority figures, and in particular, teachers, as adversaries rather than supportive adults, meaning that these students will have negative attitudes towards their teachers. If underachievement is linked to a student’s reliance on their peers for connections and negative attitude toward teachers, or, in a more extreme view, in which teachers are adversaries rather than supportive adults, then a focus on approaches to relational pedagogy for gifted students could help underachievers in a self-contained gifted context. Improving underachiever perceptions about teachers through positive relationships may improve trust and thus levels of engagement in learning.

**5.3.3. Demographic factors related to underachievement**

In line with research suggesting that gender, school context and year group influence achievement levels, it was hypothesised that gifted males would be more likely to underachieve than gifted females (Baker et al., 1998; Matthews & McBee, 2007; McCoach
& Siegle, 2012; Peterson & Colangelo, 1996; Smith, 2010). Additionally, it was also hypothesised that students attending fully selective schools would be less likely to underachieve than those in partly selective high schools, based on research suggesting that ability grouping increases performance (Rogers, 2007) and that fully selective high schools outperform their partly selective counterparts in NSW (Better Education, 2015). Another hypothesis proposed was that students in years 8 and 9 would be more likely to underachieve than students in year 7, as data suggests that achievement tends to reduce during those years (OECD, 2014).

Interestingly, students in this study who were in a fully selective environment were more likely to be identified as underachieving than students in a partly selective school. This result does not reflect expected outcomes for students from these different schools, with entry cut off scores for students from fully selective high schools being higher than those entering partly selective high schools. As such, it would be reasonable to expect that students in fully selective environments should achieve better than those in partly selective environments (Better Education, 2015). These results may suggest that there are indeed more underachievers within a fully selective school context; alternatively, it may reflect the context in that teachers’ judgements of performance, grading and level of curriculum in a fully selective environment may be more rigorous than partly selective contexts. As such, students in a fully selective environment would be more likely to look like they are underachieving, given the more academically rigorous setting. Furthermore, teachers within a fully selective context do not have typical learners with whom they can compare the performance of gifted students, and thus may judge the performance of the gifted students in their context on the basis of the gifted cohort rather than across a more typically representative cohort.
Alternatively, students within a fully selective context who are not accustomed to a competitive, self-contained gifted learning context may underperform in such a context, as they have no typical learners with whom they can benchmark their performance and may suffer from the big-fish-little-pond effect (Craven et al., 2000; Marsh et al., 2008; Marsh et al., 2005; Rinn et al., 2011) in which they suffer from not being the brightest in a selective learning environment. Alternatively, these underachievers may be the students identified in Gross’ (1997) research, in which students in a selective environment who are ego-involved, and measure their success comparatively with other students, find adjusting to the context more difficult than those who are task involved and focused on learning itself (Dweck, 1999; Gross, 1997). These students may have the ‘fixed mindset’ approach to success described by Dweck, in which students who see that their success is based on their abilities are inflexible and less successful than those who see their capacity as flexible and based on their effort and hard work (Yeager & Dweck, 2012). This focus on comparative achievement may reduce their motivation, self-efficacy and other factors that contribute to underachievement more strongly in such an environment. On the other hand, gifted underachievers within the selective context may be ‘selective consumers’ (Delisle & Galbraith, 2002; Figg et al., 2012); that is, a group of underachievers who believe that they are capable of achieving well but are not engaged and are selectively consuming what is offered at school. The finding that students in this study who were in a fully selective environment were more likely to be identified as underachieving than students in a partly selective school warrants more investigation to unpack the reasons and to assess whether it is specific to this school and group of participants or reflective of fully selective high schools generally.
Gender was found to be a significant factor in underachievement in this study, with males being more than twice as likely as females to be identified as underachievers, supporting previous research (Baker et al., 1998; Heacox, 1991; Hébert, 2001; Hébert & Schreiber, 2010; Kerr & Cohn, 2001; Matthews & McBee, 2007; McCoach & Siegle, 2003a, 2012; Peterson, 2000; Smith, 2010). This finding reflects current trends in Australia at the point of matriculation, in which Australian females are significantly outperforming their male counterparts in the HSC (Ireland, 2015). There are a number of theories that researchers propound to explain the reasons for this underachievement in males, including the perception of the relevance of school and the prevalence of female teachers as role models for learning, or the reported “feminisation” of school-based learning (Carrington & McPhee, 2008; Monceaux & Jewell, 2007; Watson, Kehler, & Martino, 2010). Additionally, research has suggested that girls are more anxious about performance than boys, and as such, academic achievement at school may not be as important to boys, leading to increased likelihood of underachievement (Altermatt, 2007). Research has found consistent results when examining gender as a factor in underachievement in gifted students, with males more likely to underachieve than females (Carrington & McPhee, 2008; Monceaux & Jewell, 2007; Smith, 2010; Watson et al., 2010). However, females were more likely to deny their giftedness than males if they were underachievers, and males were more likely to minimise their visibility through humour, according to some research (Swiatek, 2001, 2002; Swiatek & Cross, 2007). This study may not have identified gifted students whose underachievement is described by Betts and Neihart (2009) as being the ‘successful’ underachiever, an underachiever whose underachievement is driven by the intense desire to please the adults in their world, and achieve good results at school but do not take academic risks (Betts & Neihart, 1988, 2009).
In their profile, girls are more likely to fall into this ‘successful’ underachievers category, and because this study set the underachievement benchmark as achieving grade ‘C’ or below, ‘successful’ underachievers would not have been identified as such, reducing the number of girls who perhaps should have been identified as underachievers. These findings regarding males and achievement seem to reflect international findings with regards to boys’ achievement generally and gifted boys specifically. The phenomenon may not be a specifically gifted underachiever issue, but may reflect a wider socio-cultural phenomenon (Organisation for Economic Cooperation and Development, 2015). In our current educational climate, it is worth schools investigating the specific reasons behind the underachievement of gifted boys, even in an ability-grouped learning context, to understand how they can better engage gifted boys and provide the support boys need to redress this underachievement.

In this study, grade was not found to be a factor related to underachievement, a finding which does not reflect the literature on the reduced engagement of learners as they progress through the middle school and high school years (Angus et al., 2010; Balfanz et al., 2007; Green et al., 2012; Lepper et al., 2005). This finding suggests that underachievement in this cohort is not related to challenges faced in the middle years such as, the onset of puberty or other general adolescent concerns and that perhaps the factors underpinning underachievement may be already affecting the students when they enter grade 7. This assertion reflects the findings of one study which suggests that attitudes in pre-school and primary school can be correlated with underachievement in middle school and high school (Zabloski & Milacci, 2012). Students may be doubting their ability or they may already have lower motivation/self-regulation than achieving gifted students, before they enter the programs reflected in this study. As such these school contexts may not be creating the doubt
and denial of giftedness reported by underachieving students doubting their ability nor their lack of motivation/self-regulation, but may confirm or exacerbate what these students already believe about themselves. Further research is needed to better understand when the factors related to underachievement become evident in these gifted underachievers and the contexts which create these beliefs and attitudes.

5.3.4. Predictor variables for achievement level

This study aimed to investigate the extent to which demographic factors, social coping, school attitudes and self-efficacy predict students’ (under)achievement. In line with research suggesting that underachievers differ from achievers (Matthews & McBee, 2007; McCoach & Reis, 2000; McCoach & Siegle, 2003a, 2005, 2012), it was hypothesised that factors in the survey instruments and demographic factors, particularly motivation/self-regulation and goal valuation, would be able to adequately predict achievement or underachievement.

Results suggest that the factors useful for predicting achievement levels include motivation/self-regulation, denying giftedness, social self-efficacy and the demographic variables of school type and gender. The results were similar to those of McCoach and Siegle (2003a) who identified motivation/self-regulation as a predictor of achievement level; however, unlike the McCoach and Siegle study (2003a), goal valuation did not emerge as a predictor variable in this study. Whilst results indicated that there were differences between achievers and underachievers in their level of goal valuation (with underachievers valuing school less than their achieving counterparts), analysis suggested that goal valuation may not be a useful measure for predicting whether students are likely to be underachievers in a
selective or self-contained gifted context. This difference may be the result of the increased number of factors that were analysed in this study, with the addition of three self-efficacy factors, demographic factors of gender and school type, as well as two social coping factors. It may also reflect differences in the samples, as in this study the research was undertaken with gifted students in an ability-grouped context (students were in a gifted class or selective school environment) while McCoach and Siegle’s research occurred across more varied school contexts. Being with other students who value school and coming from home environments that value education (this can be inferred as the application process for such programs involves parents and guardians; additionally, students from six of the eight sites came from middle class backgrounds, according to demographic data, and only two groups came from lower socioeconomic contexts) may reduce the importance of goal valuation in predicting level of achievement, and as such suggests that there are differences in student attitudes as to whether achieving at school is important when compared with participants in other samples. As such, goal valuation may not be as significant precursor to motivation in gifted students in gifted contexts, as suggested by previous research (McCoach & Siegle, 2003a). This study suggests that the driver behind the academic underachievement of underachievers in this context may be the students’ difficulty in developing or mastering the self-regulation element of motivation. Therefore, this study suggests that valuing academic achievement as important for the future does not ensure that gifted students in an ability grouped context achieve well and as such addressing other factors such as motivation/self-regulation may be more effective in redressing underachievement in this population. Despite students possibly seeing academic achievement at school as important, this belief does not seem to mitigate challenges that underachievers in this sample seem to have with
motivation/self-regulation, and as such the motivation/self-regulation factor was found to be a useful predictor in this school context.

Similarly, the factor of denying giftedness was identified as a predictor variable in this study, whereby a student who has been identified as underachieving is more likely to report the use of denying giftedness as a social coping mechanism than is a student identified as achieving. This finding supports previous research that suggested that underachievers are more likely to use this as a strategy than achievers; however, its value as a predictor of underachievement has not been previously assessed (Swiatek, 1995, 2001). Further, it contributes to the body of research, in that this finding is specifically for students in an Australian self-contained gifted context. It was hypothesised that being in a self-contained gifted context might reduce the negative social coping mechanisms used by gifted underachievers, as they should not need to blend in socially, reflecting research that gifted students are less likely to disguise themselves when grouped together (Gross, 1997; Gross, 2006; Rogers, 2001). However, this was not the case in this study, suggesting that gifted underachievers seemed to feel the need to deny giftedness. This may be in part due to their lower achievement compared to their peers, reflecting findings from social comparison theories which suggest that self-regulation, self-efficacy and achievement are heavily influenced by individuals’ comparison of themselves with others in their context (Schunk, 1983; Wigfield et al., 2008).

This study also investigated self-efficacy variables of academic, social and emotional self-efficacy, as well as social coping strategies. Results indicate that only social self-efficacy is a predictor variable in this context, with high social self-efficacy being a predictor variable for underachievement. This was an unexpected finding, as social self-efficacy was not a
variable that previous research had associated with the level of achievement of gifted students, additionally this factor had not been found in this study to be a factor which distinguished between achievers and underachievers. One explanation for social self-efficacy being a predictor variable may be the result of underachieving students being able to navigate the social world of their ability-grouped context more proficiently, and as such this social confidence provides positive experiences rather than a reliance on high achievement to satisfy their need for positive feedback. This finding casts a new light on the relationship between social context and achievement level. It also supports the theoretical framework of social cognitive theory for this research, as it suggests that social context may influence perceptions about the importance of achievement. Interestingly, academic self-efficacy was not a predictor variable in this study, a finding that defies the logic derived from findings in previous research that academic self-efficacy would be influential on achievement level (Martin & Steinbeck, 2017; Pajares, 1996a; Pajares & Graham, 1999; Pajares & Schunk, 2001b; Vuong et al., 2010). This would suggest that achievement level is not purely a response to a participant’s confidence in their academic ability. It may be the result of students already believing that they are academically capable because they have been officially recognised as academically gifted for entry into their school or class (Figg et al., 2012; Peters, 2012b).

