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Hands up for Gender Equality: A Major Study into Confidence and Career Intentions of Adolescent Girls and Boys

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Research into gender disparity and access to senior leadership roles continues to highlight key differences between men and women in a number of areas. These differences include levels of self-efficacy, leadership development pathways and the smaller numbers of women entering some STEM careers. This research indicates that some of the causes of continued gender disparity in certain industries, and in gaining access to senior leadership roles in particular, can be traced to influences surrounding the experiences and decisions made in childhood and early high school years by boys and girls. The current study was designed to shed "further light upon the attitudes, experiences, activities and decisions of Australian boys and girls in these formative years.

The *Hands up for Gender Equality* project was scoped by Dr Terrance Fitzsimmons and Professor Victor Callan of The University of Queensland Business School, in cooperation with the Alliance of Girls' Schools Australasia, the Australian Gender Equality Council, JIIG-CAL Australia and thirteen of the highest university matriculation achieving single sex schools throughout South East Queensland. The project arose primarily from the findings of a study into the reasons for the lack of female CEOs in listed public companies in Australia (Fitzsimmons, 2011). In addition, another major driver for the current study was a study that examined the heightened levels of gender inequality in Western Australia through the 'Filling the Pool' report (Fitzsimmons & Callan, 2015) undertaken by the Committee for Perth.

The decision to select single sex schools was primarily to control for the potential effects that co-education may have upon girl's self-confidence. The decision was based upon extensive research that indicates gendered barriers in workplaces, related to structures surrounding male ways of working, have contributed to undermining women's self-confidence. Likewise, studies of differences between adolescent boy's and girl's self-esteem have also shown that girls have significantly less self-esteem than boys (Robins, Trzesniewski, Tracy, Gosling and Potter, 2002). However, those studies were conducted in mixed sex environments without regard to controlling the environment of the sample. The current study set out to deliberately measure self-confidence for girls in an environment that was less likely to be the subject of these potential barriers and/or influences, and to identify whether such an environment has an effect upon levels of self-confidence.

Debate has continued over the last decade as to whether women are less confident than men and whether this is innate or socially constructed (Eagly & Carli, 2007; Fox, 2017; Sandberg, 2014). However, to date, there have been few examinations into whether boys and girls actually differ in self-confidence, and what experiences and activities may act to impact upon levels of self-confidence. Further, while we understand that career intentions, including STEM careers, are developed early, little is known about what these intentions are upon entering high school and whether these change over the time spent in high school.

Understanding whether these gender differences exist under all conditions was seen as filling a large gap in the knowledge required to address gender inequality in the workplace by the Australian Gender Equality Council (AGEC) and the Alliance of Girls' Schools Australasia, who asked the AIBE Centre for Workplace Gender Equality to undertake this study. The Alliance of Girls' Schools Australasia, who initially approached the research team with the hypothesis that single sex girls' schools might be a context in which to test confidence in boys and girls, were also instrumental in facilitating access to the schools surveyed and assisted in scoping the questions to be put to students.

Throughout the report we use the terms self-confidence and self-efficacy interchangeably, since the measurement tool used in this research applies the term self-efficacy to what is, in everyday language, considered to equate to self-confidence. The instrument used in the surveys measures general self-efficacy as well as social self-efficacy. General self-efficacy is one's belief in one's ability to succeed in specific situations or tasks, while social self-efficacy is one's belief in one's ability to succeed in interpersonal engagements. When combined, the results of these two measures are often used to describe self-confidence generally.

This report analyses and reports upon the results of surveys conducted with 10,076 students at single-sex schools that are drawn from among the top schools with regard to matriculation results in Queensland.

Additional sources of empirical data were collected and have been represented throughout this report to develop a broader understanding of the results presented.

Key Findings

Self-confidence

The study found that there were no significant differences between the social self-efficacy of boys and girls at any age. With the exception of a small difference in Year 10, which was corrected in Year 11, the same was true of general self-efficacy. In terms of overall self-confidence there was no significant difference found between boys and girls. The study demonstrates that at least under one set of conditions, girls in single-sex schools, there is absolutely no gender difference in this important workplace entry attribute.

Activities that Predict Self-confidence

The study examined over 20 activities that adolescents engage in to identify which of these activities are responsible for producing the greatest levels of self-confidence and whether these differed by gender. The study found that boys and girls derive equal amounts of self-confidence from the same activities. For example, girls in single-sex schools derived just as much confidence from participating in team sports as did boys. The three activities which generated the most self-confidence, in order of level of contribution were:

1. Travel
2. Team sport
3. Participation in leadership roles and leadership development.

Overall, computer gaming and social media usage were identified as the greatest detractors from the development of self-confidence.

Unsupervised Activities are Greater Predictors of Confidence Development

The research examined the effect of adult supervision on the development of self-confidence. The study found that unsupervised activities are a significantly greater source of self-confidence than those which are directly supervised. This is not to say that there is a complete absence of adult involvement in these activities. Adults still play a role in framing activities, for example. However, the confidence boost comes from implementing or engaging in the activity, or significant proportions of the activity, without direct adult oversight. Adults also play a role in helping students to debrief or process what they may have gained from the experience.

Hours Spent on Study per Week by Age and Gender

Girls are spending more time per week studying than boys at all ages. The amount of time spent on study by boys and girls increases with age, with the most study time spent in Year 11. For example, girls spend on average 15 hours per week on study at home in Year 11 whereas boys spend 11 hours.

Self-confidence Declines by Age

The study found that levels of self-confidence decline for both girls and boys as they get older. This effect has already been identified in earlier studies.

Doing Chores (Indoor/Outdoor)

The study measured gender differences in the activities of boys and girls outside of school. There was a significant difference between the types of chores undertaken by boys and girls. Boys were more likely to engage in outdoor chores compared to girls. This finding is similar to what emerged from the Westpac 'Kids and Money' Report (2016). When combined with the findings of previous studies related to the differential amounts of pocket money received by girls and boys, it would seem to indicate that outdoor chores are more valued by parents in terms of remuneration than indoor chores. It was also found that children who undertake chores have increased levels of self-confidence, though the effect declines beyond 6 hours of chores per week.

Outdoor and Indoor Activities

In line with the theme identified for chores, boys are also spending a lot more time, relative to girls, on outdoor activities and team sports in particular. Team sport, of all of the activities measured, produced the second highest overall contribution to self-confidence.

Clear Benefit of Having a Part-Time Job on Social Self-confidence

The study found that most high school students in this study, did not have part-time jobs. Even by Year 11 there were more boys and girls without part-time jobs than those with part-time jobs. However, those who did have a part-time job showed significantly greater levels of self-confidence than those without. Boys and girls held part-time jobs in the same proportions.

Travel Contributes to Overall Self-confidence

Travel was the most significant factor in predicting greater self-confidence. However, the three types of travel measured; intrastate, interstate and international, showed different effects. The greatest influence on confidence was for local and interstate travel and the least effect size was international travel. In addition, the effect size relates to the level of adult supervision. Local travel on holidays, for example, is likely to allow for children to spend more unsupervised time away from adults relative to trips either interstate or overseas.

Leadership Roles & Leadership Development increases Self-confidence

Students who had previously held or currently hold a leadership role enjoyed significantly higher levels of social efficacy relative to those who had no leadership role experience. Also, those who had participated in leadership development courses also had higher social efficacy. Notably, leadership experiences produced similar effects at all age levels, meaning that leadership roles and courses offer students positive benefits when considering their overall self-confidence equally regardless of age.

Top 5 Reasons for Wanting to Work are Identical for Boys & Girls (with one critical exception)

The study measured the reasons why boys and girls would want to pursue a career. There are persistent claims that men and women have differing reasons for wanting to work. The study asked the students to rank 14 reasons for wanting to work. The study found that in terms of both ranking and proportion by boys' and girls', the top three reasons for wanting to work were identical, as were the top five reasons, with one critical exception. Girls ranked the need to help others as fourth in their reasons for wanting to work whereas this reason ranked much lower for boys.

Strength of Reasons for Wanting to Work

Girls had significantly stronger responses to the reasons for wanting to work on nearly all of the fourteen reasons compared to boys. Likewise, girls expressed more enthusiasm for wanting to undertake each of their top ten activities related to career choices relative to the boys.

Boys and Girls Differ in Career Domain Preferences upon Entering High School and these Remain Robust

Aware of past research into women's STEM career decisions and how these may change during high school, the current study examined whether decisions regarding activities related to differing career types, including science and technology, changed by gender over time. The study found a significant difference by gender in preferences for activities related to particular career domains and the career domains themselves. These domains were highly gendered and had already been formed prior to entry to high school. While some individual activity preferences changed by age, overall career domain preferences remained robust and unchanged from Year 7 through to Year 11.

Awareness of Parents' Careers and Qualifications begins Earlier for Boys

Boys had a greater and earlier understanding of their mother's and particularly their father's occupations. Boys and girls who have an understanding of their parents' degrees and careers demonstrated a higher degree of self-confidence than those who did not.

In Year 7, 15% of girls could not name either their mother's or father's occupations. Whereas only 6% of boys did not know their fathers occupation. Girls in Year 11 still stood at 9% not knowing their parents' occupations. Similarly, boys had a greater and earlier understanding of their mother's and particularly their father's qualifications.

Privilege Befalls Boys in both Campus Size and Play Space at School

In terms of high matriculation single-sex schools, boys are privileged with 1.5 times the amount of campus space within the immediate school grounds compared to girls and with 3 times the amount of space for outdoor play within the immediate school grounds compared to girls. This did not impact upon confidence levels between boys and girls, but may have some influence on indoor/outdoor career orientation. Note, this measure does not account for external sporting fields or outdoor education facilities but rather that space which is immediately available to boys and girls upon exit of classroom facilities.

The Research Should be Repeated in High Matriculation Co-educational Schools

While research into adolescent confidence and career formation intentions has previously been conducted outside of Australia using co-educational samples, the findings of this study seem to indicate an effect related to single sex education. Likewise, the leadership experiences of girls and boys in co-educational schools may differ from those reported here. The study should therefore be repeated in co-educational schools with equivalent rates of university matriculation to test these findings.

Recommendations

- It is recommended that wherever possible, children should be given unsupervised freedom to explore, interact and learn about their environment. In an age of increasing external scrutiny and legal liability, there is a temptation to increase frameworks and supervision around children. This study identifies that this comes at a potential cost to children's levels of self-efficacy.

- It is recommended that parents equally assign all kinds of chores, both indoor and outdoor, to their children regardless of gender and pay an equivalent amount per chore rather than based upon a subjective assessment of the effort expended. The gendering of chores and differential payment for indoor versus outdoor chores by parents normalises not only the gender congeniality of some kinds of work, but also gendered pay differentials for that work.

- It is recommended that both schools and parents provide and encourage further opportunities for girls to spend more time on outdoor activities. While not affecting self-confidence levels, the potential effect of either creating barriers or simply not encouraging girls to spend as much time on outdoor activities is to potentially reinforce the stereotype that boys work should be outdoors and girls work indoors.

- It is recommended that parents encourage and support their children in obtaining a part-time job and managing their time in doing so. There is a significant time commitment in having a part-time job. This time commitment may come at the expense of leisure activities and, potentially, study time. However, the benefits of having a part-time job in terms of the development of social self-efficacy and broader life skills, indicates that undertaking part-time work is important to adolescent development.

- It is recommended that schools re-evaluate the value of time spent outside of the classroom. Schools should prioritise excursions which:

    - take children outside of their immediate city/town environment
    - involve leadership development
    - enhance outdoor skills
    - involve minimal overall adult supervision

  While there is a great deal of focus on academic performance of children and pressures from parents to ensure maximum classroom time in this regard, the results of this study identify excursions and family travel as the primary source of the development of self-confidence.

- It is recommended that leadership development and the importance of leadership roles be emphasised equally at all year levels in schools. Opportunities for enacting leadership should extend beyond the traditional sport team, year captain/prefect, subject captain roles towards enabling all students to have experienced, to some degree, leading a group of other students.

- It is recommended that the focus of attention shift from secondary to primary schools in terms of undoing stereotypes around what 'boys are good at' versus what 'girls are good at'. Likewise, primary schools should do more to encourage girls to engage in activities around technology and science and boys around social services and healthcare. Role models should be sought out to speak with children about their careers that disconfirm traditional stereotypes surrounding the gender congeniality of roles such as trades people, nurses, pilots, firefighters, secretaries and so on.

- It is recommended that industries traditionally dominated by one gender send stereotype questioning role models into primary schools to talk about careers in their industry. For example, students might hear about careers from female trade's people and male nurses.

- It is recommended that parents ensure that they talk to their children about the stereotypes they are seeing on television and other types of media and actively try to disconfirm these. Parents should actively encourage their children from a young age to consider all career domains equally.

- It is recommended that parents explicitly and equally discuss their own careers and education with their boys and girls, as well as the importance of having both. Children should be aware of their parents' qualifications and/or careers from primary school age and more emphasis should be placed on informing girls of their parents', and particularly their mother's, education, qualifications and career (or work history if she is not currently working).

- It is recommended that the entertainment industry and media agencies consciously work to avoid the reinforcement of stereotypes in their productions. Children are particularly susceptible to these stereotypes.

Detailed Aims, Research Questions and Background

It is well established that self-confidence is a critical human capital in supporting progression into senior leadership roles (Eagly & Carli, 2007, Fitzsimmons, 2011; Fitzsimmons & Callan, 2015). The development of leadership skills and self-confidence extends back to experiences and decisions made in school and early career. What we do not fully understand, and the gap that this research fills, are the factors that contribute most to the development of self-confidence in adolescents and their career preferences.

The key research questions addressed in this study were:

1) Do male and female adolescents display different levels of self-confidence and do these levels change over time?

2) What environmental input factors account for these differences and do these factors change over time?

3) Do male and female adolescents have differing career preferences at school and do they change over time?

4) What environmental impact factors account for these differences and do these factors change over time?

Introduction and Overview

Australia's productivity is being negatively impacted through the inability of our society to achieve equal workforce participation and by the failure of our institutions to progress more women into senior and executive roles, both in government and the private sector.

This lack of representation of women in key industries and at senior decision-making levels of our major institutions is a significant social and economic issue for Australia, since the industries from which women are most absent are those that dominate our economy and make the largest contributions to our GDP (ABS, 2014a).

Gender inequality in workforce participation, industry participation and progression into leadership roles results in the forfeiture of a 20% increase in GDP for every year that the problem goes unresolved (Goldman Sachs, 2009; World Economic Forum, 2013). This figure represents an annual loss to the Australian economy of around $300 billion every year (ABS, 2014a).

Gender inequality is a significant and growing social issue in Australia, resulting in increased rates of poverty and insufficient retirement funds for women (ACOSS, 2012). Reporting by the World Economic Forum (World Economic Forum, 2017) shows that over the past 13 years Australia has declined from 15th to 35th in the world in overall gender equality. Addressing this decline is a matter of social justice and economic necessity if we are to remain competitive as a country and perhaps more importantly, a worthy place to live and raise our children in the 21st century.

This research explores several of the critical antecedents to gender disparity in industry occupation and leadership roles. While women in Australia comprise 45.9% of the labor force (ABS, 2014), only 5.5% of CEOs of ASX200 companies are women (ASX, 2018). This has been demonstrated not to be a pipeline problem (Eagly & Carli, 2007). For instance, women have been graduating from universities at higher rates than men since 1985, a period of time significantly more than a generation ago. The proportion of female graduates has been gradually increasing since 1985 and has comprised over 55% of all graduates since 2000 (ABS, 2012). Additionally, mining and construction are among the better paid industries in the Australian economy and yet women only occupy 12.9% and 12.0% respectively of all roles in these industries (WGEA, 2017a).

The current project attempts to unravel in particular what is happening around career preferences, a topic that remains under-researched. The numbers of women graduating from science, technology, engineering and math (STEM) based degrees are relatively low. Engineering in particular has only 15% female graduates (McDonald, Loch & Cater-Steel, 2010) and only two-thirds of these graduates move into critical operational engineering roles which are most valuable in moving into executive and CEO roles later in careers (Bowles, 2012).

Outside of the STEM fields, across critical business disciplines, such as management and law, female graduates comprised 50% and 60%, respectively in 2011. On the basis of the graduation evidence alone, many more women should be competitive candidates for junior managerial roles and management entry-level positions in organisations. Yet, despite graduating in larger numbers, the Workplace Gender Equality Agency reports that women only hold 42.69% of these junior and middle management roles (WGEA, 2018). Beyond these levels, the number of women in each level of hierarchy shrinks dramatically so that women only represent 31.37% of executives, and 17.1% of all CEOs of all firms, and only 5.5% of our largest firms (WGEA, 2018).

One reason often cited, anecdotally at least, for the relative lack of women in more senior roles is their relative reluctance to apply for these roles (Eagly & Carli, 2007). A dominant explanation is that the decision not to apply for roles is driven by a relative lack of self-confidence in women relative to men (Kay & Shipman, 2014). Another significant reason given for gender disparity in executive roles is the need for line role or operational experience in order to be eligible for executive and CEO roles (Bowles, 2012). However, the majority of operational or line roles in industries, such as mining, energy, construction and manufacturing, require the study of STEM subjects at university and working in environments that have traditionally been seen as not suited to women (Eagly & Carli, 2007). While there is some evidence to suggest that many women drop out of STEM subjects at university (Jagacinski, 2013), we know that relatively few women are enrolling in these courses in the first place (Roberts, 2014).

The root causes of low numbers of women entering engineering are known to relate to influences in childhood. For instance, we know from many studies in other countries that through parents and teachers, stereotypes are reinforced regarding 'what boys are good at' and 'what girls are good at'. This socialisation directs girls away from non-gender congenial occupations such as engineering, where math is stereotypically seen as a 'boys' subject (Buday et al., 2012; Shapiro & Williams, 2013). In Australia, for example, only 6.6% of girls undertake advanced math in Year 12 (Roberts, 2014).

Students in Australia are required to make decisions regarding subject choices at high school as early as the end of Years 7 and 8, when most students are only 13 years old. The choices regarding subjects required to study to enter certain degree courses are locked in by the end of Year 11. The decisions regarding which courses to take in Year 11 are often informed by their experiences of the subjects they have undertaken previously, along with the external influences of parents and friends. However, these early decisions made by young adolescents can preclude them from undertaking senior high school subjects which are, in turn, prerequisites for most STEM subjects at university. As Roberts (2014:4) notes 'At 15 years of age, the career ambitions of male and female students have already shaped their STEM engagement.' Understanding and addressing influences, which may simply be the reproduction of gender stereotypes, in primary and secondary schools, is therefore critical (Cheryan, 2012; Else-Quest et al., 2013).

In summary, there is a major gap in our understanding of this issue which may be driving continued gender inequality in the workplace. The gendered development of self-confidence and the non-selection of STEM subjects in early adolescence by women are major

contributors toward gender inequality in both industry composition and leadership positions in Australia. The current project investigates more comprehensively than past studies the relative contribution of various factors in influencing the development of self-confidence, as well as upon career decision making.

The Self-confidence Debate

Recent meta-analyses of all studies conducted into self-confidence reveal that women display lower self-efficacy than men across almost, though not all, achievement situations (Bleidorn et al., 2015). The effect is noted to begin in early adolescence and continues through adulthood.

The empirical validity of this outcome has been repeatedly tested and assessed as early as 1977 by Lenney (1977). While the literature indicates that low self-confidence is indeed a frequent and potentially debilitating problem among women, they are not lower in self-confidence than men in all achievement situations (Bleidorn et al., 2015). Instead, it is argued that the nature of this sex difference depends upon various situational variables such as the specific ability area, the availability of performance feedback, cultural norms, age, experience and the emphasis placed upon social comparison or evaluation. Figure 1, was reported by Robins and colleagues (2002:428) and reveals the changes in self-esteem across a lifetime using data compiled from dozens of separate studies.

It is important to note that self-esteem (used in Figure 1 for illustrative purposes) and self-efficacy or self-confidence (used throughout this report) are not identical concepts, though they are very closely related (Judge, Erez, Bono & Thoresen, 2002). Self-esteem reflects an individual's overall subjective emotional evaluation of their own worth. It is a self-judgment, as well as an attitude toward one's self. Self-efficacy, on the other hand, is one's belief in one's ability to succeed in specific situations or tasks and is often used interchangeably with the term self-confidence. One's sense of self-efficacy or self-confidence can play a major role in how one approaches goals, tasks, and challenges. Throughout this research we will refer to self-efficacy and self-confidence as being very similar and highly-related concepts.

In research interviews undertaken to explore the reasons behind the relative lack of women in CEO and executive roles in Australia (Fitzsimmons, 2011; Fitzsimmons & Callan, 2015), a lack of self-confidence was reported by almost all of the 130 female managers, executives and CEOs interviewed. This was often described as being a restraining factor in their careers. This phenomenon is well documented in the contemporary literature (Sturm, Taylor, Atwater & Braddy, 2014).