Importantly, in this study, gender is a strong predictor of group membership, with males being significantly more likely to be underachievers than females. This supports much of the research about boys of this age and also supports the broad research on males and their performance compared with females in this age group (Organisation for Economic Cooperation and Development, 2015; Smith, 2010), as well as that conducted specifically
with gifted boys (Baker et al., 1998; Colangelo et al., 2004; Heacox, 1991; Hébert, 2001; Hébert & Schreiber, 2010; Kerr & Cohn, 2001; Matthews & McBee, 2007; Peterson, 2000). These results support researchers who concluded that males were more likely to underachieve than females in the school context (Colangelo et al., 2004; McCoach & Siegle, 2003a). The significantly higher proportion of males who are predicted to be underachievers in this study may reflect the current trend of girls outperforming boys across the board (Ireland, 2015; Organisation for Economic Cooperation and Development, 2015) or may reflect the perceived ‘feminisation’ of the curriculum (Skelton, 2002; Weaver-Hightower, 2003), the reduced number of male role models in many schools (Skelton, 2002; Weaver-Hightower, 2003) or the perceived lack of relevance of school to boys (Lam et al., 2012). Teacher perceptions of gifted boys and girls may also play a part in the identification of underachievement, reflecting research showing that teachers perceive gifted girls to be working harder than gifted boys (Siegle & Reis, 1998). This difference is worth noting, with gender being a significant predictor variable of underachievement in this study with more males being identified as underachieving than females. The reasons for this variance need to be unpacked to better explain this difference; that is, whether this difference is socio-cultural, related to curriculum, related to attitudes to the relevance of school, or is specific to this context.

Unexpectedly, attending a fully selective high school was also a significant predictor variable of underachievement in this study. This may be the result of actual differences in levels of underachievement within a fully selective versus partly selective environment, whereby students in the fully selective environment are more vulnerable to underachievement. Alternatively, the difference may be linked to students’ perceptions about
their capacity, based on the comparisons they make within the grouped context. As there are no typical learners with which to compare themselves, individuals who are ego-involved or suffer from big-fish-little-pond effect may struggle with the extent of competition in a fully selective context and not being the best in this environment (Braten & Olaussen, 2005; Craven et al., 2000; Green et al., 2012; Marsh & Seaton, 2013; Marsh et al., 2008; Marsh et al., 2005; Rinn et al., 2011). If this is the case, then it may be worth addressing the resilience and perception of students who enter fully selective environments, in order to provide support for those who struggle with others outperforming them. Alternatively, this may reflect the more academically rigorous environment, creating higher expectations from teachers who then expect more from their students in assessments. This may mean that the number of students identified in the fully selective high school may not be seen as underachievers in a different context, as the level of achievement may be lower in a partly selective or mixed-ability school. This finding may have important implications for teachers and academically selective environments, in terms of identifying what true underachievement means and whether the results achieved and reported in fully selective environments are reflective of core (expected) or extension level (beyond expected) learning. Additionally, these results may reflect that these students are underachieving based on their capacity, which should be beyond that of more typical learners. This result is worth investigating further to identify whether this phenomenon is specific to the current study or whether this difference can be found in other fully selective contexts.

Of the factors measured by the SAAS-R, only motivation/self-regulation was useful in predicting group membership in this study. Whilst goal valuation, attitude to school and attitude to teachers were highly correlated and showed differences in their relationships for
achievers and underachievers, only motivation/self-regulation was useful in predicting group membership. This replicates previous research by McCoach and Siegle (2003). Results in this study indicated that for every point lower a student scored on the motivation/self-regulation items, he or she was 6% more likely to be an underachiever after controlling for the other factors. As indicated in previous chapters, the SAAS-R measures motivation/self-regulation around behaviours in school that show that students can study appropriately, be organised, put a lot of effort into their studies and express that they are self-motivated to do their school work. This factor being a predictor for achievement level suggests that the ability to manage important self-regulatory behaviours and be self-motivated are key to differences in achievement level in gifted students in self-contained gifted contexts. Whilst it would be expected that goal valuation, attitude to school and attitude to teachers would be influential on the classification of students, it seems that once motivation is added into the logistic regression that these factors become less useful in predicting achievement level in these schooling contexts. Attitude toward school was not excluded from the model until the third analysis; an interesting finding as this factor was not found to differentiate between the two achievement level groups in the t-test analysis. However, this factor was correlated with other factors in the study and in particular academic self-efficacy and attitude toward teachers. This finding may be related to the schooling context and the big-fish-little-pond syndrome as students who underachieve may compare their achievement with others in their cohort and then perhaps question their placement in such a cohort.

The finding that goal valuation, attitude toward school and attitude toward teachers were not predictive in this context also indicates the importance of motivation/self-regulation, which supports a large body of research suggesting that motivation/self-
regulation is important in achievement for people in general (McClelland & Wanless, 2012; Schunk, 1991b, 1989b, 1994, 1995; Wigfield et al., 2008) as well as for gifted individuals (Clinkenbeard, 2012; McCoach & Reis, 2000; McCoach & Siegle, 2003a, 2005, 2012; Pajares & Graham, 1999; Pajares & Schunk, 2001a, 2001b; Ritchotte et al., 2014). In this context, the development of the self-regulation strategies which comprise motivation seem to be of particular importance for underachievers in a selective self-contained gifted context.

Denying giftedness was a variable that predicted group membership, with underachievers reporting higher use of the strategy than achievers. These results reflect previous research which suggested that underachievers typically use negative social coping strategies such as denying giftedness when trying to blend in socially (Swiatek, 2001). Whilst previous research has suggested that denying giftedness is a social coping strategy used by gifted students, particularly girls (Chan, 2003b, 2004, 2005; Rudasill et al., 2007b; Swiatek, 2001; Swiatek & Cross, 2007), to date, no study seems to have linked this strategy to being able to predict achievement level in gifted students. The results from this study add to the body of research by suggesting that when students use this social coping strategy, it is a predictor variable for being identified as an underachiever. These results suggest that for gifted students, in a self-contained gifted context, this negative social coping strategy is utilised by underachievers to possibly deflect ridicule of peers, or teachers questioning the appropriateness of their placement. The finding may also suggest that being placed in an ability-grouped context is not necessarily a protective factor from peer pressure, nor is it necessarily a protective factor against underachievement, but that instead the context alters the type of peer pressure that students navigate. Gifted underachievers in a self-contained context seem to use one of the identified negative social coping strategies to protect
themselves and explain why they are not achieving at the same level as their peers. Again, this may be a result of the big-fish-little-pond effect (Green et al., 2012; Marsh & Seaton, 2013; Marsh et al., 2008; Marsh et al., 2007), i.e., when gifted underachievers are no longer the ‘big fish’ they must socially explain their achievement level. The basis for the use of denying giftedness by underachievers in this context should be further investigated to better understand the drivers of this behaviour, notwithstanding that this study suggests that the behaviour is useful in potentially identifying those who are underachievers in gifted schooling contexts.

Interestingly, social self-efficacy was a predictor when classifying achievers and underachievers into their specific groups accurately. When the factor and each item’s mean was examined, underachieving students had a slightly higher social self-efficacy than their achieving counterparts, suggesting that achievers may be slightly less confident in their social interactions with their peers. It is surprising that social self-efficacy was a predictor variable in this study, suggesting that in a self-contained gifted context, an individual’s beliefs about their ability to engage socially are related to their achievement level. It would be more in line with the research if academic self-regulation were more useful in predicting group membership, rather than social self-efficacy, as academic self-efficacy is highly correlated with goal valuation, motivation/self-regulation, academic self-perceptions, and attitude to school and teachers (McCoach & Siegle, 2003a; Pajares, 1996a; Ritchotte et al., 2014; Schunk, 1991a; Siegle et al., 2017).

It would be logical to assume that beliefs about the ability to engage in academic learning would be useful in predicting achievement level; however, academic self-efficacy was not a predictor in this study. Instead, high social-self-efficacy was a predictor variable
in the model, resulting from the logistic regression and ROC curve analysis. This result suggests that underachievers may rely on positive social feedback from their peers rather than from teachers in a self-contained gifted class or selective school environment. This result, when viewed in the light of the correlational findings that social self-efficacy relates to achiever’s attitude toward teachers but not underachievers, suggests that for underachievers, good relationships with their peers do not relate to their attitudes to their teachers. The social self-efficacy variable being a predictor variable for underachievement in the model may also suggest that students’ relationships with their teachers are important for achieving gifted students within a self-contained gifted context and may have important implications for relational pedagogical approaches used with gifted students. However, perceptions regarding the ability to develop positive peer relationships does not impact on underachievers in the same way. The context of this study may influence this finding, in that students who have a like-minded peer group may feel less socially isolated or different, which creates a stronger sense of belonging when compared with gifted students in a typical school, reported consistently in the literature (Cross et al., 1993; Gross, 2006; Janos et al., 1983; Manaster et al., 1994; Manor-Bullock et al., 1995; Rimm, 2002; Vialle, Heave, & Ciarrochi, 2007; Vialle, Heaven, & Parrochi, 2005). For underachievers, this may mean that they choose to focus upon social relationships rather than academic achievement. Alternatively, this confidence in social ability may be a response to the big-fish-little-pond effect (Craven et al., 2000; Dai et al., 2013; Green et al., 2012; Marsh & Seaton, 2013; Marsh et al., 2008; Marsh et al., 2007), in which these students are no longer the ‘stand out’ academic achievers, and as such feel less confident academically but more confident in their social interaction with like-minded peers. This lack of social difference may give rise to some students being more
confident in their capacity to make friends, and thus may reduce their need to focus on achievement as their source of positive feedback. This discrepancy is worthy of further investigation to better understand the reasons that social self-efficacy is a predictor variable for achievement level in this study.

The model of prediction for group membership found to be most useful in this study was that of the combination of motivation/self-regulation, denying giftedness and social self-efficacy factors, along with the gender and school type variables. The motivation/self-regulation as a factor which is useful in classifying participants into achiever or underachiever categories supports previous findings by McCoach and Siegle (2003) that motivation is a key factor in achievement for gifted learners. Interestingly, the social self-efficacy factor adds to the body of knowledge regarding factors which may help to better understand and support gifted underachievers. Whilst in previous studies academic self-efficacy has been linked to peer pressure (Kiran-Esen, 2012) and depression (Muris, 2001) no link has been made between achievement level in gifted achievers and underachievers and social self-efficacy. Studies have investigated self-esteem in relationship to underachievement, and suggest that low self-esteem may be linked to underachievement (Vialle, Heave, et al., 2007; Vialle et al., 2005); however, the construct of social self-efficacy has not yet been investigated in relationship to underachievement in the gifted population in previous studies.

Gender is a variable for which there are mixed results in research, with some suggesting that gender is not a significant factor in underachievement (McCoach & Siegle, 2003a). Other research suggests that gender may be an influencing factor for achievement level, with males more likely to underachieve than females (Colangelo, Kerr, Christensen, &
Maxey, 1993; Smith, 2010). Further, research has proposed that underachievement is a teacher perception resulting from the belief that boys are underachievers and girls are hard workers (Jones & Myhill, 2004). This study supports previous research that boys are more likely to academically underachieve, however, it provides new insights into male underachievement, in that the study was completed in an ability-grouped context. This suggests that gifted male underachievement is not necessarily reduced by placing boys into an ability-grouped or selective environment. This finding suggests that there is more to gifted males underachieving than placement in a gifted program, and that for males there may need to be adjustments to factors such as curriculum design and delivery.

The final factor in this study, which is a predictor variable in the model, is that of school type. Little research has been done to investigate underachievement specifically within a gifted or academically selective context, which may be a consequence of beliefs that ability grouping should reduce or even eliminate underachievement, with most research suggesting large academic effects for gifted students in ability-grouped contexts (Adams-Byers, Whitsell, & Moon, 2004b; Eddles-Hirsch, Vialle, Rogers, & McCormick, 2010; Neihart, 2007b; Rogers, 2001, 2007). This finding deserves further investigation to ascertain why this may be the case, to ensure that the results were not by chance and in fact can provide insights into the nature of underachievement in fully selective schools.

The model developed in this study for predicting group membership indicates that there may be hope in finding ways to better understand gifted underachievement in students who are placed in ability-grouped school contexts.
5.3.5. Identifying gifted underachievers through the level of response to the predictive variables on the instrument

The ROC curve analysis suggests that these instruments may be useful not only in understanding the theoretical risk factors that predict group membership, but that these factors may be useful in practically identifying students who are vulnerable to underachievement, using the five factors identified by the logistic regression model and then the ROC curve. The ROC curve result enables educators to assess an individual’s vulnerability to underachievement based on the response they report to the survey instrument. Initial results indicated that the model is useful in identifying vulnerability to underachievement using the scores of individuals on the survey factors – motivation/self-regulation, denying giftedness and social self-efficacy — and combining this with the additional demographic variables of gender and school type. Individuals who score below the identified level on the motivation scale (via the SAAS-R questionnaire), and above the identified level on the denying giftedness scale and the social self-efficacy scale, can be flagged as at risk and potentially appropriate for support without schools waiting for identification of these students through academic underperformance on school-based achievement assessments. An intervention approach such as the Achievement Orientation Model (AOM) approach (Rubenstein et al., 2012b) may be useful in addressing the motivational levels of such students. This methodology would need to be further validated as it has not been applied (to the researcher’s knowledge) in the field of educational psychology and more specifically in the investigation of underachievement in gifted students. Previous application of ROC analysis in the field of clinical psychology has shown some
merit, with application to identify young people potentially vulnerable to depression having been trialled in clinical psychological research (Pintea & Moldovan, 2009; Youngstrom, 2014). The application of this approach in educational psychology is worth investigating in the identification of gifted students vulnerable to underachievement, prior to entry into gifted programs and before they are formally identified through their performance. The finding may provide schools and practitioners with an instrument with which to identify students at risk of underachievement and in response provide appropriate interventions to proactively address and possibly prevent this underachievement. This discovery may extend the findings of McCoach and Siegle (2003b) and research into appropriate interventions for underachievers such as the AOM (Rubenstein et al., 2012). If educators can flag individuals at risk of underachievement before the onset of chronic underachievement, then the number of underachievers in school contexts could be potentially reduced. Furthermore, this methodology may be extended outside the field of gifted education and into educational practices in which it is useful to flag individuals at risk of social and emotional challenges and achievement issues before behaviours or obstacles to learning become insurmountable.

In summary, the model developed in this study suggests that school type, gender, level of motivation/self-regulation, use of denying giftedness as a social coping strategy, and level of social self-efficacy are likely predictors of a gifted student’s achievement level. It may even be useful to identify the risk factors for underachievement in particular contexts and enable educators to be more proactive in their response to underachievement.

Overall, the study provides unique insights into underachievement in ability-grouped or selective schooling contexts for gifted students. The study provides a unique model of
variables that predict and may identify gifted underachievers, as well as highlighting the differences between gifted achievers and underachievers in such schooling environments.
Chapter 6. Conclusions

This Chapter aims to present the final conclusions of the study. The chapter is divided into sections. Firstly, aiming to provide insights for theory, research and practice (e.g., for those working with gifted underachievers). Second, an exploration of the particularly novel insights in the current findings is reconciled with previous theory and research to suggest implications and applications of these results for researchers and practitioners. Third, limitations of the study are discussed to provide important context with which the study’s results should be interpreted. Finally, a conclusion of the study’s contributions to the field is presented.

6.1. Implications for Theory

This study has implications for researchers in educational psychology concerning gifted underachievement and the factors which relate to this underachievement in a self-contained gifted or ability-grouped context. This research has added a dimension to our understanding of the characteristics of gifted underachievement, in that social self-efficacy is an important factor in identifying underachievers in a selective or gifted context. In particular, it has revealed the seemingly counter-intuitive finding that high social self-efficacy is a predictor variable for underachievement. The study also contributes to our understanding of the impact of social cognition in shaping the differences in perceptions between achievers and underachievers in an ability-grouped or selective school environment. Gifted underachievers report more negative attitudes toward their teachers, have lower levels of academic self-efficacy, as well as being more likely to use denying giftedness as a coping
strategy when in an ability-grouped context. This adds to the underachievement theory, as even when placed in an ability-grouped context, underachieving gifted students feel the need to deny their ability. They may also still have negative attitudes towards their teachers and are likely be at higher risk of underachievement if they feel socially confident within this schooling context.

The model proposed by the findings in this study (see Figure 5.1) represents a more complete view of gifted underachievement, introducing social self-efficacy and social coping strategies as factors that contribute to and are indicative of underachievement in a self-contained gifted learning environment. It is important to develop a comprehensive model of gifted underachievement, in self-contained gifted learning environments as researchers work to better understand and support those gifted individuals vulnerable to underachievement. By examining a number of variables at once within the model, the relationships between the factors can be examined in conjunction with identifying factors that predict vulnerability to underachievement in a selective or ability-grouped learning environment. This predictive model of underachievement, developed with the additional application of understanding the level at which particular factors are useful in proactively identifying those vulnerable to underachievement prior to entry into a gifted context, provides important theoretical underpinnings in the use of ROC curve analysis within the educational psychology field. Beyond that, it also provides an improved model for identification of gifted underachievers.
Figure 6.1 Revised Theoretical Framework – Model of Factors Related to Underachievement in Gifted Students

The revised theoretical framework represented in Figure 6.1 illustrates the way in which factors relate to underachievement in the two identified groups – gifted achievers and gifted underachievers. The thick black arrows indicate differences between achievers and underachievers. The blue arrows indicate factors that predict group membership and can be used as identifying risk factors, and the black curved arrows indicate variables that correlate in achievers and underachievers differently.

SAAS-R – School Attitudes Assessment Survey – Revised
SEQC – Self-Efficacy Questionnaire for Children
SCQ – Social Coping Questionnaire
Finally, the research has theoretical implications regarding the use of the chosen survey instruments, the SAAS-R and the SEQC, as it has contributed to the validity of these instruments for use in future research with the gifted population. The study confirmed their usefulness with academically gifted secondary students in Australian selective schools and ability-grouped contexts to better understand the differences between achievers and underachievers. It also provides a new framework for identifying gifted students vulnerable to academic underachievement prior to them academically underperforming in their schooling context, through the use of the survey instruments that can identify a student’s level of risk before they are officially identified as an underachiever. Research into ability-grouped gifted programs and interventions for gifted underachievers, as well as the construct of gifted underachievement, can utilise these instruments, in combination, to better identify and understand the phenomenon of underachievement in gifted students. It provides a new way to measure the risk factors for gifted underachievement that is pre-emptive rather than retrospective and confirmatory.

The results of the study have several theoretical implications, with some results confirming previous research and other results adding new understanding to the body of knowledge. First, the link between attitude toward school, elements of some self-efficacy beliefs and social coping strategies, and differences in achievement level of gifted students in an academically selective/self-contained gifted context have reinforced previous research findings, in particular motivation/self-regulation, attitude toward teachers, goal valuation (Jovanović Vitomir et al., 2010; McCoach & Siegle, 2001, 2003a; Siegle et al., 2014; Wilson, Siegle, McCoach, Little, & Reis, 2014), academic self-efficacy (Bandura et al., 2001; Pajares, 1996b; Pajares & Schunk, 2001c), and denying giftedness (Chan, 2003b, 2004, 2005;
Swiatek, 2001; Swiatek & Dorr, 1998). Reflecting findings in previous research, one of the predictors of group membership (gifted underachievers or gifted achievers) was found to be the motivation/self-regulation factor on the SAAS-R scale (McCoach & Siegle, 2003a).

The finding of relationships between factors linked to achievement (social self-efficacy and attitude toward teachers being related, and attitude toward school and goal valuation as well as attitude toward teachers and goal valuation having correlations) supports the placement of this research into the social cognitive theoretical framework. The findings in this study suggest that attitude toward school is related to the social beliefs held by gifted individuals, in particular social self-efficacy. The difference between achievers and underachievers found in the relationships between factors in this study has theoretical implications for understanding the impact of social cognition on achievement. Specifically, differences were noted between gifted achievers and underachievers with regard to the way their social attitudes and experience may shape the development of their attitude toward school and the use of social coping strategies. The importance of the social cognitive framework in the study is in understanding the relationship between the motivation/self-regulation factor and the use of the denying giftedness as a social coping strategy for underachievers. The framework suggests that social context (in this study, that of being ability-grouped with like-minded peers) influences the way in which underachieving gifted students cope socially with their underachievement. In particular, they increase their use of the social coping strategy of denying giftedness as a way of explaining their inability to be motivated and self-regulate. Gifted underachievers in this context seem to compare their motivation and self-regulatory skills with others in this same context, and use this as a benchmark of giftedness, resulting in their denial of their capacity. This may have important
considerations for the way researchers view the impact of ability grouping on underachievement, and enhance understanding regarding the relationship between beliefs developed by gifted individuals through the feedback they gain from comparison with their peers, and the perceptions of their teachers and others when they are grouped in such a context. The new findings that school type, gender, and social self-efficacy are predictors of group membership in this study further confirm the relationship of social cognition and context to achievement for gifted students. The predictive factors (social self-efficacy, denying giftedness, motivation/self-regulation, gender and school type) are useful in identifying students at risk, adding to our theoretical understanding of the factors that contribute to the profile of gifted underachievers within a self-contained gifted or selective environment.

The experimental use of the ROC curve analysis provides researchers with an emerging approach to examine the way in which survey response data could be used not just to confirm previously correlated factors with already identified underachievers, but to proactively identify individuals potentially at risk based on their scores on the survey in this study. In order to validate this new approach, it must be replicated with other cohorts and potentially tracked longitudinally to assess the accuracy of the process. Furthermore, the research could be extended beyond the identification of and intervention for gifted underachievers into other educational fields to compare the usefulness of such statistics in educational research.