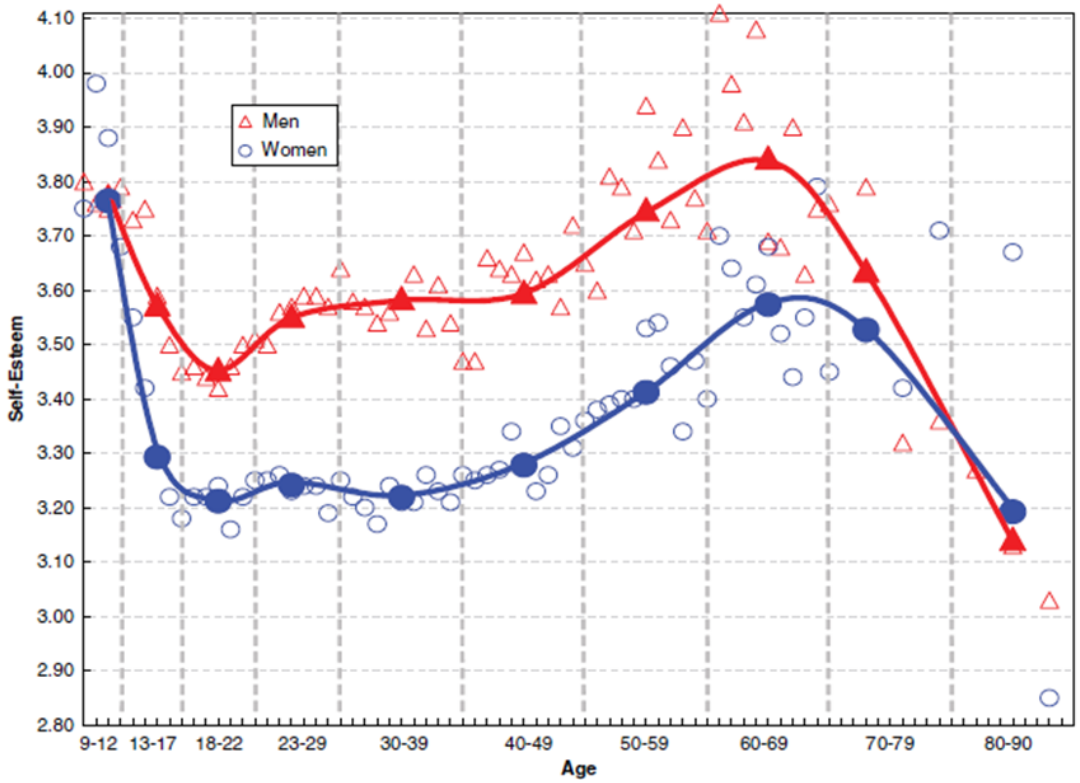


Figure 1: Mean level of self-esteem for males and females across the lifespan. Also, year-by-year means, separately for males (open triangles) and females (open circles).

The strategies to overcome a lack of self-confidence, are therefore an essential part in advancing career progression, since positive attitudes toward abilities are known to predict their successful use (Ehrlinger & Dunning, 2003). Importantly, leadership development is strongly tied to self-confidence with increasing levels of confidence being associated with increased levels of transformational leadership behaviours (Fitzgerald & Schutte, 2010).

Some in society still consider gender differences in self-confidence to be innate. However, hundreds of scientific studies have shown men and women to be equally intelligent and gifted in terms of innate qualities and equally ambitious and driven in terms of learned behaviours (Eagly & Carli, 2007; Shibley-Hyde, 2014). Like ambition and drive, self-confidence is believed to be a learned behaviour that can be trained and developed as much as it can be undermined (Doey, Coplan & Kingsbury, 2014). The origins of self-confidence, like so much learned behaviour, is likely to be in childhood, since these behaviours are already well established prior to beginning a career (Bourdieu, 1990).

Understanding whether young men and women entering the workforce are equally self-confident or not, provides valuable evidence for the kinds of organisational interventions that may be required to address gender differences in confidence in the workplace. If differences in self-confidence are not innate, then it is the environment which is driving them. If boy's and girl's self-confidence coming out of school is the same, then it is our tertiary institutions, workplaces and societal institutions which are undermining women's confidence and interventions should be framed accordingly.

Early life experiences of parental division of labour and inputs from schooling are well known to be determinants of role occupancy in later life (Avolio, Rotundo & Walumbwa, 2009). Additionally, where this division accommodates a working career for a mother and strong female role models, children are likely to grow up with more gender egalitarian attitudes and beliefs (Wetlesen, 2013). Critically, Evans and Diekman (2009:235) argue that assignment of gender roles in childhood 'lead[s] people to endorse gender-stereotypic goals, which then lead to interest in occupations that afford the pursuit of these goals.' For example, in recent studies, despite low numbers of girls undertaking math, science or engineering subjects, girls have no less aptitude for these subjects. Rather they form attitudes towards their suitability to undertake such subjects, or careers related to these subjects, based upon input from parents, teachers, friends and the media (Buday, Stake & Peterson, 2012; Else-Quest, Mineo & Higgins, 2013).

Additionally, men are more likely than women to overestimate their ability to fulfil roles with which they are unfamiliar (Steinmayr & Spinath, 2009). Events in childhood around the ability to take risks, and to be successful, promote self-confidence in males around risk in later life (Hoffman, 1972). Likewise, other studies have shown that differential treatment of boys and girls in traditional Western society regarding the limitation of some forms of play in childhood and differential adult supervision of these activities, promotes less self-confidence and self-esteem for women later in life (Pallier, 2003; Sahlstein & Allen, 2002; White, Cox & Cooper, 1992), thereby firmly pointing the finger at gender differences in self-confidence commencing in childhood. Additionally, shyness is more socially acceptable for females, reinforcing this behaviour at the expense of self-confidence or assertive behaviours (Doey, Coplan & Kingsbury, 2014).

Facebook COO Sheryl Sandberg (2013) has attributed the stall in female career progression to a reluctance by women to 'lean in' or in other words to take risks or opportunities as they arise. In this case, gendered personality traits established in childhood may be acting to produce disadvantages for women in judgments of their ability to accept or apply for promotion opportunities in the workplace (Guay, Marsh & Boivin, 2003). Catherine Fox (2017), however argues that it is not innate or necessarily childhood-driven gender difference in confidence which account for the lack of women's progress, but rather male ways of working and organisational structures supporting these which are to blame.

It is worth noting that most measures indicate that there are few appreciable psychological differences between men and women (Hyde, 2014). As Eagly, Beall and Sternberg (2004:22) note:

'...while there are some moderate differences in some specific cognitive abilities ... most verbal, spatial and mathematical tests, including measures of vocabulary, reading, comprehension, general verbal ability, computational ability and understanding of mathematical concepts show negligible to small differences.'

Therefore, assuming that there is a reasonably high degree of overlap between these cognitive skills and those required by an executive (Wackerle, 2001), such findings indicate that men and women are equally equipped to undertake such roles. Differences in self-confidence are most likely an artefact of gender differential experiences.

A key question answered by this research is whether gender differences in self-confidence arise in childhood under all conditions. If this is not the case, it will provide some evidence that the observed differences in adulthood between men and women's self-confidence can at the very least be partly attributed to interactions with organisational and societal structures which act

to undermine women's confidence, rather than women themselves being innately less self-confident.

The *Hands up for Gender Equality* project explores and extends key aspects of previous theoretical thinking outlined above, through the detailed examination of both general and social self-efficacy (i.e. self-confidence), by examining the activities undertaken and key influencers acting upon girls and boys between the ages of 12-17 in single-sex schools.

Innovative Contributions of this Study

This research project is among only a handful of studies that have specifically addressed the issue of self-confidence formation and gender differences in the confidence of adolescents. Understanding whether these gender differences existed under all conditions was seen as filling a large gap in the knowledge required to address gender inequality in the workplace more broadly, by the Alliance of Girls' Schools Australasia (AGSA) and the Australian Gender Equality Council (AGEC) who asked the AIBE Centre for Workplace Gender Equality to undertake this study.

The study further examined the issue of career intentions and areas of career interest by gender, again AGSA and AGEC wanted to understand where interventions to drive greater participation by women in STEM subjects and careers should be targeted. This aspect of the research project was underpinned with the support of the major provider of in-school electronically assisted career guidance, JIIG-CAL Australia, who generously agreed to allow us to use their questionnaire in the collection of career related data. JIIG-CAL Australia currently survey over 50,000 students per annum using their career guidance software.

The Alliance of Girls' Schools Australasia, who represent girls' schools across Australia and the Pacific, assisted in the formulation of the survey questions and approach of this study, and were interested in understanding how single-sex learning environments effect girl's self-confidence. The research used a cross-sectional study of Years 7–11 students from high performing single-sex schools to gather empirical data to evidence the gendering of career decisions, self-efficacy and leadership. Year 12 students were purposefully omitted from the study primarily because subject decisions and STEM options are determined by senior course selections made at the end of Year 10 and commencement in Year 11.

The schools involved in the research were extremely generous with access to their students given the competition for time in their already busy curricula. The study comprised of 2 electronic surveys using Survey Monkey software, asking over 300 questions (see Appendices 2 & 3) and taking an average of 70 minutes to complete. The 94% completion rate of the surveys was a testament to the schools involved. Most schools made their activities halls available and arranged students in exam conditions to complete the surveys, thus not only helping to ensure a very high completion rate but also that students' responses were their own.

The project is innovative to the extent that findings are applied to a number of suggestions posed regarding the design of possible successful interventions for the development of self-confidence in adolescents. Outcomes from the research primarily inform interventions by schools and parents to develop self-efficacy and leadership capacity in young women and men as well as provide evidence to support initiatives to improve the number of women undertaking STEM subjects. The research further informs society regarding the consequences of gender stereotypes on the establishment of self-confidence and career choices for women. From an economic perspective, STEM degrees are known to lead to careers in more highly paid industries which dominate contributions towards Australia's GDP. STEM graduates are also the pool from which most senior executives and CEOs of our largest companies are chosen. Operational or line roles have been widely reported as being critical in obtaining future executive and board roles and as such, addressing these issues will contribute to addressing the $300 billion annually forgone by the Australian economy (Bowles, 2012; Goldman Sachs, 2011; Lyness & Heilman, 2006; Smith, Smith & Verner, 2013).

Finally, a research project of this nature has never been conducted in Australia or elsewhere in the world and career guidance practitioners, peak bodies representing secondary educators in Australia, schools, parents and children are the ultimate beneficiaries of the findings contained in the report.

Key Findings & Discussion

Psychological research on leadership suggests that self-confidence is a major characteristic of successful leaders (Smith & Foti, 1998). Popper (2004) notes that in the context of leadership, the more important elements of self-confidence are a high internal locus of control and high self-efficacy. Bandura (1995; 1997) defined self-efficacy as an individual's belief in themselves. He stated that it is generated by a greater understanding about themselves obtained through the accurate processing of outcomes from previous experiences.

In a previous study relating to the potential origins of self-confidence in CEOs (Fitzsimmons, 2011), an array of potential sources of self-confidence development activities in childhood were identified. It was found that:

- CEOs had engaged in significant amounts of non-structured play, adventure and exploration of their local environment with friends as children
- they had travelled extensively both nationally and abroad
- they had major involvement, including leadership roles, in team sport
- it was typical for male CEOs to have had the freedom to be away from their homes unsupervised
- all of the CEOs had secured part-time jobs during high school and this was noted as providing them with confidence entering the full-time workforce
- female CEOs in particular had strong female role models employed in fields outside of the home and had worked at chores in the family business.

As shown in Figure 2, the study tested the specific activities identified above, along with a broad range of activities engaged in by adolescents as identified by participating schools and the Alliance of Girls' Schools Australasia, in the formative stages of the research design.

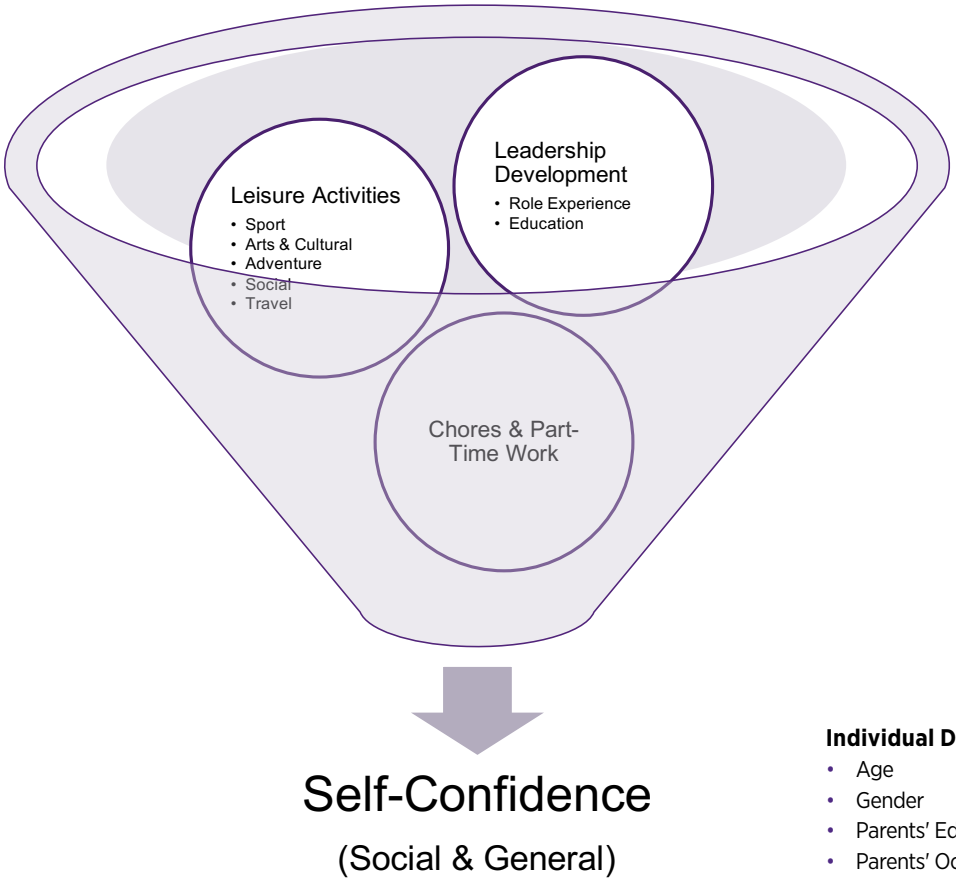


Figure 2: Types of Activities Surveyed

Overview of Analyses

Summarised below are the convergent results of all qualitative and quantitative analyses[i]. The nature of these data means that a range of different tests were completed depending on the question asked, and the response data collected. Where possible, the type of test completed has been specified. Where results are indicated as significant this means that the result obtained could not have occurred by chance at the $p<.05$ confidence level. In other words, we can be sure that the result described will occur 95% of the time in samples of a comparable nature[ii]. Sample characteristics are described within Table 16, see also Table 17 for descriptive statistics related to focal variables.

The individual research questions posed to the students were developed in relation to previous studies related to the understanding of self-confidence formation and of the career trajectories of Australia's top male and female CEOs as well as gendered barriers to career progression (Fitzsimmons, 2011; Fitzsimmons & Callan, 2015). Given the absence of previous studies with boys and girls which explore factors that predict successful leadership appointments (e.g., leadership development activities, self-confidence, activities that link to career domains, etc.) the findings, discussions, recommendations and predictions offered in this report are exploratory in nature [iii].

The results section has been broken into three parts that largely map onto the survey data collected. In the first section, we describe the pattern of effects identified as those that relate to self-confidence, exploring what boys and girls report, the types of activities they engage with that inform their self-confidence beliefs, alongside commentary they provided in outlining their responses. Second, we provide analysis of data as this relates to potential leadership development and career choices in boys and girls. In particular, we examine several curious relationships that emerged between extra-curricular responsibilities (e.g., part-time work, chores of boys and girls, and leadership roles outside of school). Finally, we present data that explores the types of intellectual activities that boys and girls report being engaged with as these relate to career domains within the workplace.

Self-Confidence

Sherer and his colleagues (1982) constructed and validated a 23 item self-efficacy scale which was included as the first item in the first survey instrument undertaken by the students (See Appendix 2). Each of the activities identified above in Figure 2 have been analysed using student responses to this scale. Modifications to the language used in the self-efficacy survey were made using feedback from the Alliance of Girls' Schools Australasia and preliminary testing by focus groups of students in some of the schools participating in the research. These changes were deemed necessary in order for the self-efficacy scale to be suitable for adolescents at the lower end of the age range participating in the study (12 years old).

The questions examine confidence in two ways. Confidence[1] related to social efficacy (e.g., confidence when communicating with others) and measures of general efficacy (e.g., confidence engaging with everyday tasks and living)[iv].

1 "If I can't do a job the first time, I keep trying until I can"; "I am capable of dealing with most problems that come up in life" [General Efficacy or "I am good at working in groups"; "It is difficult for me to make friends" [Social Efficacy]

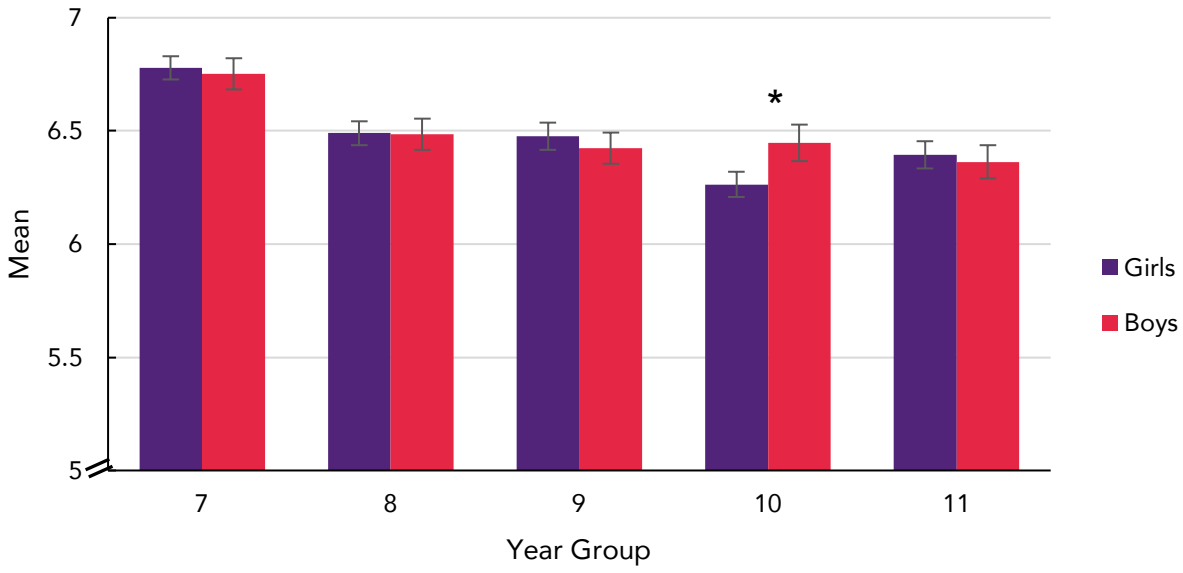
On the basis of past research exploring leadership development activities of men and women CEOs in Australia (Fitzsimmons, 2011; Fitzsimmons & Callan, 2015), we anticipated that the types of activities surveyed (see Figure 2 above) might predict the self-confidence reported by students. In particular, we were interested to interrogate the often-cited differences in confidence women purportedly exhibit within the workplace, and explore whether confidence changes for girls over time spent at school, relative to boys and on the basis of different activities completed during schooling (e.g., leadership responsibilities, extra-curricular activities, etc.). As noted above, childhood leadership development activities and their resulting self-confidence outcomes, remain under-explored within the broader literature[v].

Overall Confidence

Overall confidence was evaluated by combining both measures of social efficacy and general efficacy to provide a 23-item scale which the students undertook (see endnote iv for scale composition information). When results from the application of both of these scales were combined and averaged to provide an indication of overall confidence between boys and girls in the sample cohort[vi], the study found that **overall self-confidence was not significantly different between boys and girls in single-sex schools**[2]. This means that when boys and girls were asked to indicate the extent to which they felt confident engaging in social discourse or engaging with new activities or tasks, there was no statistical difference in the extent to which adolescent boys and girls felt they would be able to undertake or achieve such tasks.

When we analysed the results of overall self-efficacy across the year levels (7–11) we found evidence corroborating earlier findings (see Robins et al., 2002) that, on the basis of personal growth throughout higher schooling, there were significant differences between the year levels (age) in the extent to which they reported overall self-confidence[3], there is a clear decrease between Years 7–11 in overall self-efficacy. We found that **as adolescents get older (regardless of gender) their self-confidence declines**.

On closer inspection of the differences between boys and girls within each year level, we identified one significant difference[4]. Depicted below in Figure 3, when the interaction effect between age and gender was inspected more closely, this appears to be driven by a significant difference between boys and girls in Year 10 when measuring overall self-confidence, as evidenced by the notable difference in confidence interval (highlighted by the asterix). For all other year levels girls were slightly, though not significantly, higher in overall confidence than boys.



Note: Original scale is 9-point Likert. Graph has been truncated for visual inspection.

Figure 3: Overall Efficacy as a Function of Year Level and Gender

2 Gender: F (1,9290) = .45, p = .503: boys (M = 6.49; CI95 6.462, 6.526) did not outperform girls (M = 6.48; CI95 6.455, 6.505) on measures of overall efficacy.
3 Year level: F (4,9290) = 53.79, p <.001: Year 7 = 6.77, CI95 6.723, 6.808; Year 8 = 6.49, CI95 6.444, 6.530; Year 9 = 6.45, CI95 6.404, 6.496; Year 10 = 6.36, CI95 6.306, 6.404, and; Year 11 = 6.38, CI95 6.331, 6.426.
4 Gender x Year level: F (4,9290) = 3.89, p = .004.

General Efficacy

General efficacy was examined using a 17-item scale (see Appendix 4 for full item list). Results show that there was no significant difference between boys and girls in our cohort in their self-reported general efficacy[5]. However, when data were analysed for differences in general efficacy between each year level, significant differences were observable[6]. The pattern observed when we collapse across gender for each year level is suggestive of an overall decline in general efficacy (e.g., with each year progression, students seemingly report less general confidence). Moreover, when examining the general efficacy of boys and girls at each year level, there were also significant differences[7] which have been highlighted in Figure 4 below. As illustrated, there is a significant difference between boys and girls in Year 10 in their self-reported general efficacy.

The study is unable to offer any definitive explanation for this slight, though significant, difference between genders in general efficacy in Year 10. We note however that the surveys were conducted at the end of Term 3 and the beginning of Term 4 when exams and critical assessment pieces are due. The results of these exams and assessments will inform critical decisions regarding course selections for Years 11 and 12 as well as decisions as to whether to pursue a degree related qualification or otherwise. Such decisions may have impacted more greatly upon girls than boys for this one time period. This is a particularly plausible explanation when looking at the broader effects evidenced throughout this dataset which suggest job futures (e.g., activities / preferences and interest levels) are rated more highly by girls in our sample. Perhaps girls in our sample at this point in time are recognising the importance of choosing the 'right' subjects for their senior schooling and identifying the impact this has on career trajectories.