Some findings in this study challenge previous theories regarding underachievement, particularly the lack of a significant relationship between achievement level and attitude to school, a finding which has been replicated in much research into underachievement (Abu-
Hamour, 2013; Abu-Hilal & Atkinson, 1990; Çakır, 2014; McCoach & Reis, 2000; McCoach & Siegle, 2001, 2003a, 2012). Whilst there is a difference in the relationship between goal valuation and attitude to school for underachievers when compared with achievers, there was not a direct relationship established between attitude to school and achievement level. This finding suggests that the ability-grouped context influences the attitude these students have to school, with achievers and underachievers both seeing school as a place to be proud of and a good match for them. This finding may be linked to the research suggesting the environment is important in achievement (Ritchotte et al., 2014), with the ability grouping of students improving their perception of their learning environment. This study also challenges the notion of a predictable relationship between achievement and academic self-perception, with research suggesting that gifted students often maintain their high academic self-perception, even when underachieving (Bouchey & Harter, 2005; Rudasill & Callahan, 2008; Stringer, 2008; Vialle, Heave, et al., 2007; Vialle et al., 2005; Wilson et al., 2014). This finding seems again to be linked to the ability grouping context, with underachieving participants having lower academic self-perception than their achieving counterparts, and may in fact be one of the underlying reasons that these underachievers deny their giftedness. Another finding that challenged previous theoretical understandings of underachievement was that goal valuation did not predict group membership (McCoach & Siegle, 2003a), which has an important impact on our understanding of underachievement, in that these students see school as more useful for their future than previous research has suggested. This finding again seems to be linked to the ability-grouped context, since participants in this study would have been self-nominated or nominated by parents to participate in the full-time ability-grouped schooling environment, influencing valuation of the goals of school. These findings
suggest that researchers may need to investigate the impact of ability grouping on underachievement in gifted students. From a social cognitive theory perspective, this finding suggests that context or the desire to be placed in such a context shapes the beliefs that a gifted individual holds about self and school.

Other significant findings of this study to support the suggestion that underachievement is expressed and contextualised through a social cognitive lens is that gifted underachievers’ primary social coping strategy was denying giftedness. This suggests that students may use this strategy to explain to others in their social context why they are not achieving. The study also suggests that an evaluation of the Social Coping Questionnaire for use within an Australian gifted context may be necessary in order to understand whether the reasons for the reliability differences found are due to the Australian context or whether perhaps the instrument may need adjustment for use in other contexts as well (Swiatek, 1995, 2001, 2002; Swiatek & Cross, 2007; Swiatek & Dorr, 1998). This has implications for the field, as this is currently the only social coping questionnaire specifically designed for gifted students.

Overall, findings from the study suggest that within an academically selective/self-contained gifted environment, the specific factors related to underachievement might be slightly different than for those in the samples used in previous research (e.g., a mixed-ability classroom, those in AP and IB streams in the US, or those attending residential schools for gifted students) (Dai et al., 2013; McCoach & Siegle, 2003a, 2012; Ritchotte et al., 2014). This contextual difference seems to influence the way that gifted individuals perceive their giftedness, and in particular their ability to achieve well. This contextual difference may be an important contribution to the field as we examine the way to deal with gifted
underachievement in different educational environments, specifically by addressing motivation/self-regulation, goal valuation, understanding social behaviours (including denying giftedness) and differences in social self-efficacy.

6.2. Implications for Practice

The outcomes of this study also have implications for practice in that practitioners, policy makers, and other significant individuals in the lives of gifted students need to understand the practical implications of contextual differences for underachievement in gifted students. Additionally, it will be useful for practitioners and other individuals who work with gifted students to engage with an approach to identify potential underachievers proactively rather than retrospectively.

As such, in this section, the researcher will address the implications for parents, schools, teachers, administrators, policy makers and counsellors about the needs of gifted underachievers in self-contained gifted/academically selective environments in Australia.

6.2.1. Parents

With parents being one of the major influences in a gifted child’s achievement level (Baker et al., 1998; Campbell & Verna, 2007; Garn, Matthews, & Jolly, 2010) and one of the best providers of information regarding their child’s development (Garn et al., 2010; Jolly & Matthews, 2012), parents of gifted underachievers play a vital role in supporting their children. It is useful for parents to understand the factors related to gifted underachievement within an ability-grouped/selective school environment, as parents may hope that their
children’s placement in ability-grouped situation helps to prevent or remediate underachievement (Feldhusen & Kroll, 1985). Whilst there is little empirical data on this belief, many books for parents of the gifted advocate the need for ability grouping of some kind for gifted learners, with research suggesting improved academic and attitudinal results for ability-grouped gifted students (Robinson & Moon, 2003; Rogers, 2002; Walker, 2002). Parents may hope that being with other gifted students will reduce underachievement or prevent it in their gifted children. Understanding the factors that may make them more vulnerable to underachievement, even in a gifted context, may be helpful to them in supporting their gifted child at home and at school, whilst managing expectations of a school-based program to ‘fix’ a gifted underachiever.

Knowledge that underachievers are more likely to deny their giftedness and that this is related to their motivation/self-regulation may assist them in looking for the presentation signs of underachievement in their children, such as inability to manage projects or study for tests, and denying giftedness to friends or at home. Being aware that males are more likely to be identified as underachievers than females at this stage of their schooling may assist parents of gifted boys to provide supportive and nurturing environments for their sons. Parents of gifted students who attend selective high schools or self-contained gifted classes are likely to value the opportunity for their children to receive a good education; they are likely to have strong beliefs surrounding the importance of school (goal valuation) and expect that their children will hold similar beliefs. Understanding that one of the challenges for underachievers is that they do not value the goals of school as highly as other achieving gifted students, and that this also relates to their attitude to school and teachers, may assist parents in understanding some of the factors related to the underachievement of their gifted child and
that their values may not be internalised by their gifted children. Parents are often aware that their underachieving gifted children lack motivation and self-regulation, as they report conflict over homework, approaches to learning and will often report that their child lacks motivation at school (Delisle & Galbraith, 2002; Rimm, 1995, 2008). However, knowing how to appropriately respond to such challenges may be out of the reach of many parents (Rimm, 1995, 2008). Increasing parent knowledge about addressing the motivational and self-regulatory strategies (McCoach & Siegle, 2005) of underachieving gifted students may help them make decisions about how to better support their gifted young people. Whilst our understanding of the tangible role that parents play in the development of talent seems to be a theme that needs further research, improving parental understanding of the needs of gifted underachievers may be of assistance to parents in supporting them. In providing a framework in which to reference some of the behaviours they see in the home environment (Jolly & Matthews, 2012), this study and further research may enable parents to better understand and support their underachieving gifted child.

### 6.2.2. Schools

This research has practical implications for schools, particularly those in which there are self-contained gifted classes, for selective schools, and for schools considering utilising gifted classes as a programmatic intervention to address the needs of gifted learners. Research suggests that ability grouping of gifted students provides a number of benefits, including increased academic engagement and performance (Rogers, 2007), as well as increased social and emotional wellbeing (Gross & Van Vliet, 2005; Neihart, 2007a). Schools often introduce such programs to provide for gifted learners, improve academic results and to be able to ‘sell’
the benefits to gifted students of attending their school. Schools with such programs could use the understandings gained from this research to examine the presentation of underachievement within their specific context. Understanding the predictors of underachievement and how to potentially identify students at risk of underachievement may enable them to better address the challenges faced by gifted underachievers, whose performance can cause conflict between parents and schools as well as within staff ranks, regarding beliefs about these students deserving placement in the program. If schools could flag students at risk and provide supportive programs for such students, they might be able to reduce underachievement for gifted students and mitigate some of the challenges of placement and performance of students within gifted classes and selective schools.

For schools, motivation/self-regulation being a predictor variable and one of the most significant differences between achievers and underachievers in this research, demonstrates that it is an essential part of a school’s program when providing an ability-grouped learning environment. It should be used to plan how they will support students in order to reduce low motivation and self-regulation in students. McCoach and Siegle (2005) proposed that addressing the motivation and self-regulatory strategies of gifted underachievers was one of the most effective approaches to redressing underachievement. This understanding may have implications for focus on professional development for staff in order to better understand the provisions they can make to better support their underachieving gifted learners as well as mitigate underachievement, with research suggesting that appropriate professional learning can improve the attitudes of teachers and their understanding of the needs of gifted learners (Kronborg & Plunkett, 2012; Lassig, 2009).
Increasing awareness of the use of the denying giftedness as a social coping strategy for gifted students in an ability-grouped context may be of benefit, as this behaviour is more easily observed within the classroom and playground than social self-efficacy, for example. Understanding that being in a gifted classroom context does not mean that the individual necessarily believes that they have the ability may be useful in not just identifying but also in providing support programs for these gifted underachievers.

The gender differences reported in this study are an important consideration in a coeducational context, in that schools may need to address the needs of gifted underachieving males and females differently. Understanding that males are more vulnerable to more obvious underachievement than females even in an ability-grouped context has implications for the identification and support of gifted students who underachieve. It also has implications for approaches to programs for underachievers in coeducational schools, with a potential focus on the difference between males and females.

For fully selective schools, it may be worth investigating the reasons that students in this study were more likely to be identified as underachieving in a fully selective rather than partly selective environment. Whether this factor is the result of the big-fish-little-pond effect, or whether the issues are surrounding the nature of students’ motivation (that is, the intrinsic versus extrinsic motivational drivers found in previous Australian research (Gross, 1997), it is important to understand whether this finding is an anomaly or whether it is reflective of the fully selective schooling environment. The finding that participants in this sample were more likely to be identified as underachieving in a fully selective academic school invites consideration of the reasons and ways to address the issue. Whilst further investigation is required to confirm that students in fully selective environments
underachieve more than those in other contexts, or that more underachievers are identified in a fully selective school, it is worthy of consideration for selective high schools to educate staff regarding underachievement within their schools and to examine appropriate approaches to moderating the impact of underachievement for their learners.

Insights into the differences between achievers and underachievers and the relationship between social self-efficacy and attitude toward teachers in an academically selective/self-contained gifted class may provide insights into approaches to identify those at risk of underachievement and supporting underachievers. Such students may appear to be more confident in their ability to relate to their peers than their ability to self-regulate and remain motivated. This belief also seems to suggest that they may value the attitudes of their peers more than achievers do, which in turn seems to have an impact on their attitude to their teachers. As such, improving relationships with gifted underachievers through relational pedagogy, mentoring and increasing appropriate communication of teachers’ care for all students, not just high achieving students, could be useful for supporting gifted underachievers. As student perceptions of teachers’ attitudes have been linked to underachievement, it is possible that underachievers are interpreting particular types of feedback from teachers as lacking care for them, particularly in comparison with students who are achieving. Additionally, gifted achievers were more likely to view their teachers favourably than were underachievers, who were more likely to perceive teachers as neither caring nor providing appropriate interesting learning; this may reflect previous research suggesting that teachers’ performance can be an issue within a selective or self-contained gifted context (O'Brien & Vialle, 1998). Studies have shown that achievement is a high contributor to teacher attitudes towards students, in particular whether they are perceived as
gifted (Bianco & Leech, 2010; Jussim & Eccles, 1992; Lassig, 2009). Additionally, when asked to outline what a gifted student would be, teachers have reported expecting high achievement, high motivation and engagement in the learning provided for them (Freeman, 1983; Kolb & Jussim, 1994; Lassig, 2009; Redding, 1989). As underachievers violate these expectations (Jussim et al., 1987) this may cause teachers to respond more negatively than they intend. Therefore, teacher education on the impact of teachers, the perception of gifted students about their teachers, and the way in which teachers communicate with their gifted students should be examined in order support teachers to develop more positive relationships with underachieving gifted students in these contexts.

These insights may have professional development implications for schools with gifted populations in ability-grouped contexts as to the specific needs of gifted learners, and the attitudes and beliefs of gifted underachievers, whose presence in such a program may even be questioned by staff. The importance of professional learning has been supported in research to show that attitudes to gifted learners can change as a result of appropriate professional development (Geake & Gross, 2008; Kronborg & Plunkett, 2012; Lassig, 2009), and as such, schools with ability grouping for gifted students should examine underachievement as part of their professional learning goals. Overall, the study provides a framework for better understanding the characteristics, factors and approaches to identify gifted underachievers in ability-grouped learning environments.

6.2.3. Teachers

The study provides a model that enables educators, and in particular teachers, to see the many factors that relate to gifted underachievement, whilst providing a set of observable
behaviours that indicate the level of risk of a particular gifted student underachieving. For teachers of gifted students in ability-grouped contexts, understanding the nature of the attitudes and beliefs of underachievers may improve their interaction with, identification of, and support for these students. Research has suggested that teacher attitudes to underachieving gifted students tend to be more negative than those who achieve well (Colangelo et al., 1993; McCoach & Siegle, 2007). The attitudes of underachievers to their teachers are powerful barriers to achievement. As such, teacher knowledge that underachievers’ attitudes to their teachers do not improve regardless of their social capacity may give insight into some of the behaviours of gifted underachievers. It may also assist them to identify gifted underachievers through their social confidence. Additionally, it emphasises the importance of teachers developing positive relationships through more matching of the curriculum to the learning needs of gifted students.

Increased understanding of the role that motivation/self-regulation plays for their students may help teachers provide access to learning experiences that enhance self-regulation within the classroom context. This may take the form of specific programs at school or may be unique to each individual teacher, and may include self-regulation homework programs (Stoeger & Ziegler, 2005, 2008) or modification of teaching for gifted students focusing on the development of self-efficacy (Siegle & McCoach, 2007) and other influential factors.

Increased knowledge of the difference between achievers and underachievers in academically selective/self-contained gifted learning environments may be important for teachers when examining the performance of particular students who have been identified in their classes. Teachers often question the placement of underachievers or blame lack of talent
in a particular subject (Colangelo & Kelly, 1983; McCoach & Siegle, 2007) rather than this perhaps being the default response to underachievement. Better understanding of the factors related to underachievement may give classroom teachers opportunities to address these factors specifically within their teaching and the curriculum design.

Finally, the use of the predictive model of factors to identify potential underachievers may provide teachers with information regarding students at risk within their classes and give them the opportunity to address the underachievement before it becomes endemic.

### 6.2.4. Administrators and policy-makers

Increasing knowledge of the different attitudes between achievers and underachievers in selective schools and self-contained gifted classes should help administrators and policy-makers consider the policy approaches to better support these students. As the success of gifted programs is often based on the achievement of the individuals who attend these programs, better understanding of what contributes to underachievement is useful for policy-makers and administrators to evaluate and make changes to programs offered for gifted students. Whilst it is important to assess the academic outcomes of programs through student results, this cannot be the only factor (VanTassel-Baska, 2006). It is important for people who make the policy and implementation decisions regarding gifted programs to be aware of how to help students who may not perform well in such environments. This may include assessing students’ motivation and self-regulation, goal valuation, attitude toward teachers and school, as well as academic and social self-efficacy, before entry to such a program, to identify students who may need extra support. However, caution is suggested to ensure that
the risk of underachievement is not seen as a reason to exclude a student from a program if they have met the other requirements for entry.

6.2.5. Counsellors

For school counsellors, understanding the differing stressors for underachievers in schools and classes aimed at high academic achievement is important, as it provides avenues for possible interventions. Understanding the differences between achievers’ and underachievers’ attitude toward school, goal valuation, motivation/self-regulation, academic self-efficacy, social self-efficacy and the way in which these relate to each other may be useful in helping counsellors not only support the students in their care, but also to communicate with teachers regarding appropriate interventions. This knowledge may have professional learning implications for counsellors in academically selective environments and in schools where there are gifted classes to equip counsellors with better information regarding these students. This is particularly important when considering the research that suggests that many school counsellors had limited understanding of the specific needs of gifted students, and in particular gifted underachievers (Peterson, 2006, 2015; Vialle, 2012; Wood, Portman, Cigrand, & Colangelo, 2010). These findings have professional development implications as well as interventional implications for counsellors of students in a fully selective or partly selective school context. If counsellors can utilise such tools to create profiles of gifted underachievers or to identify those at risk, this may provide increased validation of supporting these students within the school context.
6.3. Limitations of the Study

When making generalisations from this study, it is important to understand the limitations of the research. This study was conducted in an Australian context in one state in schools that were partly or fully academically selective, or had self-contained gifted classes. As such, the generalisability of the findings beyond this context must be cautiously applied.

Additionally, there was only one fully selective school that agreed to participate in the study, and whilst the size of the sample from this school was significant (165 participants), the results should be interpreted cautiously when applying this research in other academically selective schools. However, it was important that a fully selective high school was part of the research, as these schools are common in the state in which the study was conducted as well as in other Australian states. Further research is recommended in fully selective schools to validate the findings from this study.

The identification of the participants as underachieving if they were function at a ‘C’ level in 3 of the 5 mandatory subjects may also be a limitation of this study. The use of the A-E grading approach in Australian schools may be a limitation in that these grades, whilst composed of several summative assessments – including end of year exams, tests and other tasks – are subjective in that they have not been moderated across multiple contexts. Whilst school systems in Australia have tried to redress this through providing student sample exemplars of different tasks with grades allocated along with an analysis of the allocation of these grades, this is the only support provided to increase the consistency of grade allocation between schools. As such, the researcher cannot be sure of the consistency of the allocation of grades between schools and whether the grades have been applied differently in a gifted context. Anecdotally, the researcher has observed there is some inconsistency in the
application of grades across schools, and literature reports that some educators can be harsh judges of students who they perceive have high ability (Cunningham et al., 2001; Reeves, 2008) and as such students who achieve a ‘C’ in such contexts may not be comparable to students receiving ‘C’s in comprehensive schools. However, since the students have been identified as being in the top 10% of academic ability it is reasonable to suggest that performing like typical learners could be seen as underachievement for this population.

The identification of students as underachieving based on grades may also have affected the identification of girls as underachievers. If girls are more likely to underachieve as a result of their higher levels of perfectionism (Tan & Chun, 2014) and their lack of risk taking in learning (Betts & Neihart, 2009), then they are more likely to achieve reasonable grades through trying to please teachers. These grades however may not reflect the full extent of their learning and may fall into Betts and Neihart (2009) category of the “successful underachiever”. Consequently, there may be fewer girls identified in this study as underachieving.

The use of purposeful sampling whilst narrowing the variability in identification of students and the provisions of the schools selected also reduces the generalisability of the study, as the results do not reflect all contexts that contain gifted students. However, the choice of purposeful sampling was to ensure that the gifted students in this study were identified using comparable standardised identification tools of ability and performance, thus reducing confounding factors related to the identification of gifted students such as teacher judgement of who is gifted and who is not, parent views and even differences in the result found between different tests.
This study did not focus on family factors or cultural background of the participants, due to the number of factors already under consideration. Adding more factors to the study would have compromised the results, and therefore it was decided to focus on the factors from the previous application of the instruments used. This means that factors outside the school context were not examined, and these factors may in fact be influences on achievement levels.

In the initial phase of the research, the pilot program showed the instruments to be appropriate for use; however, when applied to the full sample, the researcher found that the SCQ was not as reliable in this context, with only two of the seven factors being usable for this study. As such, the intended focus upon the use of social coping strategies as a possible identification tool did not include all intended factors.

The self-report nature of the survey data has vulnerabilities to bias, due to the participants wanting to answer with socially favourable responses (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, the size of the sample meant that this was the most efficient way to collect such a large amount of data on this particular group, which justified the methodology and limitations of such methodological approaches.

Finally, this study cannot address the causal relationship between the investigated factors and underachievement in gifted students. The study has found clear correlations and identified factors associated with underachievement within this population, however, it cannot claim to have uncovered the causes of underachievement.
6.4. Recommendations for Further Research

This research proposes several lines of inquiry for further research including the evaluation of the SCQ, further investigation into the differences between gifted achievers and underachievers in ability-grouped and mixed-ability settings, examining the cultural and familial factors in tandem with attitudinal research, deeper investigation into gender differences in gifted achievers and underachievers, an examination of the contextual influences that may alter the factors which relate to underachievement, the validation of the use of ROC curve analysis to assess the feasibility of the identification of gifted students through cut-points on the specific scales of the instruments, and the effect of targeted interventions based on the identification of these gifted underachievers.

The findings of this research suggest that an evaluation and possible modification of the SCQ for use in contexts such as this study may be necessary. This could improve our understanding of the social coping strategies that underachievers and achievers who are gifted use in different educational contexts. This may lead to research examining not just the differences between gifted achievers and underachievers, but differences between the observable behaviours of these two groups in different school environments.

The findings of this study suggest that further investigation of the differences between achievers and underachievers in fully and partly selective school contexts is warranted, to better understand the way that environment influences beliefs and attitude toward school, and underachievement itself. Extending this would be a comparison of the differences between these two groups within the different contexts, in order to ascertain whether context makes a significant difference in the factors impacting on gifted underachievers. This research would improve educators’ ability to remedy underachievement through targeted programs and
interventions based on addressing the specific drivers of underachievement for gifted learners, regardless of the programmatic interventions offered for gifted learners in different schools.

An examination of family and cultural perspectives within the framework of the factors would enable researchers to better determine the complex interplay of home and school contexts on the perceptions of underachievers. Understanding the influence on student backgrounds on attitudes and values related to school may help support underachieving gifted students from diverse cultural groups and familial dynamics within the educational arena. This may be particularly important to help reduce stereotyping regarding the values and attitudes of diverse cultural and familial groups for educators, to help teachers make more objective assessments of the reasons that a student may be underachieving, as well as providing insight into approaches that may be suitable for different groups.

A further examination of the impact of gender on underachievement is justified, in that males were significantly more likely to be identified and to report negative responses to school than females in this study. Much has been made of both boys’ and girls’ education in recent years. Previous studies (Angus et al., 2010; Health, 2016; Smith, 2005, 2010) suggests that boys are more likely to underachieve at school and this research shows that this is also true of boys who are grouped in a self-contained gifted or academically selective environment. Insights into the reasons behind this underachievement for males may lead to important insights into teaching gifted boys and increasing their performance, particularly considering the increasing performance of girls at school and boys being seen to be left behind. This is not to say that girls’ education is not important or than underachieving gifted girls’ needs should not be addressed; however, this study indicates that boys are
underachieving in significantly higher numbers even in learning environments that are deemed to support achievement. Further, understanding the differences between the drivers of boys’ and girls’ underachievement through comparisons of gender should be able to better address these concerns.

Additionally, further research to address the lack of consensus as to what constitutes underachievement for gifted students within the school system may assist researchers and educators to effectively refine the identification of underachievement. Addressing the lack of consistency in the application of grades and marks both within and across schools, could add more veracity to the body of research around underachievement and provide more rigorous use of the instruments in flagging students who may be at risk of underachievement. Furthermore, whilst underachievement is often considered on a more holistic, whole student approach, there may be some value in considering underachievement on a subject by subject basis to determine whether there is a cohort of students for whom subject level intervention may be beneficial, compared to those for whom underachievement is a broader challenge. As such, further research focusing on underachievement to reflect the model of underachievement which delineates between underachievers and selective consumers (Delisle, 2009; Delisle & Galbraith, 2002) may be of benefit in better understanding the nuance of underachievement within a selective / self-contained gifted schooling context.