The inherent angst that comes from considering future possibilities may translate into feeling less security in their own knowing and doing relative to other year levels where the salience of current choices resulting in future outcomes is less apparent. Relative to boys, perhaps the girls' schools we surveyed may be more emphatic on the implications of these choices in Year 10 and particularly at the time data was being collected, though this is merely conjecture without substantiation at this point.

Social Efficacy

The general rhetoric surrounding the differing communication capabilities of boys relative to girls (e.g., "girls are less confident in 'speaking up' and asking for opportunities") does not bear out within the quantitative data collected (See Figure 5 below).

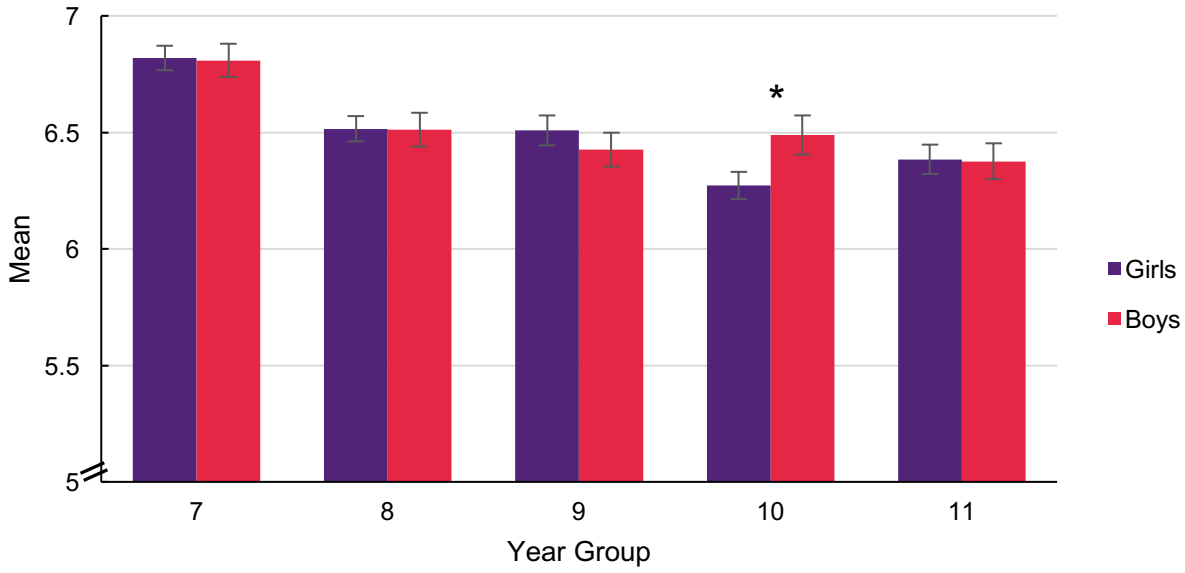


Figure 4: General Efficacy as a Function of Year Level and Gender

5 Gender: F (1,9290) = 1.05, p = 307: boys (M = 6.52; CI95 6.489, 6.557) did not outperform girls (M = 6.50; CI95 6.475, 6.527) on measures of general efficacy.
6 Year level: F (4,9290) = 58.15, p <.001: Year 7 = 6.82, CI95 6.771, 6. 859; Year 8 = 6.51, CI95 6.469, 6.559; Year 9 = 6.47, CI95 6.420, 6.517; Year 10 = 6.38, CI95 6.330, 6.433, and; Year 11 = 6.38, CI95 6.332, 6.431.
7 Gender x Year level: F (4,9290) = 4.82, p = .001.

When examined across Years 7–11 by gender, **there were no significant differences between girls and boys on indicators of social efficacy at any year level from single-sex girls' schools**[8]. That is to say, boys and girls feel equally confident engaging in dialogue with others in social situations at all year levels sampled. This suggests that any 'differences' that might be perceived (and hence inform general rhetoric surrounding boys and girls differing social confidence) may stem from stereotypical beliefs about the competence gap between girls' and boys' communication abilities as opposed to any real difference (see these points made by Eagly & Carli, 2007).

The downward trend between Years 7–11 observed on general efficacy (when collapsing across gender) does not emerge on social efficacy with age related differences seeming to stabilise from Years 9–11. This may indicate that while adolescents are discovering more about their general abilities and limitations, their ability to socialise and their confidence in this ability has formed and stabilised in both boys and girls equally by Year 9. This result stands in contrast with meta-analyses of studies conducted into self-esteem in adolescents (Bleidorn et al., 2015) in two ways. Firstly, previous studies do not show this plateau related to social self-efficacy and secondly, all previous studies show that this decline is significantly more marked for girls than boys. We hypothesise that the single-sex nature of the sample around the influence of boys and perhaps male modes of working, has potentially mediated the effects on girls' self-confidence, allowing self-confidence for boys and girls to be equal in this context.

Together, these self-efficacy results pose some interesting questions. In particular, what factors combined to drive boys improved self-confidence on general tasks in Year 10 relative to their female peers[9]. Moreover, the results appear to dispel beliefs about the differing social confidence between boys and girls, that purports that boys have 'more confidence and asking for what they want' relative to girls. If girls in single-sex schools are less self-confident on general tasks in Year 10, they have recovered their confidence and demonstrate higher self-efficacy than boys in Year 11. In terms of the ongoing debate about women's confidence in the workplace, we can say that whatever may be causing women to be less confident in the workplace and potentially not 'putting their hand up' for opportunities or pay rises, at least in regard to women who attended single-sex schools, we can say that if they are losing confidence the cause lays in the workplace or society generally rather than any innate gender difference or issues with confidence in adolescence.

Boys' and Girls' Activities and Confidence Outcomes

As noted above, past studies involving Australian men and women CEOs have identified patterns of experiences in childhood that were often self-reported as contributing to the development of self-confidence. This suggests that some activities play a more important role in the development of self-confidence in adolescents. To understand whether this proposed relationship exists within the data collected, we asked students to indicate the types of activities they engage with (e.g., sports, playing musical instruments, riding, board games, etc.) and the amount of time they spent on these activities[10]. Presented below in Figure 6, is the frequency distribution of responses to the possible activities boys and girls reported engaging in. Figures 7 and 8 show the amount of time spent by boys and girls separately.

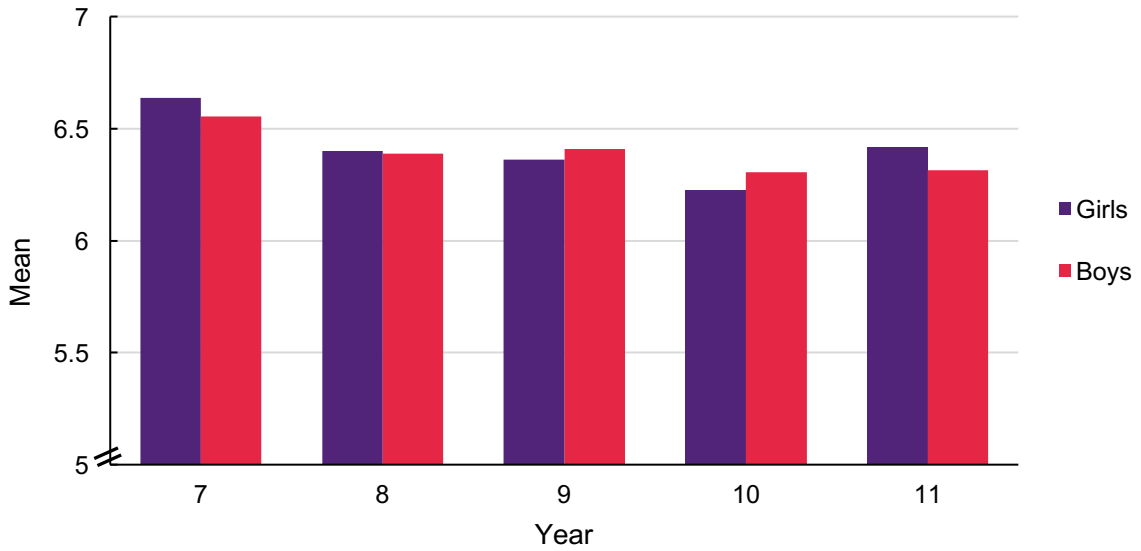


Figure 5: Social Efficacy as a Function of Year Level and Gender

8 Gender: F (1,9290) = .24, p = 622: boys (M = 6.39; CI95 6.328, 6.441) did not outperform girls (M = 6.41; CI95 6.373, 6.445) on measures of social efficacy (girls were not more socially astute).
9 Given the nature of our overall efficacy measure, combined with insights from social efficacy analyses (that show no significant differences between girls and boys in Year 10), it is clear that girls' dip in self-confidence on general tasks / everyday undertakings in Year 10 is driving the significant differences identified.
10 Note: the 20 activities listed in the survey were originally coded 1 (No) – 6 (>10 hours). These values were transformed into an ordinal variable where 0 = No time spent on this activity; 1 = 1 – 2 hours; 2 = 3 – 5 hours; 3 = 6 – 10 hours, and 4 = >10 hours.

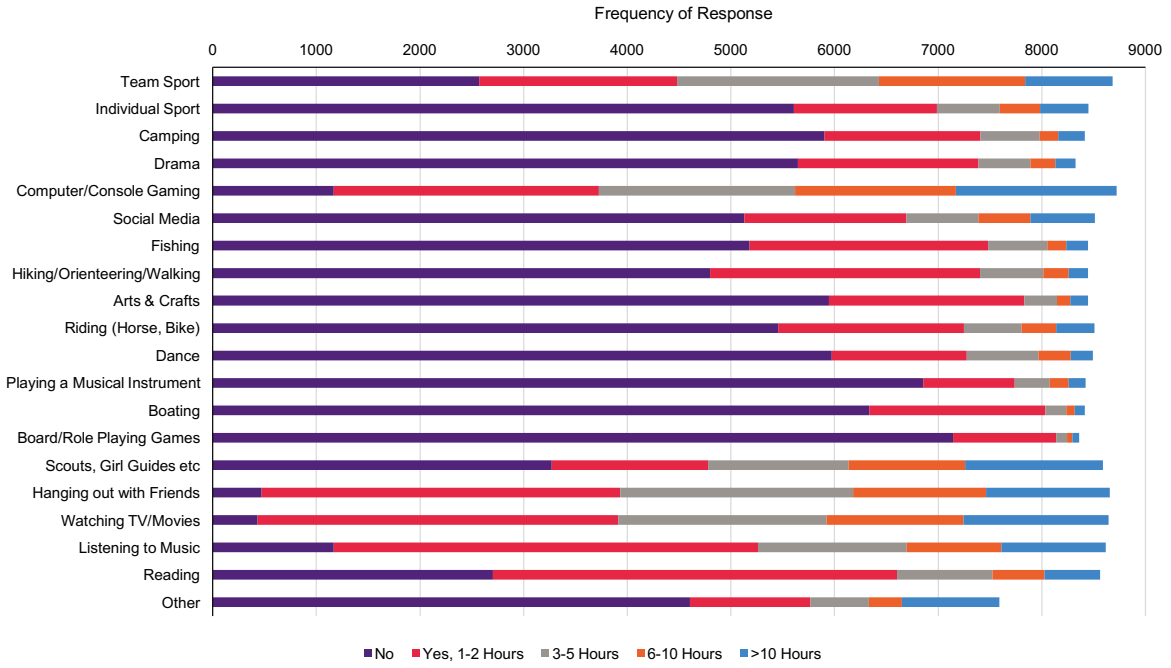


Figure 6: Frequency of Responses to Time Spent on Activities by all Students. Note: N = 6562 – 8720

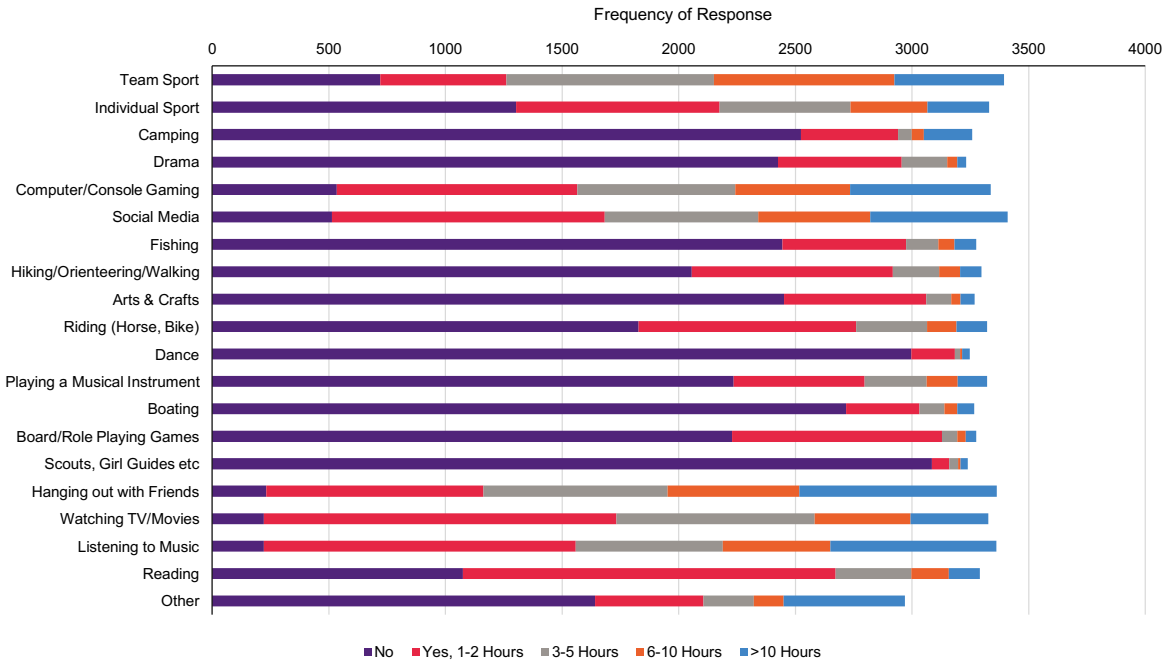


Figure 7: Frequency of Responses to Time Spent on Activities by Boys. Note: n = 2969 – 3409

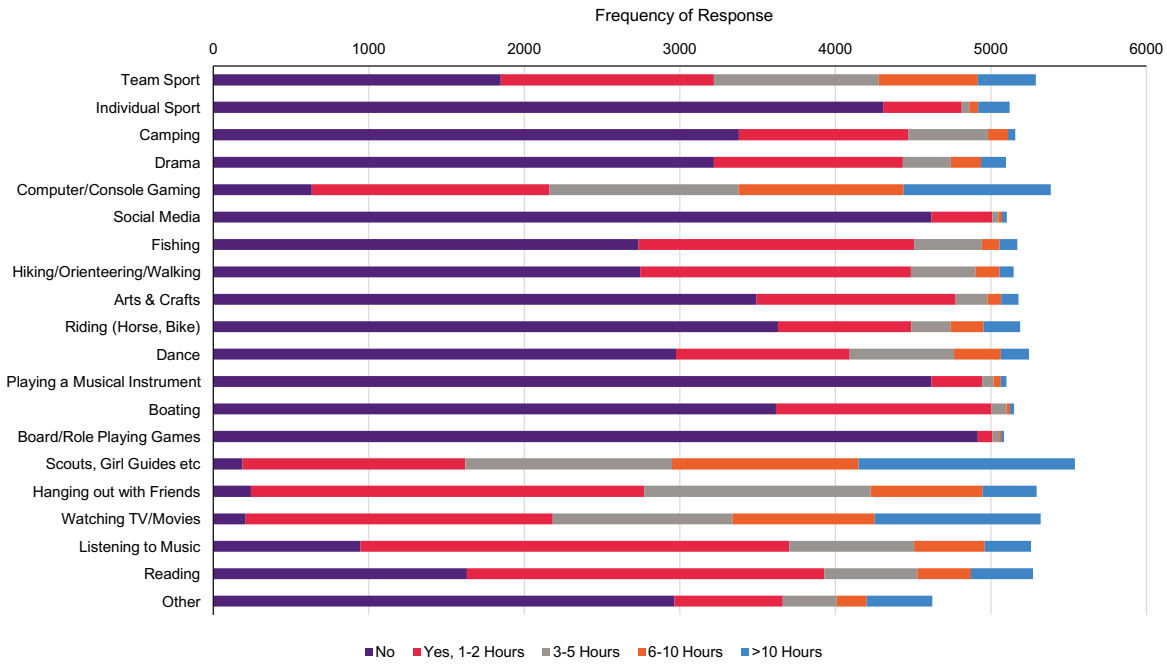


Figure 8: Frequency of Responses to Time Spent on Activities by Girls. Note: n = 4622 – 5383

There were a variety of responses provided with some activities more popular (e.g., computer/console gaming, hanging out with friends, watching TV/movies) relative to other activities (e.g., playing a musical instrument, boating, board games/role playing games). However, what is immediately apparent is that there are large differences in the amount of time spent on certain activities between boys and girls. These roughly fall along a divide between indoor and outdoor activities. Figure 9, below shows the average time spent per week on various outdoor activities. Except for the difference in horse/bike riding, boys are very clearly spending far more time than girls on outdoor activities.

To explore the nature of the relationship between the activities engaged with and self-confidence, we completed a series of statistical tests that show the extent to which changes in activities impact upon self-efficacy outcomes that students report. In this model, we examined the role of several activities (e.g., leadership development/education, those activities listed above in Figure 6, knowing parents careers and education, among others, that students engage with in/outside of school time, along with extra-curricular responsibilities such as part-time work).[vii] Those activities that contribute positively to changes in self-efficacy are listed in Table 1 below by their contribution to either social or general self-efficacy. Those that contribute negatively to the prediction of self-efficacy outcomes are indicated in red italics.

Of the activities modelled for contributions to self-confidence considered in Figure 6, the greatest contribution to boys' and girls' self-confidence was provided by team sport. **In overall terms, with regard to all activities measured in the study, team sport provided the second greatest contribution towards self-confidence**.

Additionally, we were also able to measure the effect of supervised versus unsupervised time spent on activities and the effect this had upon self-confidence. **There was a significant contribution to self-confidence found between unsupervised activities versus those subject to adult supervision**.

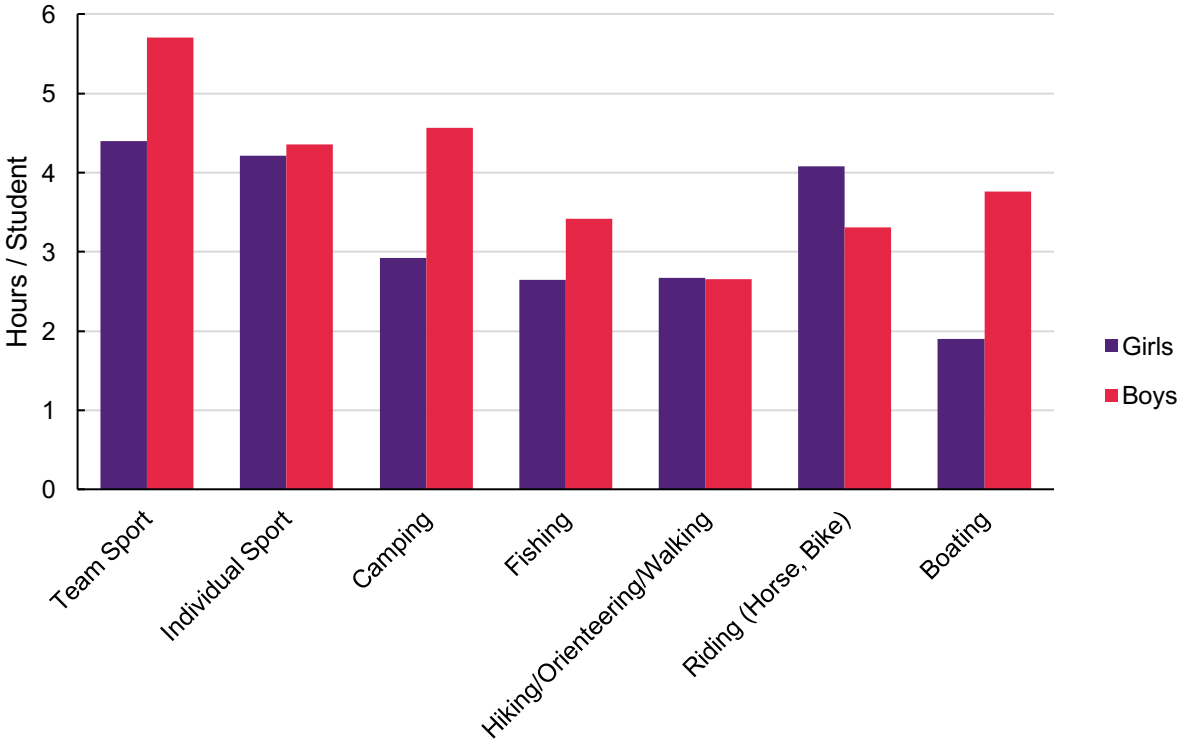


Figure 9: Average Number of Hours per Student on Outdoor Activities[11]

11 The number of hours per student was calculated by multiplying the median hours for each category (e.g., Yes, 1-2 hours = 1.5 hours) by the number of students who endorsed this category response. Then, total hours was summed for each activity, then divided by the total number of students who responded to the activity in question.

Table 1: Activities and Confidence Outcomes

Social Efficacy	General Efficacy
Interstate Travel	Interstate Travel
Intrastate Travel	Intrastate Travel
Team Sport	Team Sport
Leadership Experience	Leadership Experience
Leadership Education	Leadership Education
Scouts/Girl Guides	Reading
Hanging out with Friends	Unsupervised Activities
Individual Sport	Outdoor Chores
Part-Time Work	Individual Sport
Knowing Parents Careers	Listening to Music
Reading	Knowing Parents Careers
	Playing a Musical Instrument
Drama	
Year Level (Decline by Age)	*Computer Gaming*
Dance	*Drama*
Computer Gaming	*Year Level (Decline by Age)*
	Watching TV / Movies
	Social Media Usage

It is worth noting that not all activities contribute towards self-confidence and there are a few which can potentially detract from it. **Overall, Computer Gaming and Social Media Usage were identified as detractors from self-confidence reported by students**.