Importantly, the validation of the use of ROC curve analysis to identify students at risk of underachievement proactively rather than retrospectively will be a significant area for investigation. This analysis has been widely used in medicine, examining risk factors for illness such as different types of cancer (Swets, 1998) and more recently in applications such as diagnosing individuals at risk of depression and other mental health issues in the field of...
clinical psychology (Pintea & Moldovan, 2009; Youngstrom, 2014). Not only will this investigation serve the body of research into gifted underachievers and the educators who serve them, but it will encourage the field of education to explore the use of such statistical analysis to validate this approach to identify risk factors and possible interventions for other groups.

6.5. Conclusion

The results of this study illustrate that underachievement is a multifaceted and complex phenomenon (Colangelo et al., 2004). There are many interacting factors which may contribute to underachievement, and these may be unique to specific individuals, contexts and environments. We have known for a long time that attitude toward school affects gifted students’ level of achievement; however, to date we have not understood the unique interplay of factors within a self-contained gifted/selective school environment. The results show that when gifted students are put in an ability-grouped situation, traditional factors such as motivation/self-regulation, attitude toward teachers, and goal valuation influence achievement. It has also provided unique insights into factors previously not found to influence underachievement, such as academic self-perception and social self-efficacy, whilst attitude to school was not found to be related in this context. This study extends educators’ understanding of the differences between achievers and underachievers in ability-grouped gifted/selective schooling environments. Specifically, it highlights the way factors relate differently for underachievers compared with achievers, through the attitudinal differences to school and teachers, the variance in their goal valuation, social self-efficacy
and motivation/self-regulation, and denying giftedness. These findings give insight into the
differences between these two groups in ability-grouped contexts.

We have known that the factors related to attitude toward school could predict group membership (gifted underachiever or gifted achiever) after the individuals had already been classified into either group. However, this study proposes a way to identify individuals at risk of underachieving on entry to a selective school or gifted class, in order to give them support with developing and maintaining motivation and self-regulation. This new approach to utilising the survey tools to identify gifted students who may be vulnerable to underachievement gives educators increased capacity to address underachievement proactively rather than retrospectively.

Whilst this study does not solve the issue of gifted students underachieving, it gives new insights into the factors influencing underachievement, and gives hope to educators that they may be able to support students who are at risk of underachievement before chronic underachievement significantly limits their achievement in school.
References


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Lassig, C. (2009). Teachers' attitudes towards the gifted: the importance of professional development and school culture.


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**Appendix A: Permissions**
A 1: Ethics Approval and Renewal, University of Wollongong

Dear Ms Phillips,

Thank you for your response dated 14 August 2011 to the HREC review of the application detailed below. I am pleased to advise that the application has been approved and forwarded to the Department of Education and Training for approval of your SERAP application.

Ethics Number: HE11/256
SERAP No: 2011114
Project Title: Social coping strategies and self-efficacy in high achieving and underachieving gifted students: An Australian Sample
Researchers: Ms Ruth Phillips, Professor Wilhelmina Vialle, Professor Karen Rogers
Approval Date: 18 August 2011
Expiry Date: 17 August 2012

The University of Wollongong/Ilawarra Shoalhaven Local Health District Social Sciences HREC is constituted and functions in accordance with the NHMRC National Statement on Ethical Conduct in Human Research. The HREC has reviewed the research proposal for compliance with the National Statement and approval of this project is conditional upon your continuing compliance with this document.

A condition of approval by the HREC is the submission of a progress report annually and a final report on completion of your project. The progress report template is available at http://www.uow.edu.au/research/rso/ethics/UOW009385.html. This report must be completed, signed by the appropriate Head of School, and returned to the Research Services Office prior to the expiry date.

As evidence of continuing compliance, the Human Research Ethics Committee also requires that researchers immediately report:

- proposed changes to the protocol including changes to investigators involved
- serious or unexpected adverse effects on participants
- unforeseen events that might affect continued ethical acceptability of the project.
Please note that approvals are granted for a twelve month period. Further extension will be considered on receipt of a progress report prior to expiry date.

If you have any queries regarding the HREC review process, please contact the Ethics Unit on phone 4221 3386 or email rso-ethics@uow.edu.au.

Yours sincerely

A/Professor Garry Hoban
Chair, Social Sciences
Human Research Ethics Committee

Cc: Prof Wilma Vialle, Faculty of Education, Bldg 67.332
RENEWAL APPROVED
In reply please quote: HE11/256

2 August 2012

Ms Ruth Phillips

Dear Ms Phillips,

Thank you for submitting the progress report. I am pleased to advise that renewal of the following Human Research Ethics application has been approved.

Ethics Number: HE11/256
Project Title: Social coping strategies and self-efficacy in high achieving and underachieving gifted students: An Australian Sample
Researchers: Ms Ruth Phillips, Professor Wilhelmina Vialle, Professor Karen Rogers
Date Approved: 2 August 2012
Renewed From: 18 August 2012
New Expiry Date: 17 August 2013

Please note that approvals are granted for a twelve month period. Further extension will be considered on receipt of a progress report prior to expiry date.

This certificate relates to the research protocol submitted in your original application and all approved amendments to date. Please remember that in addition to completing an annual report the Human Research Ethics Committee also requires that researchers immediately report:

- proposed changes to the protocol including changes to investigators involved
- serious or unexpected adverse effects on participants
- unforeseen events that might affect continued ethical acceptability of the project.

Yours sincerely,

A/Professor Garry Hoban
Chair, Social Sciences
Human Research Ethics Committee
A 2: Ethics Approval, SERAP, Department of Education and Communities NSW

Dear Mrs Phillips

SERAP Number 2011114

I refer to your application to conduct a research project in New South Wales government schools entitled "Social coping strategies and self-efficacy in high achieving and underachieving gifted students: An Australian Sample..." I am pleased to inform you that your application has been approved. You may now contact the Principals of the nominated schools to seek their participation. You should include a copy of this letter with the documents you send to schools.

This approval will remain valid until 17 August 2012.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

<table>
<thead>
<tr>
<th>Name</th>
<th>Approval expires</th>
</tr>
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<tbody>
<tr>
<td>Ruth Phillips</td>
<td>17-08-12</td>
</tr>
</tbody>
</table>

I draw your attention to the following requirements for all researchers in New South Wales government schools:

- School Principals have the right to withdraw the school from the study at any time. The approval of the Principal for the specific method of gathering information for the school must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the Research Approvals Officer before publication proceeds.

When your study is completed please forward your report marked to Manager, Schooling Research, Department of Education and Training, Locked Bag 53, Darlinghurst, NSW 2010.

Yours sincerely

Dr Max Smith
Senior Manager
Student Engagement and Program Evaluation
15 September 2011

Student Engagement and Program Evaluation Bureau
NSW Department of Education and Communities
Level 3, 1 Oxford Street, Darlinghurst NSW 2010 – Locked Bag 53, Darlinghurst NSW 1300

Telephone: 02 9244 5619 – Fax: 02 9266 8233 – Email: serap@det.nsw.edu.au
A 3: Ethics Approval, Catholic Schools Office Diocese Broken Bay
5th December, 2011

Mrs R Phillips

Dear Ruth,

Re: Coping Strategies and self-efficacy in high achieving and underachieving gifted students: An Australian Sample

Thank you for your completed Research Application form requesting permission to conduct the above evaluation in Broken Bay schools.

I am pleased to advise that permission is granted to conduct your research in [redacted].

I would appreciate your forwarding the findings of your research to me so that the Broken Bay system, as well as the participating schools, can benefit from this research.

I wish you well in this project.

Yours sincerely,

[Redacted]

Dr Tony Bracken,
Assistant Director
School Improvement

Cc: [Redacted]

A ministry of leadership and service to Catholic Schools
Child Protection Compliance
Certification by External Organisation/Self Employed Person
(to be completed by CEO (or delegate) of external service provider)

1. As an employer, I am aware of my legal obligations under the child protection legislation*. To the best of my knowledge, the employee(s)/volunteer(s) listed below who will be engaged in child-related tasks at Mackillop College Warnervale, CSO Broken Bay have complied, as necessary, with the requirements outlined in 2 to 4 below.

   * The Commission for Children & Young People Act 1998 (Part 7 Employment Screening)
   See also: http://www.kids.nsw.gov.au/kids/working.cfm

2. To my knowledge, there is nothing in the background of any of my employee(s)/volunteer(s) that would be a cause of concern in terms of working with children.

3. I have obtained a Prohibited Employment Declaration from the employee(s)/volunteer(s) listed below, who will or could possibly have direct, unsupervised contact with children during the course of their work.

4. I have taken all the necessary steps to ensure that Working With Children Background Checks have been completed for paid employee(s)** who could possibly have direct, unsupervised contact with children during the course of their work for my organisation. These employees are considered suitable for child-related employment.

   ** Note: certain unpaid volunteers or employees employed before 3 July 2000 do not need to complete a Working With Children Background Check

A. Name of organisation: University of Wollongong

I understand that adherence to these arrangements is a condition of the contract/agreement between my organisation and the school/Catholic Schools Office.

B. Name of employee(s)/volunteer(s) engaged in child-related tasks:

Ruth Phillips


Authorised by: ........................................ Position: ........................................

Name (print) ........................................ Signature: ........................................

Date: ........................................
Dear Principal,

My name is Ruth Phillips and I am currently enrolled at the University of Wollongong, working towards completing a Higher Degree in research. I would like to invite you and your school to be a part of my research. My research aims to find better ways to identify and support students who are highly able but who may not be performing to their potential. The research is unique in Australia and will also help educators better understand the needs of gifted students.

**RESEARCH TITLE:** Social coping strategies and self-efficacy in high achieving and underachieving gifted students: An Australian sample.

**RESEARCHER'S NAME:** Ruth Phillips, supervised by Professor Wilma Vialle in the department of Education at the University of Wollongong.

**Contact Details**
- **Researcher:** Mrs Ruth Phillips
- **Supervisor:** Professor Wilma Vialle, Education Faculty University of Wollongong

The intended research will involve inviting students in your Gifted classes to complete a survey reporting on the social coping strategies that they use and their self-efficacy, in relation to their level of achievement. This survey information will be completely anonymous and no student or school will be identifiable as a result of participating in this research. I understand the busy nature of schools and as such have tried to structure the research to have as little impact on staff and students as possible, if you choose to participate in my research.

If you choose to participate in the research, I would like to offer each school 2 hours of Professional Learning, at a mutually convenient time, based on the research data gathered or another topic if preferred. Participating in this research is completely voluntary, and you are free to choose not to participate and are free to withdraw from the research at any time.

Attached is information explaining the research in greater detail. If you have any further enquiries about the research, please feel free to contact me, Ruth Phillips on or Wilma Vialle, at the University of Wollongong. If you have any concerns or complaints regarding the way the research is being or has been conducted, you can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on 02 4221 4457.

I hope that you will be willing to be a part of this research. I am looking forward to your reply.

Yours Sincerely
Ruth Phillips
Mob:
University email:
A 5: Principals’ Information Sheet

University of Wollongong

Participation Information Sheet for School Principals

Descriptive Title of Project:
Social coping strategies and self-efficacy in high achieving and underachieving gifted students: An Australian Sample.