Leadership

Experience as a Leader

We asked students to indicate whether (and to what end) they had experience in a leadership role. Boys and girl's leadership experience was comparable, with 37.43% of girls indicating they had leadership experience and 38.06% of boys surveyed also reporting leadership experience. Table 2, below, quantifies the number of boys and girls at each year level who report holding a leadership role.

Table 2: Boys' and Girls' Leadership Experience at each Year Level

Age	Gender	Leadership Experience	N
7	Boys	Yes	281
		No	463
	Girls	Yes	465
		No	790
8	Boys	Yes	275
		No	443
	Girls	Yes	400
		No	822
9	Boys	Yes	282
		No	438
	Girls	Yes	361
		No	528
10	Boys	Yes	207
		No	338
	Girls	Yes	376
		No	671
11	Boys	Yes	244
		No	409
	Girls	Yes	397
		No	526

Note: Overall Girls: Yes = 2004 and No = 3350; Boys: Yes = 1297 and No = 2111

Holding leadership roles is an important contributor to future success with past experiences often drawn upon to help solve problems as they arise for leaders. Indeed, Sherer and colleagues (1982: p. 663) state that "... it is suggested that individual differences in past experiences and attribution of success to skill or change result in different levels of generalized self-efficacy ..." It follows that past leadership experience may also contribute to feelings of competence and self-perceived ability to interpersonally relate with others.

To explore whether leader role experience or leadership education supported the development of self-confidence, we completed a series of tests that measured the extent to which the relationships, depicted in Figure 10, below bears out within the data.

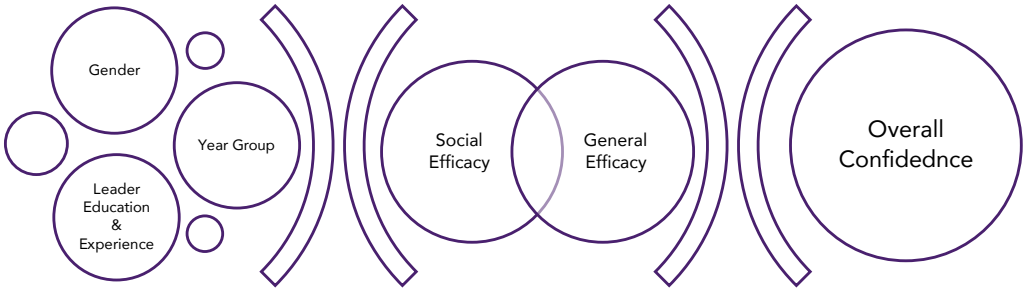


Figure 10: Age, Gender and Leadership Experiences as Predictors of Confidence

When we examined the effects of leadership role experience (or not) and leadership education (or not) on confidence outcomes, for boys and girls Years 7–11, a number of relationships were identified.

Social Efficacy

For social efficacy, there were no significant differences between boys and girls overall, though there were significant differences between year levels (note, this did not translate into differences between boys and girls at each year level).[12] When examining the influence of leadership education and experience, **it was clear that those who had previously held a leadership role enjoyed significantly higher social efficacy relative to those who had no leadership role experience**. This outcome was consistent for those who had past leadership education relative to those students who did not.[13] There were no interaction effects when considering the benefits of leadership education and experience for boys versus girls, or when considering year level at school, nor were there any statistically significant more complex interactions (e.g., for gender x year level x leadership experience x leadership education).

Thus, it appears that social efficacy is positively boosted to the same degree for both boys and girls by leadership courses/education and leadership experiences. Moreover, these benefits do not seem to be any more (or less) beneficial on the basis of year level. Raw data for social efficacy at each year level based on presence or absence of leadership experience is reported below in Table 3.

Table 3: Average Social Efficacy as a Function of Leadership Experience and Year Level

Age	Leadership Experience	Mean Social Efficacy	SD	N
7	Yes	6.92	1.28	733
	No	6.46	1.44	1239
8	Yes	6.70	1.30	668
	No	6.23	1.44	1250
9	Yes	6.65	1.30	634
	No	6.22	1.39	957
10	Yes	6.58	1.28	577
	No	6.04	1.41	1001
11	Yes	6.66	1.25	640
	No	6.18	1.38	932

General Efficacy

When considering general efficacy, the pattern of effects was more complex in nature. There was a significant difference between boys and girls in their general efficacy reported, there were also significant differences between year levels, and this translated into differences between boys and girls at each year level.[14] There were also significant differences in the general efficacy reported by those who had past leadership experience and leadership education.[15] Combined, these results suggest that **leadership roles and courses offer students positive benefits when considering their general efficacy**. Again, the dip in general efficacy reported by girls (see earlier discussion under General Efficacy) was shown to occur in Year 10 related to boys at the same age. However, closer analysis of the average reported general efficacy of boys and girls in Year 11 shows that general efficacy returns to comparable levels. Finally, there was an interaction identified between gender, year level and leadership experience.[16] Provided in Table 4 below are the raw results and these are shown graphically in Figure 11 (below).

12 Gender: F (1,8631) = .41, p = 523: boys (M = 6.40); girls (M = 6.42); Year Level: F (4,8631) = 14.19, p <.001, η^2= .007: Year 7 (M = 6.63); Year 8 (M = 6.40); Year 9 (M = 6.39); Year 10 (M = 6.24); Year 11 (M = 6.38); Gender x Year Level: F (4,8631) = .63, p = 639.

13 Leadership Experience: F (1,8631) = 157.16, p <.001, η^2 = .018: Yes (M = 6.71); No (M = 6.24) and Leadership Education F (1,8631) = 44.44, p <.001, η^2 = .005: Yes (M = 6.60); No (M = 6.29). With regards to leadership education, this was a main effect. In other words, leadership education was positively linked to improved self-efficacy outcomes but this did not differ on the basis of Year level, gender or practice being a leader (e.g., leadership experience).

14 Gender: F (1,8631) = 7.47, p = 006, η^2 = .001: boys (M = 6.53); girls (M = 6.52); Year Level: F (4,8631) = 51.64, p <.001, η^2 = .024: Year 7 (M = 6.83); Year 8 (M = 6.53); Year 9 (M = 6.48); Year 10 (M = 6.36); Year 11 (M = 6.38); Gender x Year Level: F (4,8631) = 3.67, p = 005, η^2 = .002: Girls 7 (M = 6.84), 8 (M = 6.54), 9 (M = 6.52), 10 (M = 6.29) and 11 (M = 6.38) and Boys 7 (M = 6.81), 8 (M = 6.51), 9 (M = 6.43), 10 (M = 6.49), 11 (M = 6.38).

15 Leadership Experience: F (1,8631) = 166.16, p <.001, η^2 = .019: Yes (M = 6.74); No (M = 6.40) and Leadership Education F (1,8631) = 97.71, p <.001, η^2 = .011: Yes (M = 6.68); No (M = 6.39). Much like self-efficacy, the role of leadership education on general efficacy was relatively straight forward: leadership education was positively linked with general efficacy but this was irrespective of gender, Year level and practice as a leader (e.g., leadership experience). Simply learning 'how to' lead others seemed to inform self-confidence beliefs in general.

16 Gender x Year Level x Leadership Experience: F (4,8631) = 2.47 p =.043, η^2 = .001.

Table 4: Average General Efficacy as a Function of Leadership Experience and Year Level

Age	Leadership Experience	Mean General Efficacy	SD	N
7	Yes	7.02	.90	733
	No	6.72	1.00	1239
8	Yes	6.77	.92	668
	No	6.40	1.05	1250
9	Yes	6.70	.95	634
	No	6.33	.96	957
10	Yes	6.62	.93	577
	No	6.20	1.06	1001
11	Yes	6.57	.96	640
	No	6.25	1.02	932

It is clear from Figure 11 below, that the general efficacy of leader girls and boys is significantly higher than that of those girls and boys who don't have leadership role experience. However, the pattern of effects seems more mixed for leader boys. There is a decrease from Year 7–10 irrespective of leader role experience, whereas the downward trajectory of general efficacy (evidenced again earlier within General Efficacy) seems to suggest additional factors beyond those examined here may be impacting upon boys' general efficacy outcomes.

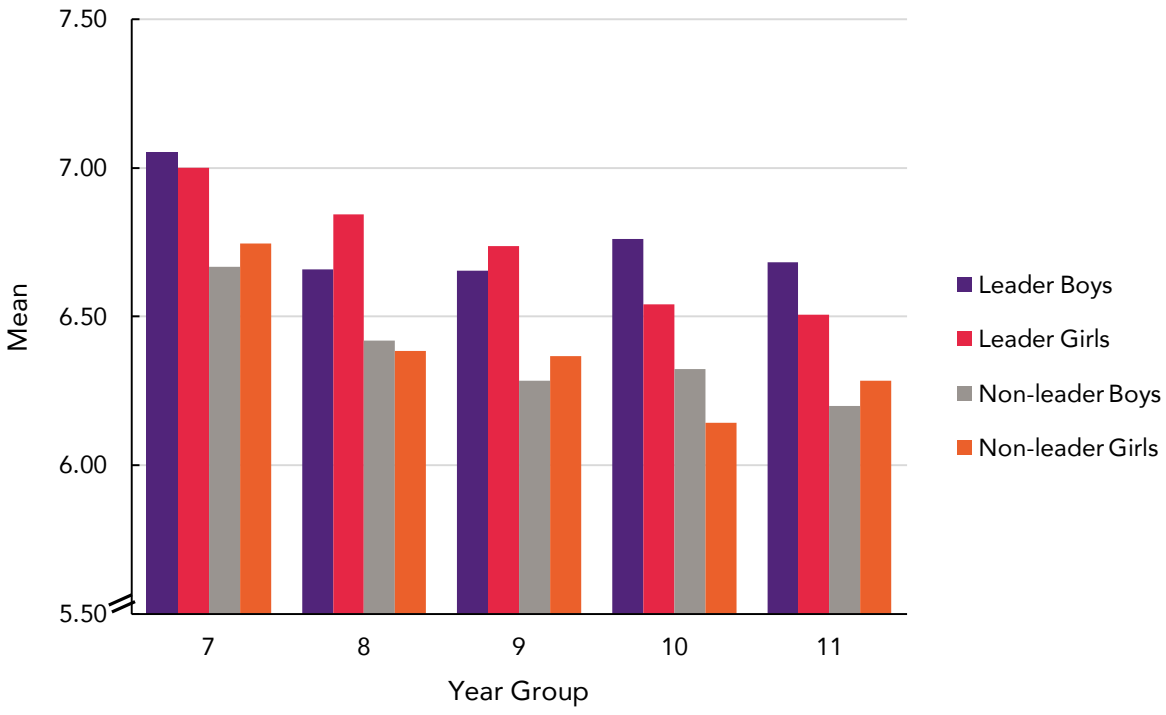


Figure 11: General Efficacy as a Function of Leadership Experience

Nonetheless, when compared to all activities examined in the study towards the formation of greater self-confidence, modelling showed that holding leadership positions and engaging in leadership development activities was the third highest source of self-confidence in both boys and girls.

Type of Leadership Role Experience

We wished to understand how the type of leadership role experience may differ between boys and girls. Within the questionnaire on self-confidence outcomes, we asked students to indicate what type of leadership role they had undertaken. Student responses were broad and varied, though could be coded into the following domains: Sporting Leadership, School Leadership (e.g., prefect roles, committee leadership, etc), Arts Leadership (e.g., music captain, dance captain, etc.) and positions of Extra-Curricular Leadership (e.g., Scouts, SLSC, Club Sport, etc.). Provided below in Table 5, are the domains of leadership that boys and girls reported.

Table 5: Domain of Leadership Experience that Boys and Girls Report

Leadership Domain	Boys	% of Boy Respondents	Girls	% of Girl Respondents
Sporting Leadership	625	54.68%	626	32.52%
School Leadership	368	32.20%	964	50.00%
Arts Leadership	42	3.68%	147	7.62%
Extra-Curricular	108	9.45%	191	9.90%

Note: Total number of students who responded to this question n=3081 which is ~32% of the total sample.

For those students who reported different domains of leadership experience, we investigated the nature of the relationship, particularly the differences between boys and girls on outcomes of confidence (See Figure 12). Tests of mean differences between boys and girls showed there were no significant differences on the various leadership domains for either social or general efficacy. Instead, results demonstrated that there were significant differences *between* the different domains of leadership experience on social-efficacy outcomes (but not general efficacy).[17] Experience leading a sporting team at school, or experience leading within schooling life as a prefect or class captain was linked to greater self-confidence relative to other forms of leadership.

The study examined the number of students who reported undertaking activities without adult supervision given its positive (and significant) contribution to the explanation of general efficacy outcomes.

Domain of Leadership Experience

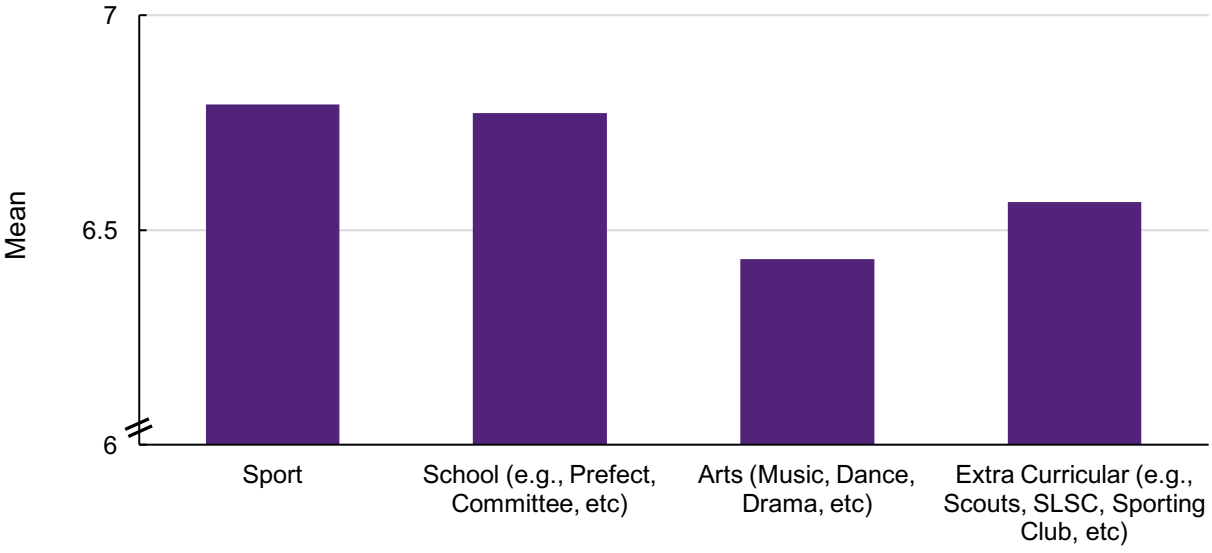


Figure 12: Average Social Efficacy Reported as a Function of Leadership Experience Domain

17 General Efficacy. Gender: F (1,3080) = 2.08, p =.149, η^2 = .001; Domain of Leadership Experience: F (3,3080) = .91, p =.436, η^2 = .001; Gender x Domain of Leadership Experience: F (3,3080) = 2.57 p =.053, η^2 = .003. Social Efficacy. Gender: F (1,3080) = .02, p =.890, η^2 = .000; Domain of Leadership Experience: F (3,3080) = 5.44, p <.001, η^2 = .005; Gender x Domain of Leadership Experience: F (3,3080) = .18, p =.910, η^2 = .000.

Provided in Table 6 below is the number of girls and boys who indicated spending time without adult supervision undertaking activities in their daily lives. Overall, 82.20% of boys surveyed reported engaging in activities that were unsupervised by adults, relative to 79.20% of girls that were surveyed. While there is a slight difference between boys and girls with regard to levels of adult supervision, these figures indicate that relative to past studies (Fitzsimmons, 2011), girls today are being granted more unsupervised time than in previous generations. Nonetheless, it is possible that the difference observed may indicate that boys are still subject to slightly less adult scrutiny than girls.

Table 6: Frequency of Boys and Girls who Report Unsupervised Activities

Gender	Supervision of Activities	N
Boys	Yes	2820
	No	610
Girls	Yes	4234
	No	1114

Note: Total number of respondents: Girls = 5348, Boys = 3430.

Building Responsibility & Leadership Capability in Students

Chores at Home

Chores at home were identified as a key factor that helped to promote the development of skills, capabilities and autonomy in the childhoods of female CEOs (Fitzsimmons, 2011). Importantly, past research has also shown that boys and girls receive disparate pocket money (Westpac, 2015; Heritage Bank, 2015) for these chores. Given the value of chores for childhood development, combined with the inequality in pocket money evidenced in past research, we were interested to explore the types of chores that boys and girls reported doing within their homes.

Our student sample nominated a range of different chores they were responsible for and these included: sweeping, mopping, vacuuming or dusting certain areas of their homes, different aspects of laundry or assisting with home maintenance like mowing, raking or tending to gardens.

Provided below in Figure 13 is the frequency of responses from boys and girls regarding the amount of time they spend undertaking chores at home.

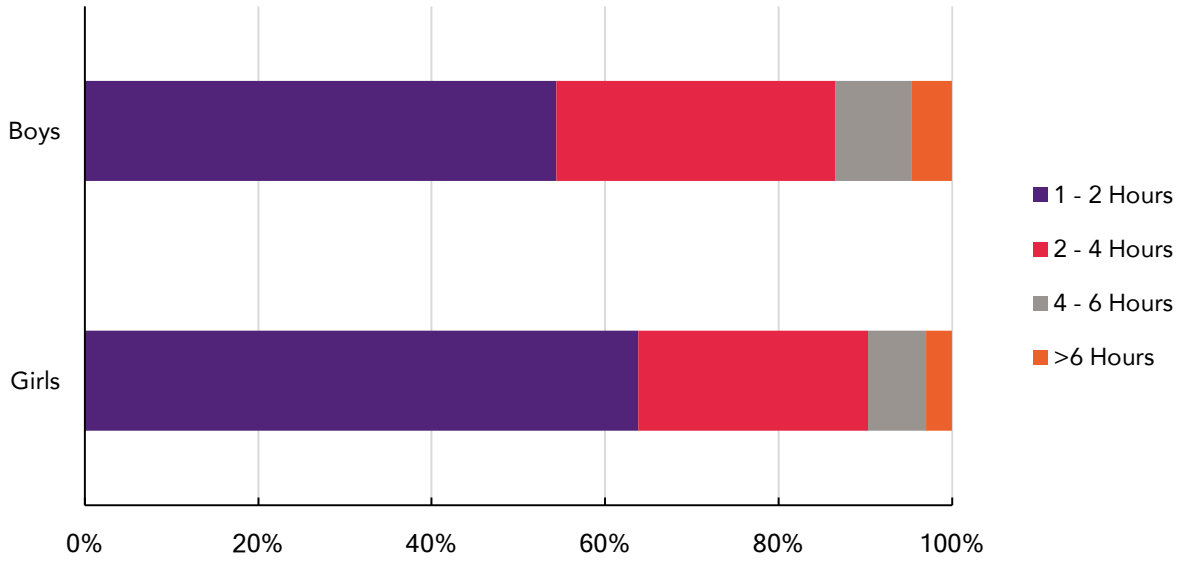


Figure 13: Frequency of Responses to Time Spent on Chores

When we compared the amount of time that boys and girls spend completing chores, there was a clear and significant difference.

Results show there was a significant difference between boys and girls in the amount of time they reported engaging in chores, with boys reporting a greater amount of time spent on chores relative to girls (Girls: M = 1.49; Boys: M = 1.64, see Figure 14).

Noting that these numbers relate to categories of time (e.g., 1-2hrs, 2-4hrs etc.), while we cannot state the exact number of minutes that boys and girls engage in chores, it is clear that boys are spending more time (this is also substantiated by the percentage of boys who reported spending 4-6 Hours and >6 Hours, respectively in Figure 15 below). Combined with the indoor/outdoor disparity discussed earlier, perhaps the outdoor chores that boys are undertaking require greater time dedicated to completion.

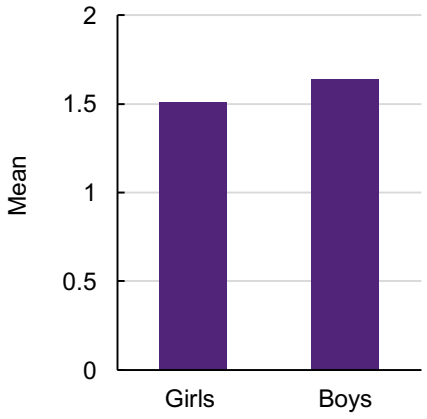


Figure 14: Time Spent on Chores by Students

Figure 15 below, shows that undertaking chores in the home contributes to greater self-confidence in children where they undertake 1-5 hours of chores. The effect begins to decline with 6 hours or more of chores.