Researcher: Mrs. Ruth Phillips
Email:

Supervisor: Professor Wilma Vialle, Education Faculty University of Wollongong
Email:

AIM of the study: This researcher aims to investigate the patterns of social coping and self-efficacy in high achieving and underachieving gifted students. This research aims to:

- To better understand the needs of underachieving gifted students.
- Better identify underachieving gifted students in order to support their learning more effectively.
- Identify patterns of behaviours of high achieving and underachieving gifted students through a comparison of each group’s responses. By identifying the patterns, it is hoped that educators may be better equipped to identify students who may in the future be prone to underachievement.

Research Procedures:

School Commitment
The researcher will supply all of the appropriate physical resources required to conduct the research.

The researcher will request that a trusted and knowledgeable member of staff match students to an anonymising student number for the surveys, and indicate for each student number whether the student is achieving or underachieving.

The school will have a choice of two options to administer the research, and may select the option which is most convenient:
1. The researcher can administer the research at a mutually convenient time in the presence of the classroom teacher or other approved member of staff; or

2. The classroom teacher or other approved member of staff may administer the research on behalf of the researcher at a convenient time, forwarding the completed surveys to the researcher.

Upon completion of the research, the researcher is offering a 2-hour professional development session, at a mutually convenient time, with staff or a presentation to parents on either the results of the research or another topic chosen by the school in which the researcher has expertise.

**Time commitment**

Participants who consent to engaging in this research will be asked to complete an anonymous survey which will take approximately 30mins. Participants will be allocated a number in order to ensure their anonymity throughout the research.

The participant will be asked to participate in this research once only to complete the anonymous survey. Individual results from the survey will not be given.

**Identification of students as high achieving and underachieving**

Students will be allocated a student number on a master list, only the school will have access to the master list. A staff member chosen by the school will be asked to identify and indicate using a code high achieving and underachieving students on the master list. Students' responses will then be categorised by the researcher using the student numbers only.

**Benefits of the research:**

This research will hopefully give us more information about students who are identified at school as being highly able but who do not perform as well as expected when at school. The research may provide the education community with more sound information about the needs of these individuals and better ways to support students who have the capacity to achieve well, but who do not do so at school.

**Participation:**

Participation in this research is entirely voluntary, there is no penalty for choosing not to participate in the research and there is no penalty for choosing to discontinue involvement in the research. Students who choose not to participate in the research will be given the opportunity to engage in a relevant online learning experience for the duration of the survey.

**Data Storage and safety:**
The data for the quantitative aspects of the research will be stored digitally in documents which are password protected and any hard copies will be kept in a locked filing cabinet in the researcher's home. These resources will only be accessed by the researcher.

All data will be stored and accessible only to the researchers for a period of five years from collection. Importantly, this research aims to focus on the patterns and relationship between various factors reported to impact on achievement in gifted students and as such the institutions will not be compared nor held responsible for the factors under investigation.

**How the Information will be used:**

The information will be used in the writing of Ruth Phillips High Degree Research Thesis. The information may then be used to write journal articles and may be presented at conferences.

**Participants Anonymity and Protection:**

Information from this research will be collected anonymously by participants being assigned numbers. This will ensure that the researcher cannot identify the individual participants and their responses. The information gathered will not be used to identify particular individuals nor will individual results be given. To identify high achieving students a trusted staff member from the school will be asked to allocate a code next to the participant's number to indicate that they are a high achieving or underachieving participant. This will ensure the anonymity of the participants. The data will only be reported using groups of individuals results and as such no single individual will be identifiable in this research.

**Concerns or complaints:**

If participants have questions of clarification regarding the research they should contact Ruth Phillips

If participants or their guardians have any concerns, or complaints regarding the way the research is or has been conducted they should contact the University of Wollongong Ethics Officer on (02) 4221 4457.
A 6: Parent / Guardian Consent Form

University of Wollongong

Consent Form for Parents / Guardians

Research Title: Social Coping and Self efficacy of high achieving and underachieving gifted students: An Australian study.

Researcher’s Name: Ruth Phillips

I have read the participation information sheet and have had the opportunity to ask the researcher any further questions I may have had. I understand that my child’s participation in this research is voluntary and they may withdraw at any time from the study without affecting their treatment at school in any way.

I understand that the risks to my child are minimal in this study and have read the information sheet and asked any questions I may have about the risks. I understand that my child will be involved in completing an anonymous 30-minute survey about the types of social strategies they use and their beliefs about themselves. My child’s name will not be used to identify their responses and they will not be able to be identified in any way from the information they provide. If I have any concerns or complaints regarding the way the research is being or has been conducted I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on 4221 4457.

By signing below, I am consenting to allowing my child/ward to participate in this research by:

- Completing an anonymous 30-minute survey about the types of social strategies they use and their beliefs about themselves.

I understand that information from this research will be used for the writing of a research thesis and possibly other published studies and I consent for it to be used in this manner. I understand that neither my child/ward, nor the school will be identifiable in the reporting of this research. I understand that I may contact the researcher through email if I have questions regarding your child/ward’s participation at:

------------------------------------------------------------
Research Participation Consent Form
Both my child/ward and I have read the information sheet and understand the purpose and processes of this research as outlined in the information sheet. I give permission for my child/ward ________________ (please insert child’s name) to participate in this research.

Parent / Guardian Signature ________________________________ Date _____________

Name (please print) ________________________________

☐ iTunes: Please to indicate by ticking this box, to give permission for your child/ward to enter the draw for the iTunes voucher valued at $50 (one voucher allocated to each school site)

☐ Please tick this box to indicate that you do not give permission for your child/ward to enter the draw
Participant Information Sheet for Parents/Guardians of Participants.

Descriptive Title of Project:
Social coping strategies and self-efficacy in high achieving and underachieving gifted students: An Australian Sample.

Researcher: Mrs. Ruth Phillips

Email:

Supervisor: Professor Wilma Vialle, Education Faculty University of Wollongong

Email:

AIMS: This researcher aims to investigate the patterns of social coping and self-efficacy in high achieving and underachieving gifted students. This research aims to:

- To better understand the needs of underachieving gifted students.
- Better identify underachieving gifted students in order to support their learning more effectively.
- Identify patterns of behaviours; to increase the opportunities to students who may be prone to underachievement as a result of their need to belong and their beliefs about their abilities.

Research Procedures:

Participants who consent to engaging in this research will be asked to complete an anonymous survey which will take approximately 30mins. Participants will be allocated a number in order to ensure their anonymity throughout the research.

The participant will be asked to participate in this research once only to complete the anonymous survey.

Benefits of the research:

This research will hopefully give us more information about students who are identified at school as being highly able but who do not perform as well as expected when at school. The research may provide the education community with more sound information about the needs of these individuals and better ways to support students who have the capacity to achieve well, but who do not do so at school.
Participation:

Participation in this research is entirely voluntary, there is no penalty for choosing not to participate in the research and there is no penalty for choosing to discontinue involvement in the research. Students who choose not to participate in the survey will be offered an online learning activity in which they can engage.

Participants will be given the opportunity to enter the draw to win an iTunes voucher valued at $50 (one iTunes voucher will be allocated per school) and an iPod Nano (only ONE iPod Nano allocated across all participating schools). These prizes cannot be exchanged for money. The draw for the iPod Nano will be completed once all school have completed the surveys. Parents may choose for child not to enter this draw.

Data Storage and safety:

The data for the quantitative aspects of the research will be stored digitally in documents which are password protected and any hard copies will be kept in a locked filing cabinet in the researcher’s home. These resources will only be accessed by the researcher.

All data will be stored and accessible only to the researchers for a period of five years from collection. Importantly, this research aims to focus on the patterns and relationship between various factors reported to impact on achievement in gifted students and as such the institutions will not be compared nor held responsible for the factors under investigation.

How the Information will be used:

The information will be used in the writing of Ruth Phillips Masters of Education Research Thesis. The information may then be used to write journal articles and may be presented at conferences.

Participants Anonymity and Protection:

Information from this research will be collected anonymously by participants being assigned numbers. This will ensure that the researcher cannot identify the individual participants and their responses. To identify high achieving students a trusted staff member from the school will be asked to allocate a code next to the participant’s number to indicate that they are a high achieving or underachieving participant. This will ensure the anonymity of the participants. The data will only be reported using groups of individuals results and as such no single individual will be identifiable in this research.

Concerns or complaints:

If participants have questions of clarification regarding the research they should contact Ruth Phillips

If participants or their guardians have any concerns, or complaints regarding the way the research is or has been conducted they should contact the University of Wollongong Ethics Officer on (02) 42214457.
A 8: Participant Consent Form

University of Wollongong

PARTICIPANT’S COPY

Research Title: Social Coping and Self-efficacy of high achieving and underachieving gifted students: An Australian Study.

You are invited to participate in a study of patterns of social coping and self-efficacy in gifted students with different levels of achievement.

The purpose of the study is to better understand the needs of gifted students and identify patterns of social coping and self-efficacy through a comparison of student responses. The study is being conducted by a student from the University of Wollongong, Ruth Phillips.

Researcher: Mrs. Ruth Phillips
Email: 

Supervisor: Professor Wilma Vialle, Education Faculty University of Wollongong
Email: 

If you decide to participate, you will be asked to complete an anonymous survey which will take approximately 30mins. Other than your time, nothing else will be required of you for this research.

To ensure your anonymity you will be allocated a student number which will be kept on a master list at your school throughout the research. The researcher will not have access to the master list, only the student numbers. Individual results from the survey will not be given or shared in anyway. If you choose to participate in this survey you will be given the opportunity to go into a draw to win an iTunes gifted voucher worth $50 or an iPod Shuffle. You may choose not to be entered in the draw if you wish.

Any information or personal details gathered in the course of the study are strictly confidential. No individual will be identified in any publication of the results. Only the researcher will have access to data which will be protected. The information will be used in the writing of Ruth Phillips’ Research Thesis. The information may then be used to write journal articles and may be presented at conferences; however, the identity of individual schools will be protected and no individual student results will be reported.

If participants have questions of clarification regarding the research they are encouraged to contact Ruth Phillips, using the email address above.

If you decide to participate, you are free to withdraw from further participation in the research at any time without having to give a reason and without consequence.
Participant Consent

I, ______________________________, have read and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant’s Name:  
(block letters)

Participant’s Signature: ___________________________ Date: ___________________________

Parent/Guardian Consent

I __________________________, Parent/guardian of ______________________ have read and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to allow my child/ward to participate in this research, knowing that they can withdraw from further participation in the research at any time without consequence. We have been given a copy of this form to keep.

Parent/Guardians Name:  
(block letters)

Participant’s Parent/Guardian’s Signature: ___________________________ Date: ___________________________
Participant Information Sheet for Students

Descriptive Title of Project:
Social coping strategies and self-efficacy in high achieving and underachieving gifted students: An Australian Sample.

Researcher: Mrs. Ruth Phillips

Email:

Supervisor: Professor Wilma Vialle, Education Faculty University of Wollongong

Email:

AIMS: This researcher aims to investigate the patterns of social coping and self-efficacy in high achieving and underachieving gifted students. This research aims to:

- To better understand the needs of underachieving gifted students.
- Better identify underachieving gifted students in order to support their learning more effectively.
- Identify patterns of behaviours; this may be effective in predicting students who may be prone to underachievement as a result of their need to belong and their beliefs about their abilities.