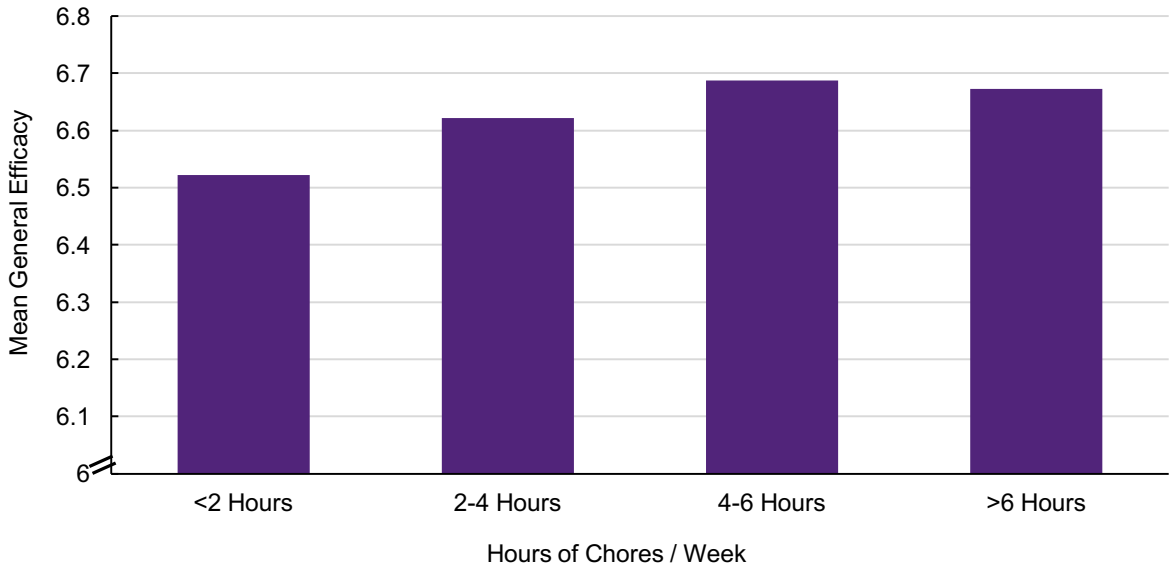


Figure 15: Mean General Efficacy as a Function of Hours on Chores/Week

On balance, there were a range of activities reported by both boys and girls that on first glance seemed equivalent in description. On closer examination however, interesting patterns emerged. When responses were coded with >50% of chores named outside the home (-1) versus >50% of chores named inside the home (1), there was a significant difference observed between boys and girls (See Figure 16). In fact, girls in our sample were significantly more likely than boys to report the majority of their chores being concentrated inside the home.

Interestingly, while the chores boys reported were not necessarily completely concentrated outside (as indicated by the positive valence of scores across the age span), there was a tendency for their responses to include both chores inside and outside the home. This net gender effect is clear in the qualitative responses where boys spoke of chores being focused solely on activities outside the home (e.g., washing cars, cleaning the boat, mowing the lawn, etc.), whereas girls' responses largely contained a majority of indoor activities (e.g., vacuuming, mopping, doing the dishes, caring for siblings, etc.).

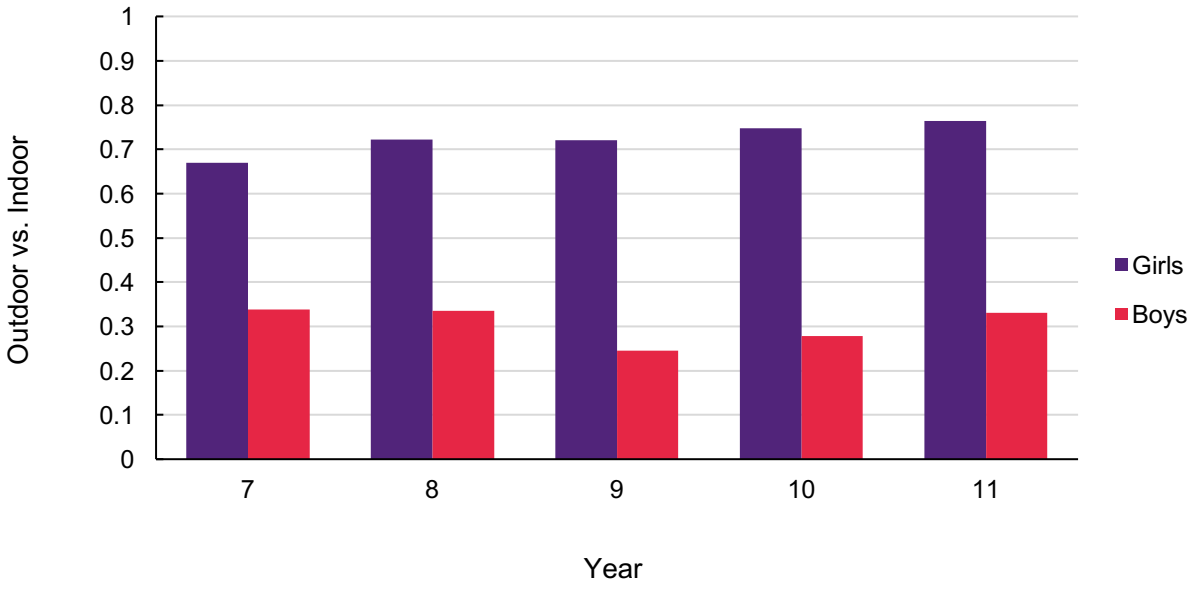


Figure 16: Proportion of Chores Inside vs Outside the Home

This may, at face value, seem like a trivial detail to focus our attention on. However, we know that from much of the leadership literature, and gender role attitude literatures, that internalised beliefs about 'what men should do' and 'how women should behave' do indeed translate into downstream career outcomes via a range of different mechanisms and processes within workplaces. Where boys and girls develop gendered understandings of the tasks and responsibilities that each should engage with through the chores they are assigned during adolescence, this would suggest greater compliance with these gender rules moving into adulthood.

Likewise, coupled with data from the Westpac (2016) and Heritage Bank (2015) pocket money surveys, the identified pocket money gender pay gap of 27% may relate to boys being paid more because they engage in the 'more physical' outdoor chores. Again, this sets up expectations about the value of work and the potentially tacit acceptance of the gender pay gap later in life.

Finally, there was also evidence of an effect of age on time reported undertaking chores. Illustrated in Figure 17, there is a spike in the time spent doing chores for students in Year 8, though this decreased significantly between Years 9 and 10 coinciding with the increasing time and dedication required within senior schooling.

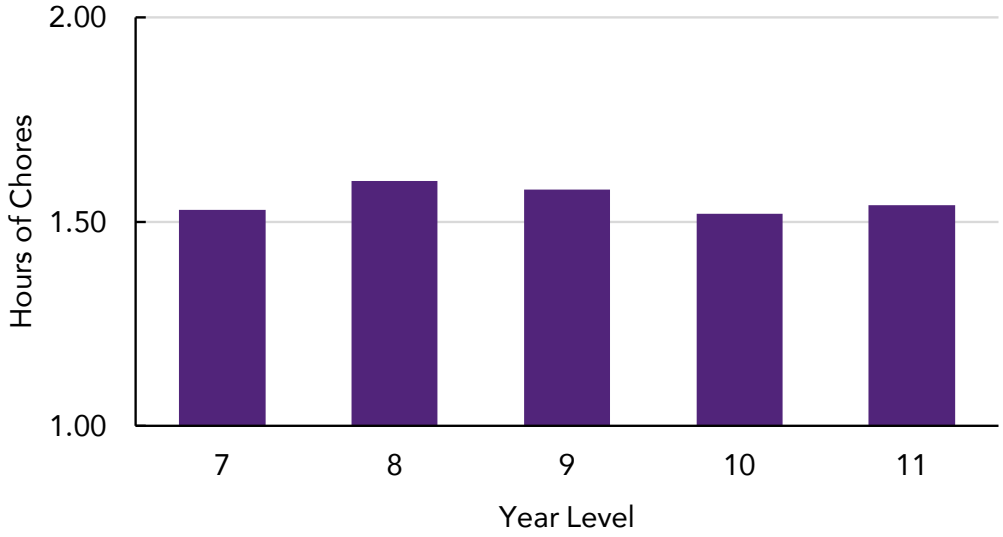


Figure 17: Time Spent on Chores across Years 7 – 11

Time Spent on Studying

The study habits of boys and girls within our sample were also discussed within the survey. Students were asked to indicate whether they had access to a dedicated study space at home (see Table 7 below) and the amount of time they spent studying each week (see Figure 18 below). Overall, 93.20% of girls sampled had access to a dedicated study space relative to 89.20% of boys surveyed.

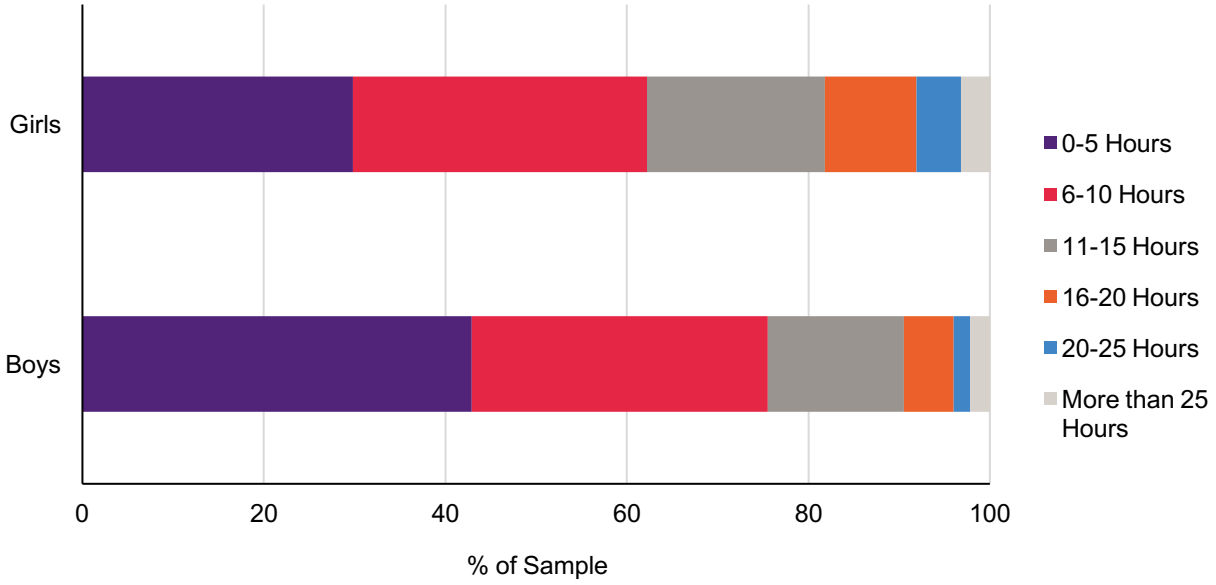
Table 7: Dedicated study space available

Gender	Study Space	N
Boys	Yes	3082
	No	375
Girls	Yes	5049
	No	368

Note: Samples size for Boys = 3457, Girls = 5417.

To understand the differences between boys and girls in study habits, we computed the frequency of responses (see Figure 18.) to average time spent studying by both boys and girls and explored the mean differences between each. Represented below in Figure 18., the results suggest there are differing studying habits between boys and girls.[18]

18 To measure the difference in study habits between boys and girls, responses to the hours of study were treated as nominal data. As a result, we cannot state the difference between boys and girls in hours, however we can show clear differences particularly when evaluating the frequency of responses to each category (as represented in Figure X.). The categories that sit behind our nominal variable are: 1 = 0-5 hours; 2 = 6-10 hours; 3 = 11-15 hours; 4 = 16-20 hours; 5 = 20-25 hours, and; 6=>25 hours.



Sample size: Boys = 3474; Girls = 5438

Figure 18: Proportion of Boys and Girls who Reported Weekly Studying Habits

As shown in Figure 19 (below), **girls spend significantly more time engaged in study than boys at all ages and the difference increases with age**. While the size of the difference is strong, these results are not surprising and align with the proportion of women emerging as degree qualified workers relative to men over the past 40 years. Women have exceeded men in graduating from university since 1985. At present 31.4% of women over 20 years old hold a bachelor's degree or higher relative to only 24.4% of men (ABS, 2018).

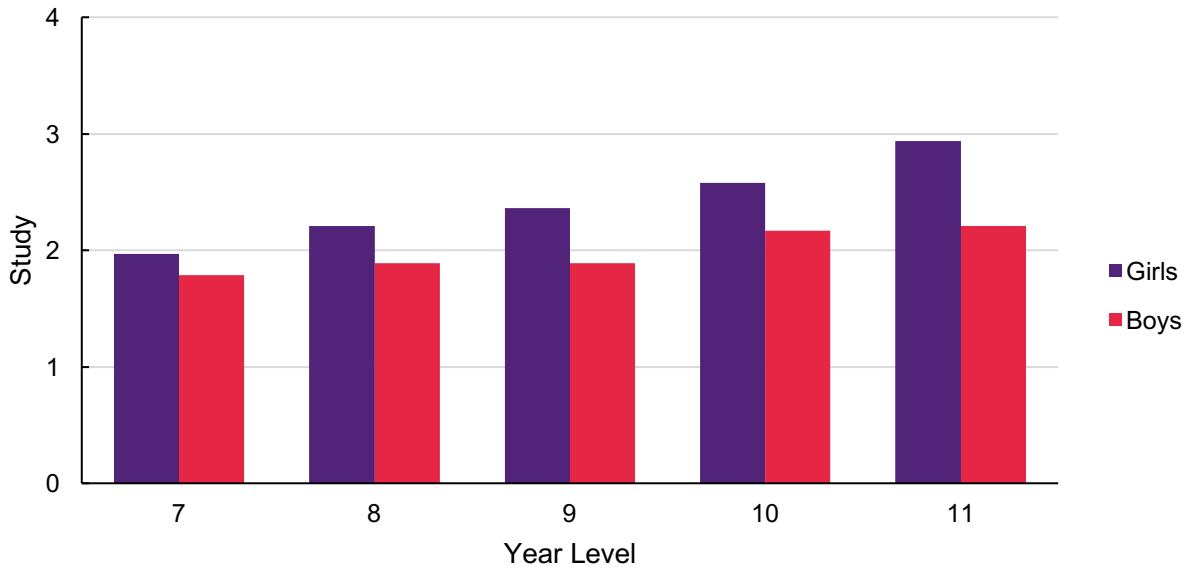


Figure 19: Studying Habits of Boys and Girls at each Year Level

Part-Time Work

Managing part-time work alongside schooling requirements throughout adolescence affords girls and boys the opportunity to develop a wide range of skills and capabilities (e.g., time-management, effectively prioritising of competing demands, inter-personal skills, knowledge of the work environment etc.). We identified that when students hold a part-time job, they are significantly more socially confident relative to their jobless peers[19]. That is to say, having a part-time job informs the extent to which students are able to work in a team, interpersonally relate to others and make new friends, for example.

Importantly, **the positive benefits of part-time work on social confidence were consistent for boys and girls across all ages**. Overall, having a part time job was more important to social confidence than were age related developments in social confidence. Nevertheless, Table 8 below, shows that having a part-time job was less common for this sample overall with the majority of students not engaging in part-time jobs outside of school.

Table 8: Average Social Efficacy for Part-Time Job Holders

Age	Part-Time Job	Mean	SD	N
7	No	6.63	1.40	1855
	Yes	6.67	1.36	168
8	No	6.37	1.43	1737
	Yes	6.61	1.30	249
9	No	6.32	1.37	1235
	Yes	6.60	1.33	393
10	No	6.19	1.40	1076
	Yes	6.36	1.35	527
11	No	6.25	1.37	914
	Yes	6.54	1.31	671

Note: This table is entirely for illustrative purposes. There were no significant differences in social efficacy outcomes on the basis of age. There was a positive net effect of having a part-time job on self-efficacy outcomes reported.

The net positive effect of having a part-time job (vs. not) on social self-efficacy evaluations is represented in Figure 20 below. Importantly, we recognise that not all students may have the opportunity to engage with part-time work. Nevertheless, there remains some relationship between social efficacy and part-time work that if replicable in alternate contexts, may offer adolescents supplementary pathways to growing their skill base and confidence here.

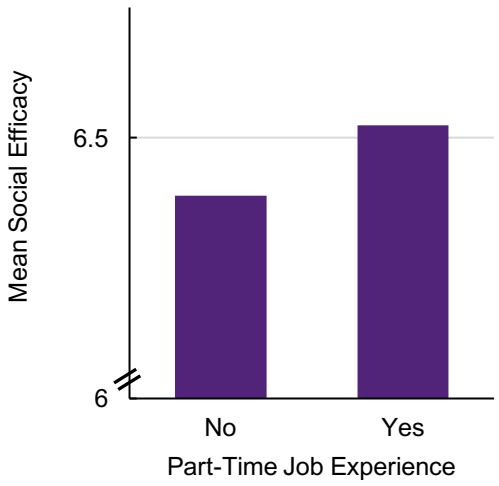


Figure 20: Social Efficacy as a Function of Part-Time Work Experience

19 Students who held part-time jobs also reported higher overall efficacy however this effect was largely driven by social efficacy improvements (by virtue of this being a composite measure). Within the model tested, we obtained the following results on the measure of Social Efficacy, Gender: F (1,8823) = .37, p = 544, η^2 < .001: boys (M = 6.41); girls (M = 6.43); Year Level: F (4,8803) = 7.76, p <.001, η^2= .004: Year 7 (M = 6.63); Year 8 (M = 6.40); Year 9 (M = 6.39); Year 10 (M = 6.25); Year 11 (M = 6.37); Part Time Job: : F (1,8823) = 25.51, p< .001, η^2 = .003: Yes (M = 6.52); No (M = 6.39). No significant interaction effects identified.

Travel (State, National and International)

Travel of all types is an important contributor to broadening cultural awareness, independence and problem solving for adolescents (Gardiner & Kwek, 2017). We asked boys and girls within our sample to indicate the extent to which they had travelled within Queensland, throughout Australia and internationally. Results show that the larger portion of our students had travelled recently, though girls reported travelling nationally and internationally, more than boys and these differences were significant (see Table 9 below)[20].

As discussed above, the study also modelled the relative contribution of each of these activities towards the formation of self-confidence. **Of all of the activities examined, intra and inter-state travel, both in the form of excursions and family holidays showed the greatest positive effect upon self-confidence**. It is likely that intra-state travel, particularly on family holidays allows a high degree of unsupervised freedom to explore new environments and meet new people. These are factors that are well researched as providing positive contributions to the development of self-confidence (Bandura, 1995; 1997).

Table 9: State, National and International Travel Frequency of Boys & Girls

Travel Type	Girls	Boys
Intrastate	91.20%	91.10%
Interstate	74.70%	70.40%
Overseas	59.50%	54.20%

Data were further examined to produce the frequency of responses to each travel type for each year level we surveyed (See Table 10 below). Across the sample of boys and girls, international travel was the least frequent of all forms across all year levels. One noteworthy result is that of Year 11s, of whom 61.90% reported travelling overseas within the past 12 months. This may be a reflection of school-based exchange programs that students take part in or other mechanisms through which students travel overseas (e.g., family, extended family, extra-curricular activities). There is also little doubt that the higher socio-economic demographic represented by top matriculating single-sex school students is a significant contributor to this high percentage.

Table 10: Number of Students by Grade Level and Travel Type

Age	Travel	Intrastate	Interstate	International
7	Yes	1704	1382	1039
	No	172	476	801
8	Yes	1691	1352	963
	No	157	472	838
9	Yes	1377	1085	848
	No	120	386	640
10	Yes	1350	1065	892
	No	150	415	613
11	Yes	1359	1023	928
	No	125	432	572

Across all year levels, intrastate travel was the most common, ranging from 90.00% (Year 10s) to 92.00% (Year 9s) who reportedly travelled outside of Brisbane but within Queensland in the past twelve months. Rates of interstate travel within our sample ranged from 70.30% (Year 11s) to 74.40% (Year 7s). Overseas travel was least frequent, ranging from 53.50% (Year 8s) to 61.90% (Year 11s).

20 This percentage refers to the portion of total valid responses to each question. Interstate: $t(8128)=-4.35$, $p<.001$, boys: $M=.41$, $SD=.91$ and girls: $M=.49$, $SD=.87$; International: $t(8175)=-4.74$, $p<.001$, boys: $M=.08$, $SD=1.00$ and girls: $M=.19$, $SD=.98$.

As shown in Figures 21 and 22 below, different modes of travel were linked with different levels of social and general efficacy reported by students.[21] The effect of travel on social efficacy reported was consistent across boys and girls.

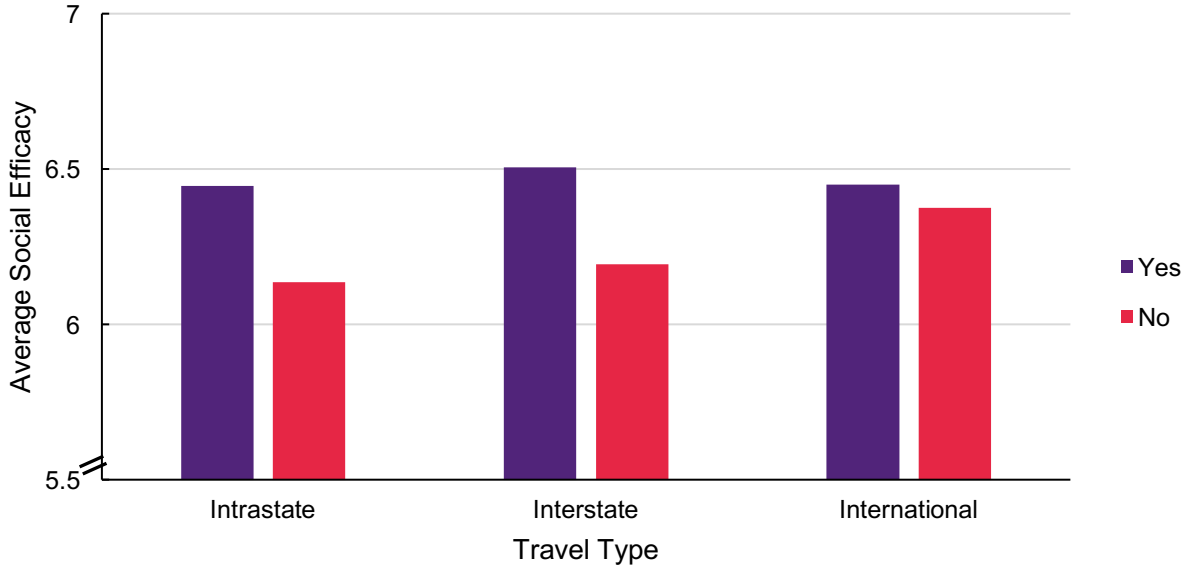


Figure 21: Travel Types and Average Social Self-Efficacy

Figure 21 illustrates the significant differences in social efficacy reported by students who travel intrastate and interstate relative to those students who may travel overseas. This pattern of effects (at least in this particular sample) can be interpreted as suggesting that social efficacy is not boosted by international travel. There were no significant differences in the average social efficacy reported by boys and girls on the basis of different types of travel. This pattern of effects was slightly different for general efficacy that students reported (see below Figure 22).

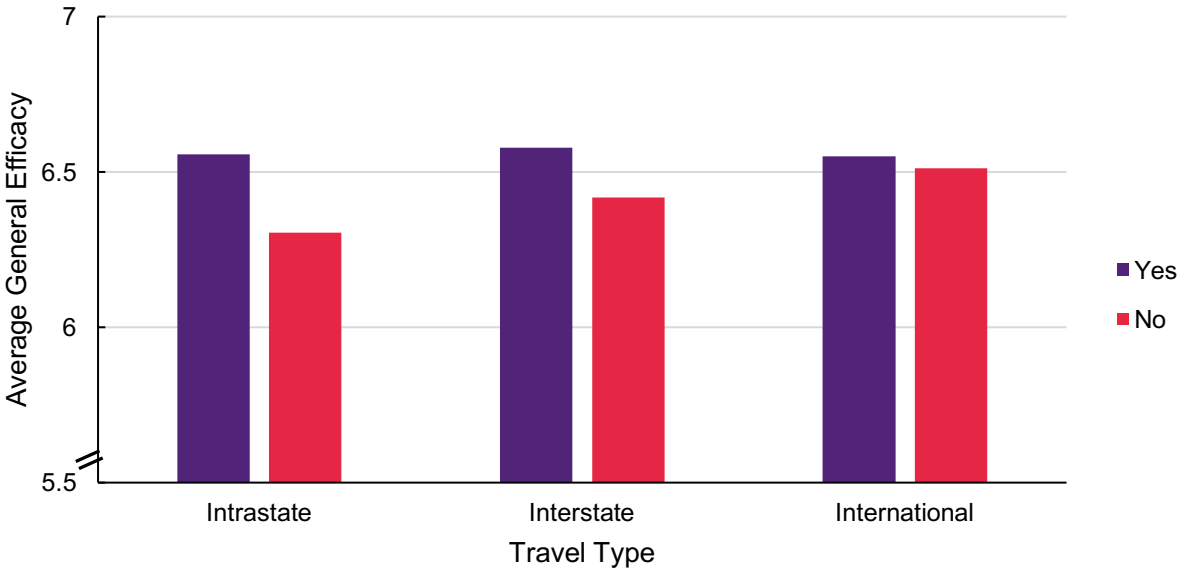


Figure 22: Travel Types and Average General Self-efficacy

21 Social Efficacy, Intrastate Travel: F (1,7563) = 7.49, p = .006, η^2 = .001: Yes (M = 6.45); No (M = 6.14); Interstate Travel: F (1, 7563) = 30.25, p <.001, η^2= .004: Yes (M = 6.51); No (M = 6.20); International Travel: F (1, 7563) = 1.01, p = .316, η^2 < .001: Yes (M = 6.45); No (M = 6.38). General Efficacy, Intrastate Travel: F (1,7563) = 23.93, p <.001,η^2 = .003: Yes (M = 6.56); No (M = 6.30); Interstate Travel: F (1, 7563) = 7.86, p =.005, η^2= .001: Yes (M = 6.58); No (M = 6.42); International Travel: F (1, 7563) = 4.27, p = .039, η^2 = .001: Yes (M = 6.55); No (M = 6.51).

Closer examination of the effects of different types of travel suggest that all three types (intrastate, interstate and international) significantly predict general efficacy outcomes. The third type of travel – international travel – despite being significant, does not reflect the stark contrast evidenced by students who reported travelling intrastate and interstate (see Figure 22 above). When returning to the earlier depiction of overall general efficacy (see Figure 4) the sample average including all boys and girls is consistent with that reflected by international travel above. This considered, we cannot be certain that international travel provides additive benefits to general efficacy to a similar extent that we can with intrastate and interstate travel. This particular result, might be explored further within additional research beyond that presented here.

When looking across both Figures 21 and 22 and considering these averaged as an indicator of overall efficacy in the context of travel, the benefit of students who do travel interstate appears to be larger than intrastate and international.

Careers

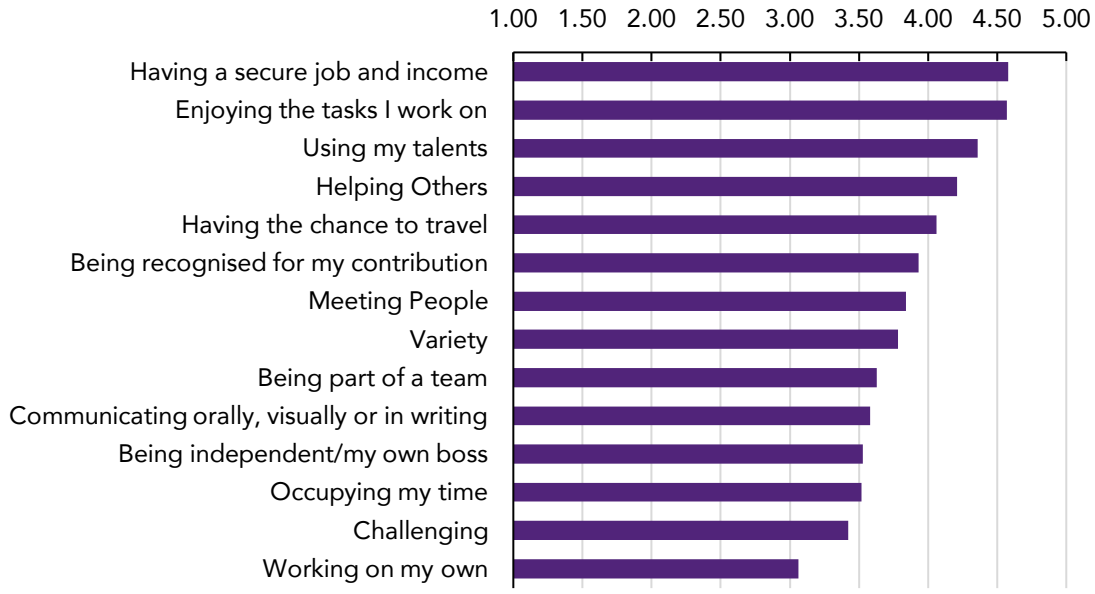
Reasons for Working

Throughout any career, there may be a multiplicity of drivers that inform career choices and reasons for working. To the extent that individuals endorse traditional gender role attitudes (e.g., male breadwinner and female caregiver) it is likely that their reasons for working will also align with these expectations (Eagly & Carli, 2007). In spite of these attitudes being reported in many previous studies, the existing literature has not yet investigated the extent to which boys and girls actually espouse these beliefs in the reasons they provide for wanting to work and to get a job.

We provided students in our sample with the opportunity to nominate their own reasons for working from a possible list of 14 commonly provided justifications (JIIG-CAL, 1993). **The top three reasons for wanting to work which were endorsed by both boys and girls were identical (see Figures 23 & 24)** and were 'having a secure job and income', 'enjoying the tasks I work on' and 'using my talents'. The first important difference between boys and girls arises in the fourth preference. Girls nominated 'helping others', whereas boys recorded this as a lower, seventh placed priority.

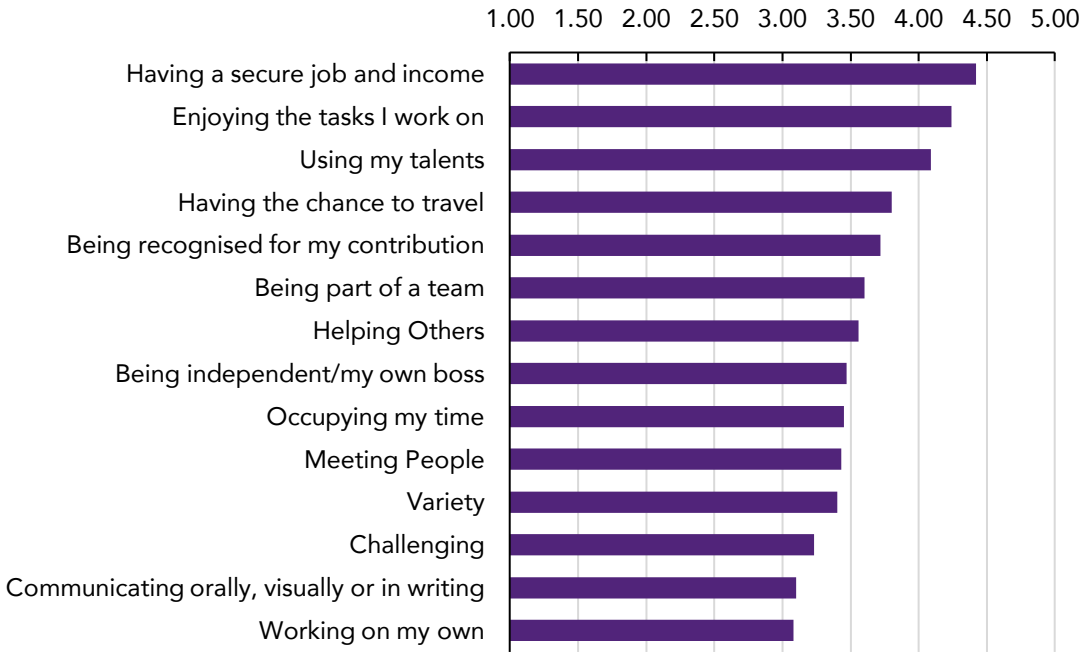
In terms of the dominant reasons for wanting to work, the results appear to stand at odds with claims that men and women have different reasons for wanting to work (Becker, 1985). However, society more broadly still generally associates women with the domestic role which involves child rearing and maintaining the family unit (Hoobler, Wayne & Lemmon, 2009).These caring responsibilities are associated with nurturance, sensitivity, helping and compassion (Eagly, Wood & Diekman, 2000). Therefore, people expect women to have superior social skills and to be involved in occupations congenial to these attributes including, in particular, helping others (Wood & Eagly, 2002). Consultation with AGSA, would suggest that single-sex girls' schools are intentionally teaching their students to understand the gendered world and are encouraged to ignore gender stereotypes and pursue any career they want. With this in mind, we might expect an alternate pattern of effects in co-educational learning contexts or contexts where there is less emphasis on the rejection of a gendered world. Such a hypothesis remains to be tested in the future.

People become accustomed to seeing differences in the tasks undertaken by men and women and they are often transformed into widely shared beliefs that come to form the cultural status quo (Cejka & Eagly, 1999). Women receive societal approval when they act stereotypically and this in turn bolsters their traditional obligations. Conversely, awareness of a stereotype and concern about fulfilling it can interfere with a person's ability to perform tasks that are contrary to the stereotype's views and therefore add further barriers to career progression (Jackman, 1994; Schmader & Johns, 2005). Such a difference, though only in the fourth order score, may go some way to explain gender differences in career preferences and activity priorities explored later in this report.



Note: Scale anchors are 1 (Not at all important to me) and 5 (Very important to me)
Figure 23: Average Value Placed on Reasons for Working from Girls

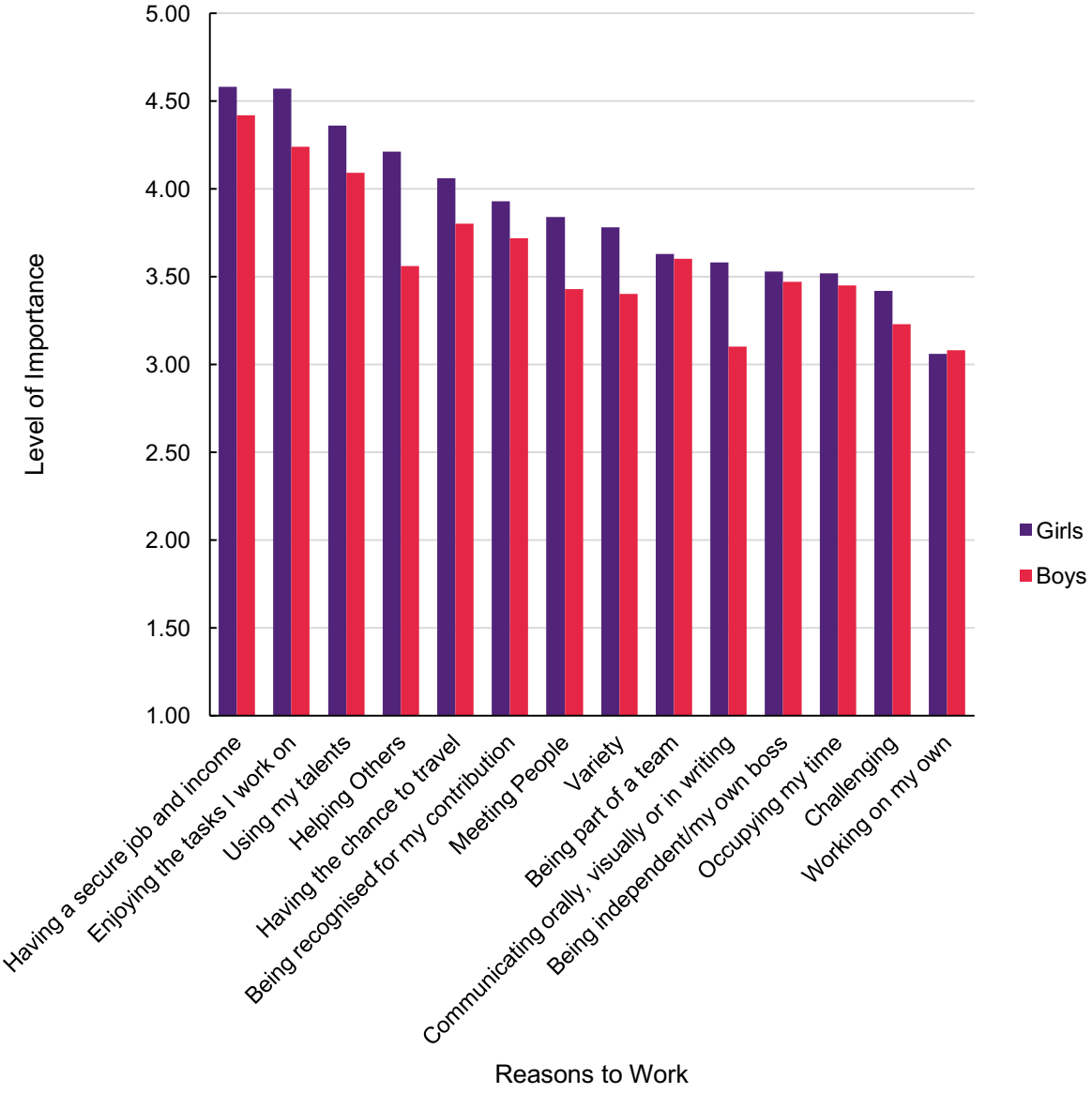
We computed the same mean scores for reasons to work that boys in our sample nominated. These are provided below in Figure 24.



Note: Scale anchors are 1 (Not at all important to me) and 5 (Very important to me)
Figure 24: Average Value Placed on Reasons for Working from Boys

Below 'Helping Others' boys and girls reverted to identical preferences for the next two choices 'Having a chance to travel' and 'Being recognised for my contribution'. Considered together, these reasons for working largely converge on notions of autonomy and professional fulfilment for both girls and boys. These findings remain in line with those discussed by Eagly and Carli (2007) which highlight that beyond considerations of family, men and women report virtually identical reasons for wanting to work and their commitment to employment.

Based on these responses, and the emphasis that boys and girls both place on having autonomous and fulfilling careers, we were interested to understand whether the emphasis that boys and girls each placed on these reasons differed significantly. In other words, do girls or do boys think that (for example) "having a secure job and income" is important? To do this, we compared mean scores using a series of t-tests for boys and for girls on each of the fourteen reasons. Provided below in Figure 25 is the outcome of this analysis.



Note: Scale anchors are 1 (Not at all important to me) and 5 (Very important to me)

Figure 25: Mean Differences Between Boys and Girls on their Reasons for Working

There were only two reasons to work that boys and girls **did not** show significant differences on. These were "*being part of a team*" and "*working on my own*"[22]. All other reasons to work were evaluated differently by boys and girls. Girls emphasis on the reasons to work relative to boys is significantly higher. Of particular interest, is the significant difference between boys and girls on the reasons linked with autonomy and agency (e.g., "having a secure job and income", "being recognised for my contribution", "being independent/my own boss") and on job fulfilment (e.g., "enjoying the tasks I work on", "using my talents" or "challenging"). Relevant to the gendered nature of work, girls also reported greater emphasis on reasons to work that were consistent with altruism and collaboration with others (e.g., "helping others" and "meeting people"). In isolation, endorsement of these more altruistic reasons to work might not be indicative of anything beyond individual preferences. However, the extent to which girls endorse 'helping others' relative to boys, combined with information gleaned on the career domains questionnaire, may provide some insight into the ways that girls draw on these reasons to work when selecting careers as seen above.

As noted above, a significant finding is that **girls have significantly stronger responses to the reasons for wanting to work on nearly all of the fourteen responses**. While we can only speculate about what this effect may relate to, it is a feature of high performing girls' schools that the messaging surrounding the importance of work and entering the workplace is emphasised. It may be that this message about the value of work has been an everyday one for boys in line with the traditional 'male bread-winner' model and as such, being an expectation, does not drive similar communications in boys' schools.

Influencing Factors on Career Development

While career development can be influenced by abilities, interests and motivation, there are also external factors that can influence students. From 18 possible influencing factors (e.g., culture, creative attributes, friends, personality, etc.), we asked boys and girls to nominate 5 factors that influence them the most. Provided below in Table 11, is the frequency of boys and girls responses. Of significance is that perceived personality fit for a career came second for girls and third for boys; however, 55.33% of girls rated this as an issue for consideration versus only 42.08% for boys. This may potentially indicate that a self-perceived 'personality match' with gender stereotypical roles may still be an issue for this generation of girls.

Table 11: Factors that Influence Boys' and Girls' Career Development

Influencing Factors	Girls	% of	Influencing Factors	Boys	% of
Parents	4044	79.40	Parents	2454	75.05
Personality	2818	55.33	Friends	1764	53.94
Academic success	2640	51.84	Personality	1376	42.08
Friends	2547	50.01	Academic success	1376	42.08
Location (where you live)	1823	35.79	Location (where you live)	1229	37.58
Job availability	1601	31.44	Job availability	998	30.52
Siblings	1289	25.31	Teachers	893	27.31
Teachers	1242	24.39	Physical attributes	768	23.49
Health	1192	23.40	Health	763	23.33
Creative attributes	1113	21.85	Siblings	728	22.26
Media	1056	20.73	Media	583	17.83
Beliefs	963	18.91	Creative attributes	580	17.74
Internet/Social network	658	12.92	Internet/Social network	580	17.74
Gender	639	12.55	Beliefs	578	17.68
Physical attributes	608	11.94	Culture	402	12.29
Culture	480	9.42	Mentor	185	5.66
Mentor	172	3.38	Gender	184	5.63
Disability	159	3.12	Disability	131	4.01

22 We used a series of t-tests to evaluate whether the mean attributions of boys and girls differed significantly from one another.

Career Domains and Student Preferences

Students' interest in different career domains can be assessed by asking a range of questions that evaluate the extent to which certain tasks or intellectual activities appeal to students. The original scale provided by JIIG-CAL (1993) asks students to nominate between 60 activities and tasks that appeal most vs. least. These tasks are reflective of six career domains, set out in Table 12 below. In the original scale, students are forced to choose between activities which means their responses can be categorised into the different domains that they are deemed as most suited to in later career life. In contrast with this approach, we paired the original career domain statements with a 5-point Likert–scale that asked students to nominate the extent to which the activities appealed from 1 (not at all interesting) to 5 (very interesting).

We were interested to understand whether boys and girls differed in the extent to which they find each career domain attractive, and whether their interest levels fluctuated according to their year level. Provided in Table 12 below, are a number of exemplar questions as they relate to each of the different career domains.

Table 12: Example Items from Career Domains of the JIIG-CAL Career Compass

Technology & Sciences	Calculating flight speeds and planning routes for aircraft
	Designing laser cutting machines
	Solving problems using maths
Biological Sciences & Medicine	Identifying viruses in a lab
	Testing food for harmful bacteria
	Testing people for problems in their eye muscles
Finance & Economics	Estimating how well a new product will sell
	Drawing graphs to show what a company has produced and sold
	Being the manager of a company
Arts & Design	Drawing sketches for new buildings
	Designing postage stamps
	Animating cartoons for films
Social Services & Healthcare	Diagnosing and treating mental illnesses
	Helping families with problems to find houses
	Helping ex-prisoners to stop offending
Language & Literature	Writing reports on public meetings
	Introducing speakers at meetings
	Giving talks and lectures

Descriptively, responses to the career domain questions were ordered in terms of interest levels for girls and for boys. Provided in Figure 27, are the top ten girls' choices on the JIIG-CAL (1993) activities list ordered by level of interest reported by girls overall. The first of which is designing clothes, the second is *planning colour schemes for the interiors of buildings* and third, *being the manager of a company*.

When evaluating the topmost items reported most interesting by boys (see Figure 26 below) as an overall cohort, the highest preference is *being the manager of a company*, while second is *designing and building robot*s followed by the third highest item that boys are interested in being *designing laser cutting machines*. It is noteworthy that both girls and boys had 'wanting to manage their own company' in their top three selections overall.