Research Procedures:
Participants who consent to engaging in this research will be asked to complete an anonymous survey which will take approximately 30mins. Participants will be allocated a number in order to ensure their anonymity throughout the research.

The participant will be asked to participate in this research once only to complete the anonymous survey.

**Benefits of the research:**

This research will hopefully give us more information about students who are identified at school as being highly able but who do not perform as well as expected when at school. The research may provide the education community with more sound information about the needs of these individuals and better ways to support students who have the capacity to achieve well, but who do not do so at school.

**Participation:**

Participation in this research is entirely voluntary, there is no penalty for choosing not to participate in the research and there is no penalty for choosing to discontinue involvement in the research.

In acknowledgement of the time participants contribute to this research, they will be given the opportunity to enter the draw to win an iTunes voucher valued at $50 (one iTunes voucher will be allocated per school) and an iPod Nano (only ONE iPod Nano allocated across all participating schools). These prizes cannot be exchanged for money. The draw for the iPod Nano will be completed once all school have completed the surveys. Parents may choose for child not to enter this draw.

**Data Storage and safety:**
The data for the quantitative aspects of the research will be stored digitally in documents which are password protected and any hard copies will be kept in a locked filing cabinet in the researcher’s home. These resources will only be accessed by the researcher.

All data will be stored and accessible only to the researchers for a period of five years from collection. Importantly, this research aims to focus on the patterns and relationship between various factors reported to impact on achievement in gifted students and as such the institutions will not be compared nor held responsible for the factors under investigation.

**How the Information will be used:**

The information will be used in the writing of Ruth Phillips Masters of Education Research Thesis. The information may then be used to write journal articles and may be presented at conferences.

**Participants Anonymity and Protection:**

Information from this research will be collected anonymously by participants being assigned numbers. This will ensure that the researcher cannot identify the individual participants and their responses. To identify high achieving students a trusted staff member from the school will be asked to allocate a code next to the participant’s number to indicate that they are a high achieving or underachieving participant. This will ensure the anonymity of the participants. The data will only be reported using groups of individual’s results and as such no single individual will be identifiable in this research. The School will also not be identifiable in this research in anyway.

**Concerns or complaints:**
If participants have questions of clarification regarding the research they should contact Ruth Phillips.

If participants or their guardians have any concerns, or complaints regarding the way the research is or has been conducted they should contact the University of Wollongong Ethics Officer on (02) 42214457.
A 10: Alternate Student / Child Consent Form

University of Wollongong

Consent Form for Children

Research Title: Social Coping and Self efficacy of high achieving and underachieving gifted students: An Australian Study.

Researcher’s Name: Ruth Phillips

I have read the participation information sheet and have had the opportunity to ask the researcher any further questions I may have had. I understand that my participation in this research is voluntary and I may withdraw at any time from the study without affecting my treatment at school in any way.

I understand that the risks to me are minimal in this study and have read the information sheet and asked any questions I may have about the risks. I understand that I will be involved in completing an anonymous 30-minute survey about the types of social strategies you use and your beliefs about yourself. My name will not be used to identify my responses and I will not be able to be identified in any way from the information I provide.

If I have any concerns or complaints regarding the way the research is or has been conducted I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on 4221 4457.

By signing below, I am consenting to:

- Completing in completing an anonymous 30-minute survey about the types of social strategies you use and your beliefs about yourself.

I understand that information from me will be used for a thesis and possibly other published studies and I consent for it to be used in this manner.

I give permission for my child _________________________________ (please insert your child’s name) to participate in this research.

Parent/ Guardian Signature _________________________________________

Date___________ Name (please print) _______________________________
Child’s signature _______________________________
Appendix B: Survey
Instructions: Please place the student number you have been given on the top of each page. This student number is to ensure your anonymity - that I do not know who you are individually, but that I am able to identify which year group you fall into and which school you attend.

On the following pages are a series of items/statements which I would like you to think about and then indicate which rating best describes how this item relates to you. There is no right or wrong choice and your individual answers will not be shared with anyone else.

Read each item carefully and choose the rating which best describes how the item relates to you. Place a tick in the box under the rating which best fits how the item describes you. Don’t leave any item unchecked. 1 = the best fit and 7 = this does not describe you at all.

<table>
<thead>
<tr>
<th>Item</th>
<th>1 = strongly true</th>
<th>2 = moderately true</th>
<th>3 = somewhat true</th>
<th>4 = neither false nor true</th>
<th>5 = somewhat false</th>
<th>6 = moderately false</th>
<th>7 = strongly false</th>
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<tbody>
<tr>
<td>I don’t think that I am gifted</td>
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<td>People think I am gifted, but they are mistaken</td>
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<td>I am not gifted; I am just lucky in school</td>
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<td>As I get older and academic work gets more difficult, people will stop seeing me as gifted</td>
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<td>Most of the successes I experience are due to luck</td>
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<td>There are many people who are more gifted than I am</td>
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<td>I try not to be too successful at the things I do</td>
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<td>I don’t tell people that I am gifted</td>
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<td>I find friends who have interests similar to mine by getting involved in extracurricular activities</td>
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<td>I spent a lot of time on extracurricular activities</td>
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<td>Because of all my activities, I don’t have time to worry about whether or not I am popular</td>
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<td>I explain course material to other students when they don’t understand it</td>
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<td>I keep myself quite busy most of the time</td>
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<td>I use what I know to help others</td>
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<td>People come to me for help with their homework</td>
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<td>I spend part of my time in group study sessions</td>
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<td>I tell a lot of jokes in school</td>
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<td>Item</td>
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<td>I’m good at making people laugh</td>
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<td>People think of me as a class clown</td>
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<td>Most people see me as serious</td>
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<td>I don’t like to give the appearance of being studious</td>
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<td>I don’t worry about my popularity</td>
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<td>I try to act very much like other students act</td>
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<td>It doesn’t matter what other people think of me</td>
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<td>I try to look similar to other students</td>
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<td>Being popular is not important in the long run</td>
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<td>I try to get involved in sports so people don’t think of me as a “geek”</td>
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<td>Being gifted does not hurt my popularity</td>
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<td>I would fit in better if I were not gifted</td>
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<td>Other students do not like me any less because I am gifted</td>
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<td>I prefer doing things alone over doing things with other people</td>
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<tr>
<td>If I were not gifted, people would not like me any more or less than they do now</td>
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<td>I try not to tell people my test grades</td>
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<td>I hide my giftedness from other students</td>
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<td>I am intelligent.</td>
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<td>I am good at learning new things in school</td>
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<td>I am capable of getting straight A’s</td>
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<td>I am smart in school</td>
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<td>School is easy for me</td>
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<td>I can learn new ideas quickly in school</td>
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Read each item carefully and choose the rating which best describes how the item relates to you, indicate your choice with a tick under the rating in the box next to the item.

<table>
<thead>
<tr>
<th>Item</th>
<th>1 = strongly true</th>
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<th>3 = somewhat true</th>
<th>4 = neither false nor true</th>
<th>5 = somewhat false</th>
<th>6 = moderately false</th>
<th>7 = strongly false</th>
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<tr>
<td>I grasp complex concepts in school</td>
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<td>My classes are interesting</td>
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<td>I like my teachers</td>
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<tr>
<td>I like my classes</td>
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<td>My teachers care about me.</td>
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<td>I relate well to my teachers.</td>
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<td>Teachers make my learning interesting</td>
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<td>Most of the teachers at this school are good teachers</td>
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<td>I am glad I go to this school</td>
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<td>This school is a good match for me</td>
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<td>I am proud of this school</td>
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<td>I want to get good grades in school</td>
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<tr>
<td>It is important for me to do well in school</td>
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<tr>
<td>Doing well in school is one of my goals</td>
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<tr>
<td>I want to do my best in school</td>
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<tr>
<td>It is important to get good grades in school</td>
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<tr>
<td>Doing well in school is important for my future career goals</td>
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<tr>
<td>I work hard at school</td>
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<tr>
<td>I use a variety of strategies to learn new material.</td>
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<tr>
<td>I concentrate on my schoolwork.</td>
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<tr>
<td>I am self-motivated to do my schoolwork.</td>
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<tr>
<td>I am organized about my schoolwork.</td>
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</tbody>
</table>
Read each item carefully and choose the rating which best describes how the item relates to you, indicate your choice with a tick under the rating in the box next to the item.

<table>
<thead>
<tr>
<th>Item</th>
<th>1 = strongly true</th>
<th>2 = moderately true</th>
<th>3 = somewhat true</th>
<th>4 = neither false nor true</th>
<th>5 = somewhat false</th>
<th>6 = moderately false</th>
<th>7 = strongly false</th>
</tr>
</thead>
<tbody>
<tr>
<td>I spend a lot of time on my schoolwork.</td>
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<td>I complete my schoolwork regularly.</td>
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<tr>
<td>I put a lot of effort into my schoolwork.</td>
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<tr>
<td>I check my assignments before I turn them in.</td>
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<tr>
<td>I am a responsible student.</td>
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</tbody>
</table>

Read each item carefully and choose the rating which best describes how the item relates to you, indicate your choice with a tick under the rating in the box next to the item.

Each item has to be scored on a 5-point scale with 1 not at all and 5 very well. Choose the rating that best describes you.

<table>
<thead>
<tr>
<th>Item</th>
<th>1 = not at all</th>
<th>2 = Less well than I would like</th>
<th>3 = neither well nor not well</th>
<th>4 = well</th>
<th>5 = very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>How well can you get teachers to help you when you get stuck on schoolwork?</td>
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<tr>
<td>How well can you study when there are other interesting things to do?</td>
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<tr>
<td>How well can you study a chapter for a test?</td>
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<tr>
<td>How well do you succeed in finishing all your homework every day?</td>
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<tr>
<td>How well can you pay attention during every class?</td>
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<tr>
<td>How well do you succeed in passing all subjects?</td>
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<tr>
<td>How well do you succeed in satisfying your parents with your schoolwork?</td>
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<tr>
<td>How well do you succeed in passing a test?</td>
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<tr>
<td>How well can you express your opinions when other classmates disagree with you?</td>
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</tr>
<tr>
<td>Item</td>
<td>1= not at all</td>
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<tr>
<td>How well can you become friends with other people your peers?</td>
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<td>How well can you have a chat with an unfamiliar person?</td>
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<tr>
<td>How well can you work in harmony with your classmates?</td>
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<tr>
<td>How well can you tell other children that they are doing something that you don’t like?</td>
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<tr>
<td>How well can you tell a funny event to a group of your peers?</td>
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<tr>
<td>How well do you succeed in staying friends with other children?</td>
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<tr>
<td>How well do you succeed in preventing quarrels with other children?</td>
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<tr>
<td>How well do you succeed in cheering yourself up when an unpleasant event has happened?</td>
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<td>How well do you succeed in becoming calm again when you are very scared?</td>
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<tr>
<td>How well can you prevent to become nervous?</td>
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<tr>
<td>How well can you control your feelings?</td>
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<td>How well can you give yourself a peptalk when you feel low?</td>
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<tr>
<td>How well can you tell a friend that you don’t feel well?</td>
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<tr>
<td>How well do you succeed in suppressing unpleasant thoughts?</td>
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<tr>
<td>How well do you succeed in not worrying about things that might happen?</td>
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</table>

Please indicate which of the below matches you.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
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</thead>
<tbody>
<tr>
<td>Grade/ Year level</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Allocated to group</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>