However, when we examined these questions by year level, by Years 10 and 11, both girls and boys were nominating wanting to manage their own company as their number 1 choice. Nonetheless, it is also clear that **girls' and boys' interests diverge markedly in regard to the kind of activities they would like to engage in as part of their careers** (See Figures 28-37 below). An examination of girl's choices in Years 10 and 11 shows that they are driven by meeting social needs, whereas boy's choices are more about solving technical problems. It should be noted that while interests and motivations for a career may differ between boys and girls, this is not a clear indicator of which university degree or technical qualification they may undertake, but rather an indication of the career domain they are likely to want to pursue.

Supporting this finding is work by (Tran, 2017) which showed that girls in single sex schools feel relatively more free than girls in co-educational schools to follow their abilities. This meant that they were more likely to want to choose to work in traditionally male dominated fields and to undertake male dominated degrees such as those in STEM. However the study was unable to conclude that the commencement of these degrees led women from single-sex schools into STEM careers after graduation.

Moreover, Tran (2017) notes that students contained within the sample from single-sex schools come from families in which parents are more likely to be higher educated and work in science-related careers. For girls, this may translate into greater accessibility of possible role-models (e.g., at home, within peers' family networks, the school community, etc). Nevertheless, coeducational students within this sample expressed more positive attitudes and aspirations for science relative to single-sex school students. Combined, these results are suggestive of some key differences that may warrant further investigation for the schools surveyed within our sample (e.g., do preferences for career domains translate into degree choices and career trajectories more broadly in later life).

What is also striking about the results is that, like the reasons given for wanting to work reported above, **girls expressed more enthusiasm for wanting to undertake each of their top ten choices relative to the boys**. Again, we can only speculate as to the reason for this, however one explanation may be that boys feel they 'must' engage in these kinds of activities as part of the 'male bread-winner' trope whereas girls may feel like they have a genuine choice of actually wanting to do these things.

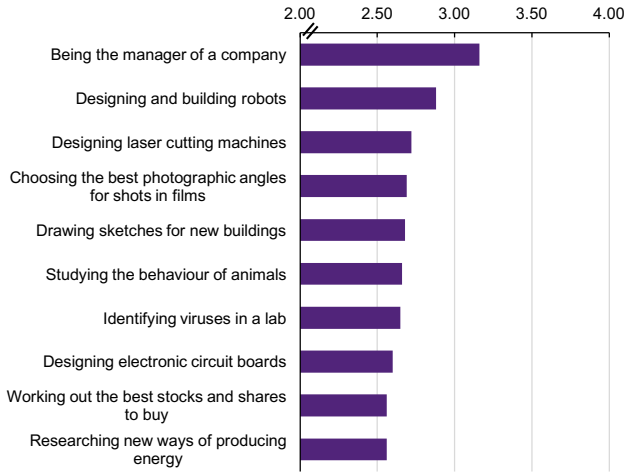


Figure 26: Average Importance of Boys' Top 10 JIIG-CAL Choices (N = 3200 – 3260)

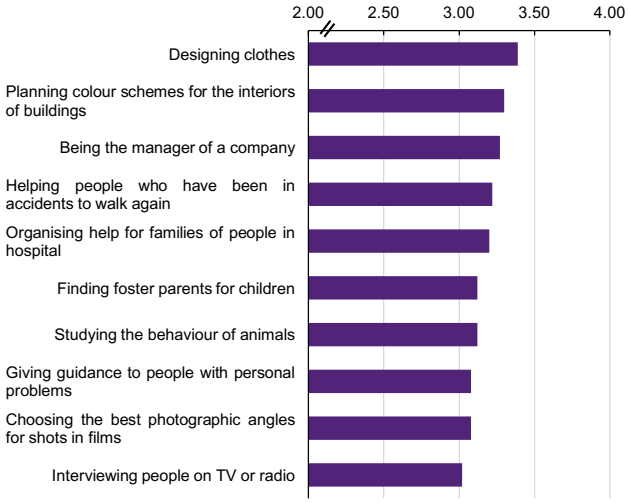


Figure 27: Average Importance of Girls' Top 10 JIIG-CAL Choices (N= 5049 – 5073)

Year 7

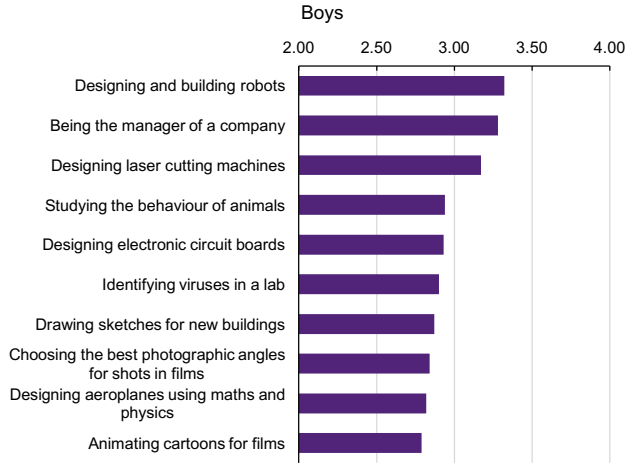


Figure 28: Average Importance of Year 7 Boys' Top 10 JIIG-CAL Choices (n=702-726)

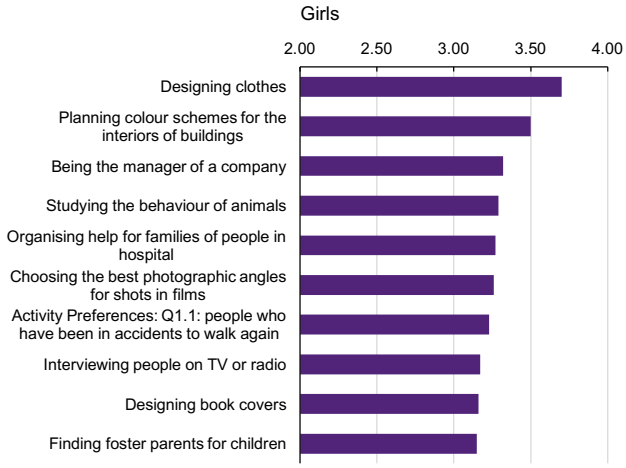


Figure 29: Average Importance of Year 7 Girls' Top 10 JIIG-CAL Choices (n=1163-1200)

Year 8

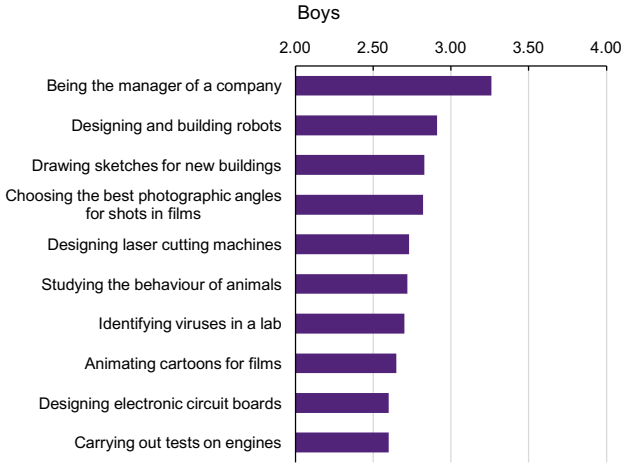


Figure 30: Average Importance of Year 8 Boys' Top 10 JIIG-CAL Choices (n=663-689)

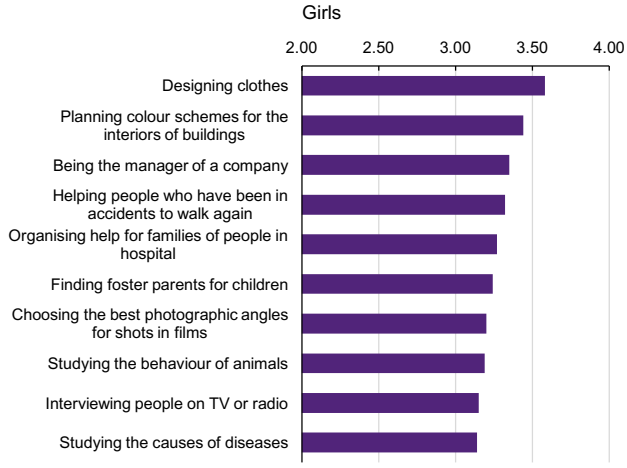


Figure 31: Average Importance of Year 8 Girls' Top 10 JIIG-CAL Choices (n=1157-1182)

Year 9

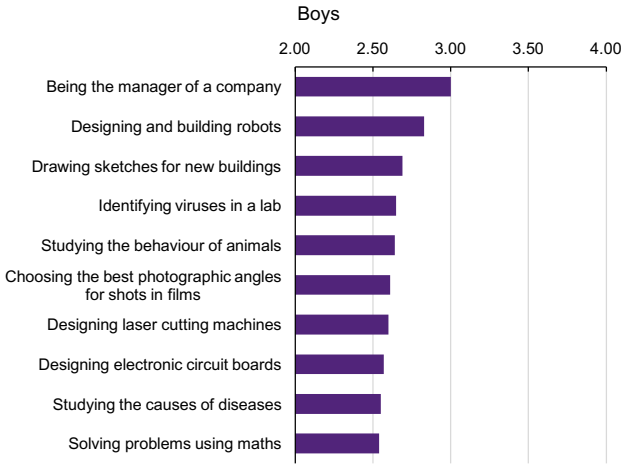


Figure 32: Average Importance of Year 9 Boys' Top 10 JIIG-CAL Choices (n=680-698)

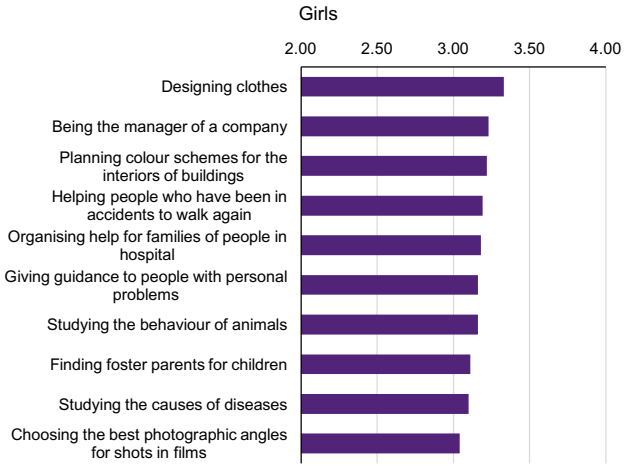


Figure 33: Average Importance of Year 9 Girls' Top 10 JIIG-CAL Choices (n=876-899)

Year 10

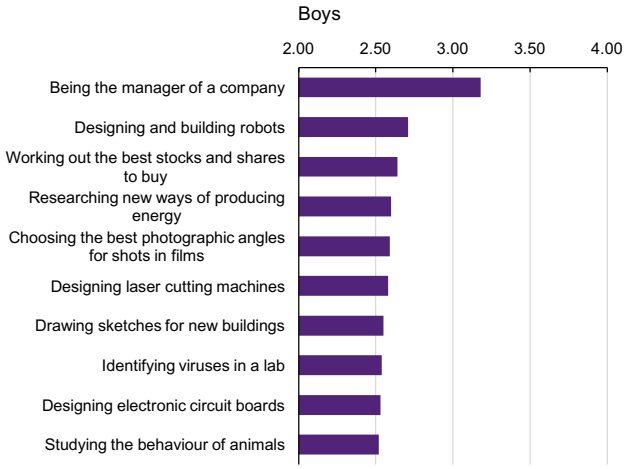


Figure 34: Average Importance of Year 10 Boys' Top 10 JIIG-CAL Choices (n=468-482)

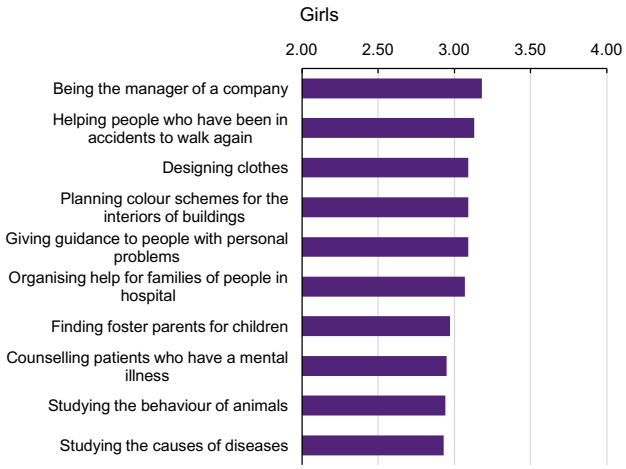


Figure 35: Average Importance of Year 10 Girls' Top 10 JIIG-CAL Choices (n=1022-1038)

Year 11

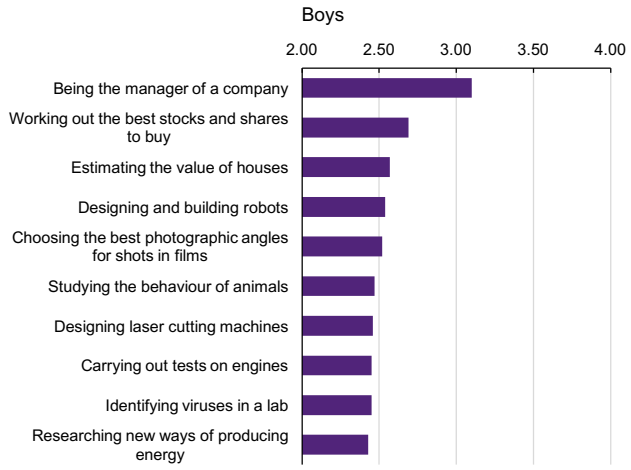


Figure 36: Average Importance of Year 11 Boys' Top 10 JIIG-CAL Choices (n= 592-628)

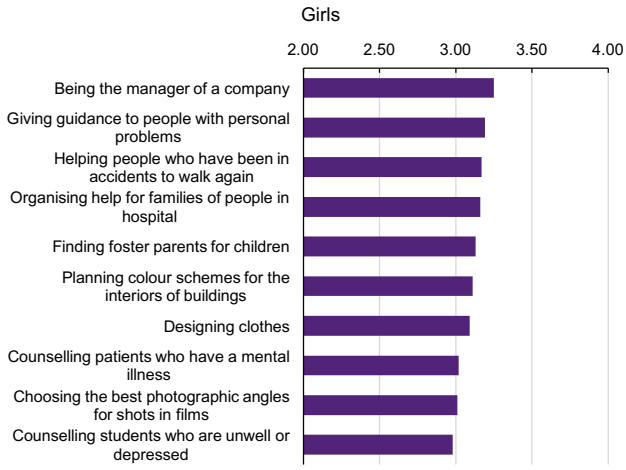


Figure 37: Average Importance of Year 11 Girls' Top 10 JIIG-CAL Choices (n= 730-743)

Likewise, when the responses to the 60 items are grouped into their 6 career domains, results of our analyses indicate **there are significant differences between boys and girls on all career domains**.[23] Average preferences indicated by boys and girls for each of the six career domains is represented below in Figure 38.

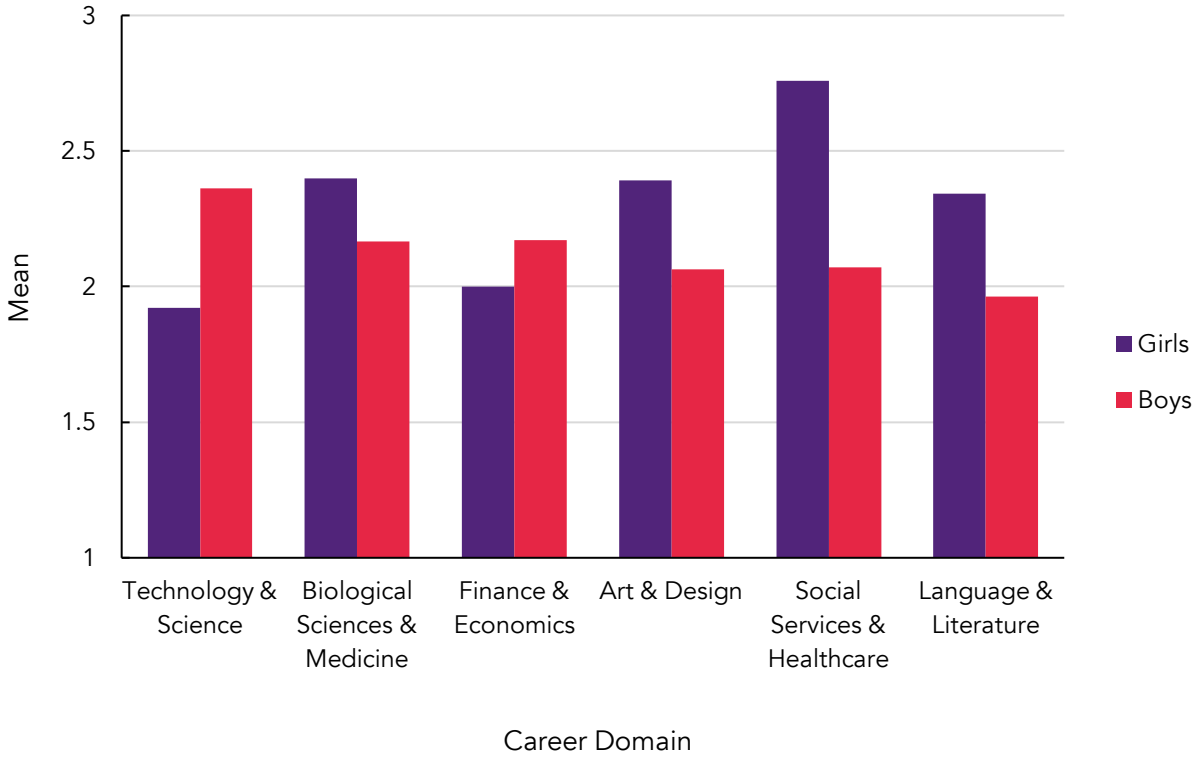


Figure 38: Mean Interest Levels of Boys and Girls for each Career Domain

23 Technology & Science: F (1,8278) = 476.98, p <.001, $\eta 2$ = .054; Biological Science & Medicine: F (1, 8278) = 112.79, p <.001, $\eta 2$ = .013; Finance & Economics: F (1, 8278) = 86.96, p <.001,$\eta 2$ = .010; Art & Design: F (1, 8278) = 261.63, p <.001, $\eta 2$ = .031; Social Services & Healthcare: F (1, 8278) = 974..52, p <.001,$\eta 2$ = .105, and Language & Literatures: F (1, 8278) = 387.82, p <.001, $\eta 2$ = .045.

Moreover, there were also significant differences between year levels in their preferences for the six different career domains.[24] When we examined gender differences at each year level with regard to each of the career domains, there were also significant differences, with the exception of *Language and Literature*, which remained robust for girls across all year levels. The remainder of the domains showed a gradual decline in interest as students got older. This is most likely a result of students beginning to identify their selected career domain and losing interest in the other domains over time. Provided below in Figures 39-44, are the visual depictions of the gender differences at each year level when students rated each career domain.[25]

With regards to *Technology and Science*, significant differences can be noted between boys and girls at each year level. These disparities in mean interest levels for activities and topics associated with *Technology and Science* start from Year 7 wherein girls express significantly lower interest in activities linked with the Technology and Science career domain. However, there is a note of caution here when extrapolating these results. Whilst the difference between boys and girls is significant, the average of these two translates into finding activities such as "*designing laser cutting machines*" or "*solving problems using Maths*" as somewhere between *slightly interesting or somewhat interesting*.

Therefore, perhaps the more pertinent questions that this finding poses, is this: What can be done to increase engagement and enjoyment of young boys and girls in the study of science and technology related activities prior to the commencement of high schooling years? The idea that interventions are required in primary school versus high school are born out by the results which show that **there are clear differences between boys and girls career domain preferences that are already well established prior to entering high school and these remain robust through their high school years**.

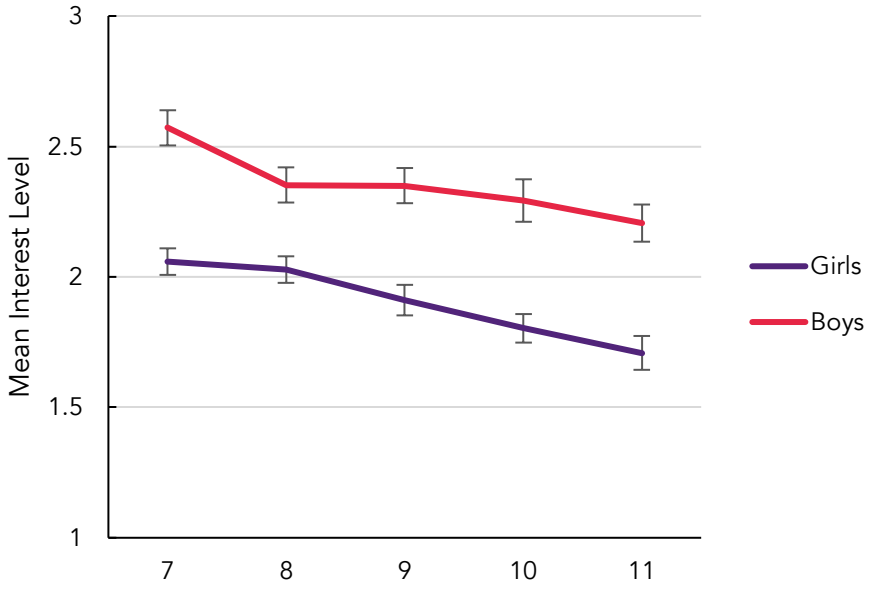


Figure 39: Interest Levels in Technology & Science as a Function of Gender and Year Level

24 Technology & Science: F (4,8278) = 35.19, p <.001, η^2 = .017; Biological Science & Medicine: F (4, 8278) = 14.59, p <.001, η^2 = .007; Finance & Economics: F (4, 8278) = 5.68, p <.001, η^2 = .003; Art & Design: F (4, 8278) = 62.62, p <.001, η^2 = .029; Social Services & Healthcare: F (4, 8278) = 6..26, p <.001, η^2 = .003, and Language & Literatures: F (4, 8278) = 28.27, p <.001, η^2 = .013.
25 See confidence intervals for indicators of group differences.

Upon examining students' preferences for *Biological Sciences and Medicine* (see Figure 40 below), boys and girls differed in their interest levels between year levels (note the difference between boys and girls in Year 7 is statistically significant, though the confidence intervals were close together).

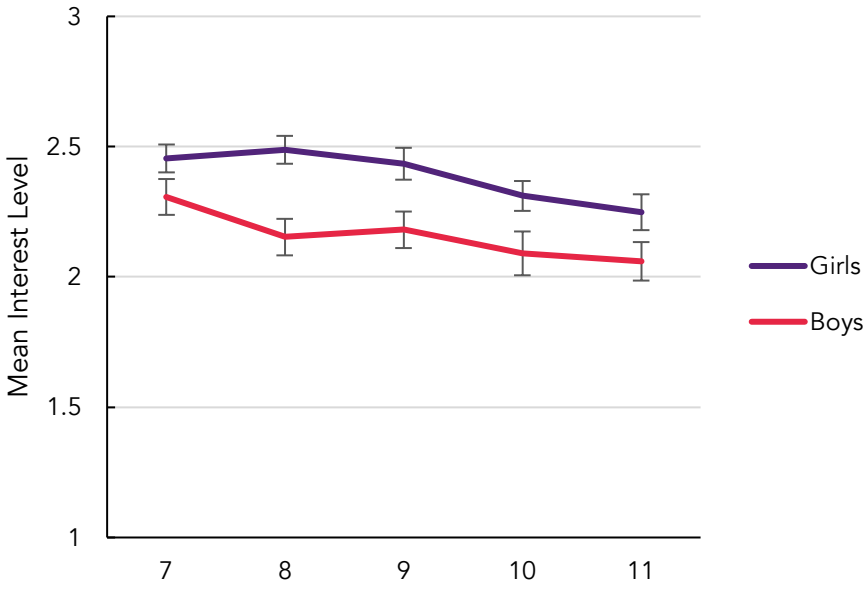


Figure 40: Interest Levels in Biological Sciences & Medicine as a Function of Gender and Year Level

The differences between boys and girls on *Finance and Economics* (see Figure 41 below) is statistically significant at all year levels with the exception of Year 8, as evidenced by the overlapping confidence intervals. There is some divergence between boys and girls from Years 9–11 at which point interest levels appear to converge once again (though further validation is required to examine whether these preferences actually might trend together in Year 12).

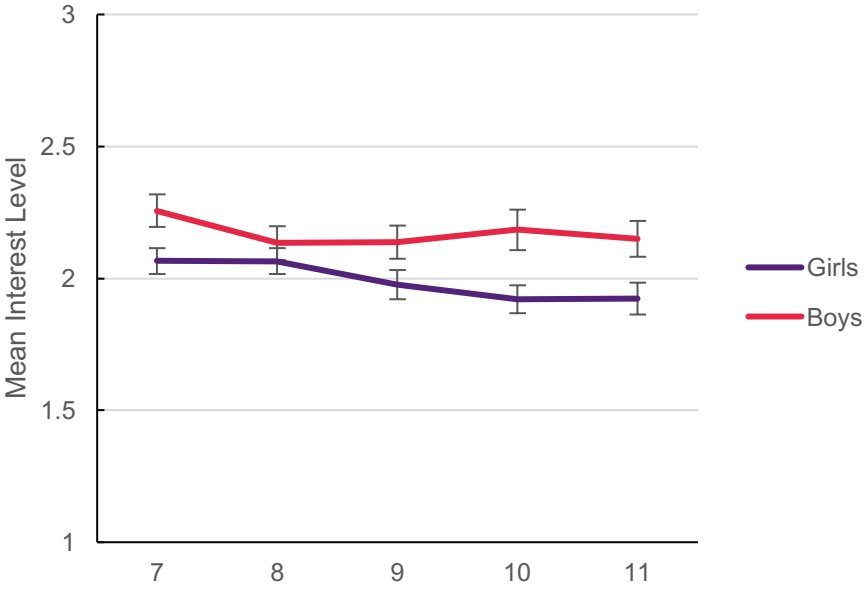


Figure 41: Interest Levels in Finance & Economics as a Function of Gender and Year Level

Differences in students' interest in *Art and Design* (see Figure 42 below) on the basis of gender and year at school was again significant. Girls were more inclined than boys to report higher levels of interest in activities consistent with a career within arts and design. There was a clear decrease in interest across Years 8–11, speaking to a narrowing of interests – a pattern noted above as being consistent throughout all career domains.

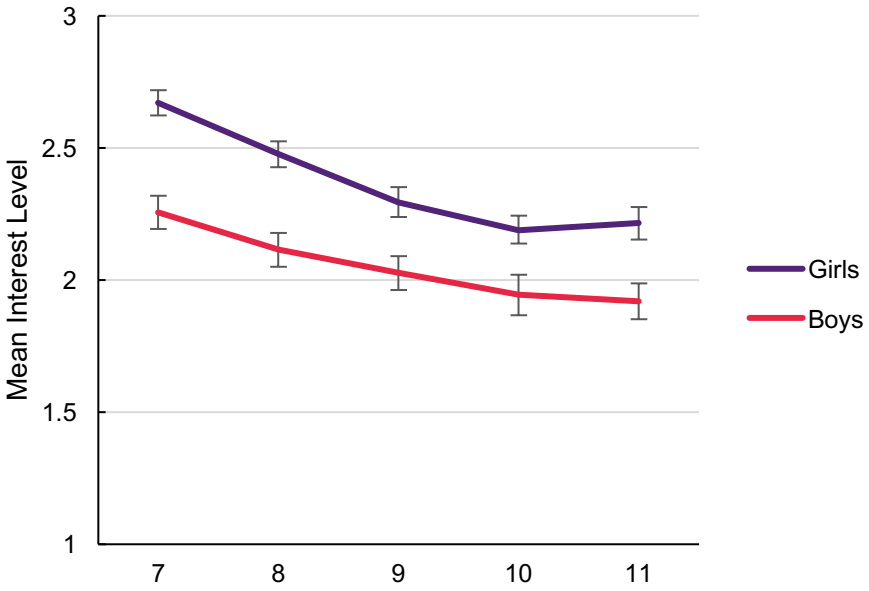


Figure 42: Interest in Art & Design as a Function of Gender & Year Level

Examining *Social Services and Healthcare* interest levels, see Figure 43 below, illustrates a mixed pattern of effects with boys' interest levels decreasing from Years 8–11. Girls' increase and decrease across these same years and return to a similar level in Year 11.

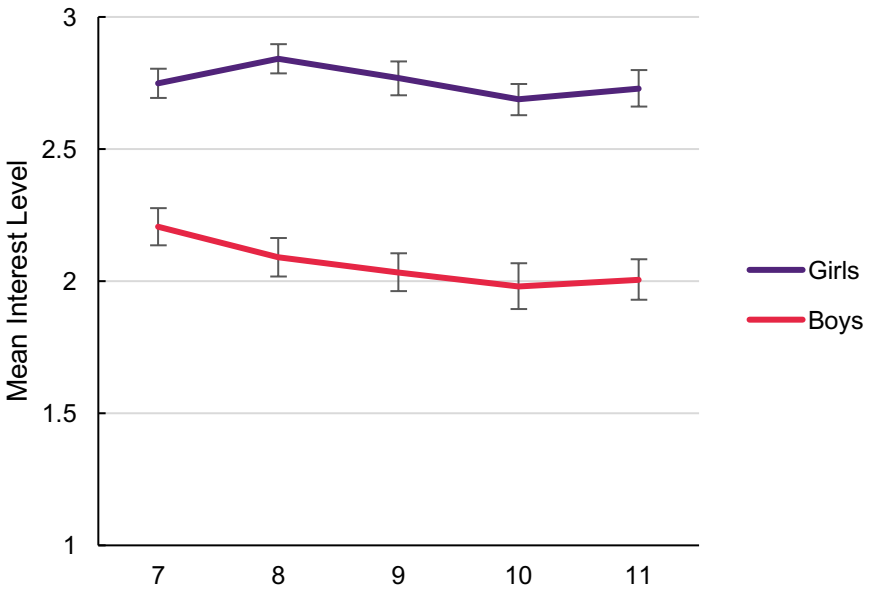


Figure 43: Interest in Social Services and Healthcare as a Function of Gender & Year Level

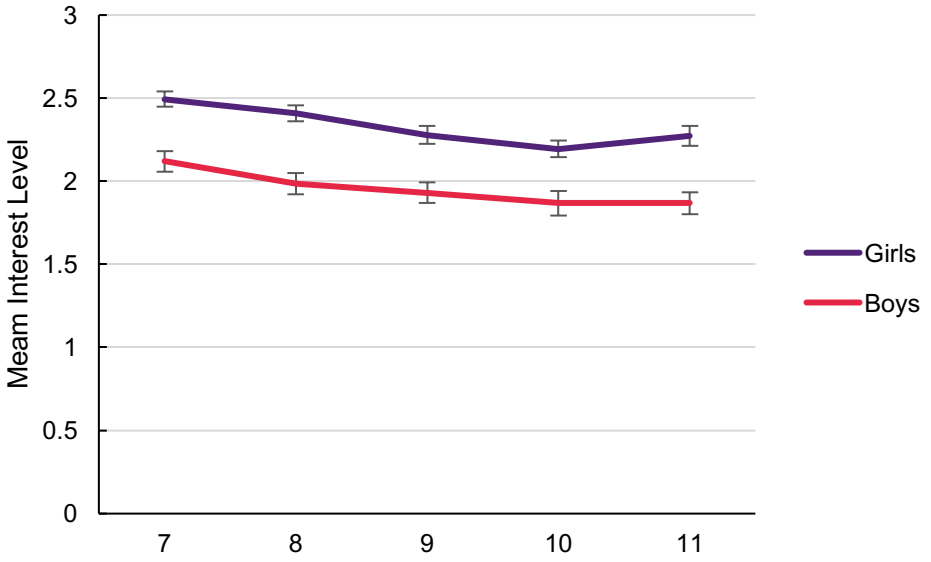


Figure 44: Interest in Language & Literature as a Function of Gender & Year Level

As shown in Figure 44, interest in *Language and Literature* did not significantly change across year levels, though did differ on the basis of gender with girls expressing greater interest in activities linked to language and literature relative to boys.

The convergent results, shown in Figures 39-44 above, indicate a range of disparities in the mean interest levels at different year levels across our sample. Nevertheless, it is important to note that the effect sizes are below those considered small (η_{small}^2= .01) whilst those effect sizes pertaining to gender and year level are markedly larger. Some key factors to consider when extrapolating the differences in career domains identified within our sample include:

- The Likert scale utilised within this current research program differs from the original forced-choice scale utilised within JIIG-CAL (1993). This is important to note as with increasing variation in possible responses, there is the chance that we are over-reporting the difference in interest levels of boys and girls.
- Career domains, as they are represented above suggest that to be interested in one career means not to be interested in another (e.g., I cannot do technology and science activities within a medical environment) however we understand that this is simply not true in the real world.
- We have not compared the within-student variation that may occur (e.g., students who are interested in all career domains / combinations of domains relative to other students who may express no interest in any domain).

Nonetheless, these results are compelling and in line with previous work highlighting that career intentions are formed from views around certain activities being preferential over others and that these ideas are formed early. Likewise, girls are more averse to some activities and careers than boys and vice versa and that these views are robust once they are formed.

Knowing Parents' Occupation & Education

Having knowledge of and a clear understanding of occupations and of role-models has been linked with positive career outcomes. For example, greater visibility of political role models is linked to adolescent girls' future political activism intentions (Campbell & Wolbrecht, 2006) with female role models serving a particularly important function when female representation is initially low in a given job / occupation in society (Gilardi, 2015). The positive benefits of role models is also linked to implicit beliefs about the 'suitability' of STEM that women report. For example, Young and colleagues (2013) show that when students[26] observe female STEM teachers as positive role models, they "automatically identified more strongly with science and stereotyped science as more feminine than masculine" (p. 283) and this translated into greater aspirations for science careers for both sexes. We know that parents serve a critical function in providing examples of possible career pathways. Indeed, we show that 79.40% of girls in our sample and 75.05% of boys report that their parents influence their career choices (see Table 11).

26 The sample utilised for this study comprised college students. However, the broader implication this study highlights is around the positive benefits that role models provide when aspirants identify with the role modeller which is likely to offer some insights for all students and educators, university-level or otherwise.

Combined, these findings surrounding the positive benefits of roles models and the importance and relevance of parents, suggest that where students have an awareness of and understanding of their parents' – as key role models – careers and education, and to the extent that these disconfirm extant gender stereotypes, then STEM careers (or indeed non-traditional career pathways) may prove more appealing to girls and boys. Nevertheless, in the first instance, it is important that girls and boys first understand both of their parents' education and career pathways. In light of the strong emphasis on academic performance within these schools, we might anticipate that students have a clear understanding and awareness of their parents' education and job history. Presented below in Table 13 is the results of a preliminary analysis of boys' and girls' understanding of the parents' education and careers.

Table 13., Frequency of Responses regarding Parents' Education / Occupation

Girls	Boys
Total: 5966 • ~11% (659) could not name mother's occupation (5307 or ~89% could) • ~12% (715) could not name father's occupation (5251 or 88% could)	**Total: 3499** • ~6.4% (225) could not name mother's occupation (3274 or 93.6% could) • ~6.4% (223) could not name father's occupation (3276 or 93.6% could)
Grade 7: 1459 students in total • 14.6% (213) could not name mother's occupation • 15.4% (225) could not name father's occupationl	**Grade 7: 1459 students in total** • 14.6% (213) could not name mother's occupation • 6.8% (52) could not name father's occupation
Grade 8: 1354 students in total • 10.4% (141) could not name mother's occupation • 11.4% (154) could not name father's occupation	**Grade 8: 1354 students in total** • 10.4% (141) could not name mother's occupation • 8.2% (61) could not name father's occupation
Grade 9: 982 students in total • 10.4% (102) could not name mother's occupation • 10.9% (107) could not name father's occupation	**Grade 9: 982 students in total** • 10.4% (102) could not name mother's occupation • 7.3% (54) could not name father's occupation
Grade 10: 1158 students in total • 10% (116) could not name mother's occupation • 11.8 (137) could not name father's occupation	**Grade 10: 552 students in total** • 4.3% (24) could not name mother's occupation • 3.6% (20) could not name father's occupation
Grade 11: 954 students in total • 8.6% (82) could not name mother's occupation • 9.1% (87) could not name father's occupation	Grade 11: 954 students in total • 4.4% (29) could not name mother's occupation • 4.4% (29) could not name father's occupation

Boys had a greater and earlier understanding of their mother's and particularly their father's occupations. Boys and girls who have an understanding of their parents' degrees and careers demonstrated a higher degree of self-confidence than those who did not.

In Year 7, an average of 15% of girls could not name either their mother's or father's occupations. Whereas only 6.8% of boys did not know their fathers occupation. Girls in Year 11 still stood at 9.1% not knowing their fathers occupation and 8.6% not knowing their mothers occupations. Boys had a greater and earlier understanding of their mother's and particularly their father's qualifications.

Land Area per Student

To further explore the distinction between time spent indoors vs outdoors (e.g., leadership roles, chores at home, activities engaged upon in an average week) that emerged within both qualitative and quantitative data collected in the surveys, we examined the total meterage per student of the school itself as well as the available play space. The choice of which ten schools to consider for each gender was informed by data adopted from the QTAC listing of QLD schools in the top banding for OPs 1-15. Enrolment data and campus size were calculated using the raw data contained in Tables 14 and 15.[27]

Results show that on average, each boy enrolled at the schools listed in Table 15 has access to 76.36 m2 while each girl enrolled across the schools examined in Table 14 had access to 50.78 m2. This average measurement is based on overall campus size, which may not adequately capture the total outdoor play space that boys and girls can access within the daily school routines. On this basis, we also calculated a measure of total outdoor play space contained within each school campus. This estimate incorporates open and outdoor space that is immediately available on exiting classrooms which students can utilise for leisure or 'play' based activities during the average school day without the need to travel to, for example, playing fields located elsewhere off campus (e.g., handball, futsal, hackie sack, socialising, etc.).

27 Campus sizes were calculated on the basis of main campuses listed (e.g., those listed in the publicly available enrolment packaging). Not included in this calculation were facilities that were owned by school, yet not readily accessible to students without transport. It is important to note that girls schools included in our sample express and demonstrate a strong commitment to team sport and have grounds and facilities outside of the central school campuses to support these.

Each of these total land areas for each student is also detailed within Tables 13 and 14 as outdoor space. As a gross measure of play space immediately available to students outside of class times, girls on average had access to 11.30 m2 while boys have access to 33.19 m2.

What is immediately apparent is that boys are privileged with 3 times the amount of space for outdoor play compared to girls. While we can only speculate about the relative effect this may have upon girls and boys, it might not be too much to suggest that outdoor play is more greatly facilitated at all boy versus all girl schools in Queensland. The ability for engaging in unscheduled team sporting activities such as football, soccer and informal games such as red rover etc are far less likely to occur where play space is insufficient.

However, it should be noted that the girls' schools comprised in our sample all have secondary campuses where structured team sports can occur and that these venues are regularly travelled to by the students. Hence, while we have demonstrated that this lack of outdoor play space has no impact upon the development of self-confidence, we speculate that it still may contribute towards the idea of boys feeling that outdoor careers are more of a 'natural' option than for girls.

Table 14: Land Area per Student for Top Matriculating Girls Schools in Brisbane

School	Enrolments	Campus Size	Campus m2 / Student	Outdoor Space	Outdoor Space m2 / Student
1. All Hallows	1558	35 273 m2 547 Ann Street, Fortitude Valley	22.64 m2	4714 m2	3.03 m2
2. Brisbane Girls Grammar	1357	27 378 m2 70 Gregory Tce, Spring Hill	20.18 m2	4762 m2	3.51 m2
3. Clayfield College	758	41 397 m2 23 Gregory Street, Clayfield	54.61 m2	7643 m2	10.08 m2
4. Ipswich Girls Grammar	844	82 467 m2 Chermside Road / Queen Victoria Parade, Ipswich	97.71 m2	22 198 m2	26.30 m2
5. Loreto College	796	27 331 m2 415 Cavendish Road, Coorparoo	34.33 m2	7412 m2	9.32 m2
6. St Hilda's Girls School	1129	104 536 m2 52 High Street, Southport	92.59 m2	27 914 m2	24.73 m2
7. St Rita's Girls School	1030	25 801 m2 Enderley Road, Clayfield	25.05 m2	5706 m2	5.54 m2
8. Somerville Girls School	1306	44 140 m2 Graham Street, South Brisbane	33.80 m2	7815 m2	5.98 m2
9. Stuartholme School	671	70 864 m2 Birdwood Terrace, Toowong	105. 61 m2	14 442 m2	21.52 m2
10. St Aiden's Anglican School	705	13 582 m2 11 Ruthven Street, Corinda	19.26 m2	2071 m2	2.94 m2

Table 15: Land Area per Student for Top Matriculating27 Boys Schools in Brisbane

School	Enrolments	Campus Size	m2 / Student	Outdoor Space	Outdoor Space m2 / Student
1. Brisbane Boys College	1568	87 632 m2 Kensington Terrace, Toowong	55.89	43 978 m2	28.05 m2
2. Toowoomba Grammar School	1234	204 000 m2 24 Margaret Street, East Toowoomba	165.32	110 513 m2	89.56 m2
3. Brisbane Grammar School	1709	70 935 m2 23 Gregory Terrace, Spring Hill	41.50	23 073 m2	13.50 m2
4. St Joseph's Nudgee College	1541	257 534m2 2199 Sandgate Road, Boondall	167.12	92 033 m2	59.72 m2
5. Anglican Church Grammar School	1785	228 986 m2 Oaklands Parade, East Brisbane	128.28	135 607 m2	75.97 m2
6. St Patrick's College[28]	1285	25 122 m2 60 Park Parade, Shorncliffe	19.55	5453 m2	4.24 m2
7. Ipswich Grammar School	919	79 089 m2 Darling St E, Ipswich	86.06	32 746 m2	35.63 m2
8. Padua College	1293	49 856 m2 80 Turner St, Kedron	38.56	18 659 m2	14.43 m2
9. St Laurence's College	1832	47 856 m2 82 Stephens Road, South Brisbane	26.12	10 023 m2	5.47 m2
10. Villanova College	1221	42 938 m2 24 Sixth Avenue, Coorparoo	35.17	6513 m2	5.33 m2

28 2015 figure as 2016 Annual Report not publicly available

Discussion

Confidence

A significant finding of this study was that in terms of overall self-confidence between boys and girls in the sample cohort, there were no significant differences between boys and girls. While other factors may be contributing to this result, the choice to explore self-efficacy in single-sex schools has been vindicated as providing at least one set of conditions whereby self-efficacy is gender neutral. The importance of this finding cannot be understated, since arguments over the origins of women's self-confidence in the workplace are driving organisational interventions in the areas of pay and progression, leadership development, executive selection and communication, to name but a few (Eagly & Carli, 2007).

Understanding that men and women are not innately less or more confident than one another, and that confidence levels are developed or undermined by contextual factors, places more emphasis upon organisations examining themselves first, rather than starting from the position of trying to fix women (Fox, 2017).

The study has identified that certain activities which are facilitated by single-sex schools and parents are playing significant roles in developing self-confidence in adolescents. As Day (2000) notes, in order to improve self-confidence, individuals need to first get to know themselves.

Schools looking to develop self-confidence in their students should have leadership training and development activities which include self-awareness and self-understanding tools (Stone, 2014). Getting to know one's self occurs best from having a wide range of experiences and being able to process how one interacts with these experiences. This is perhaps why travel features as the most important of the self-confidence development tools, especially where unsupervised learning opportunities are embedded in the travel.

Likewise, team sport and in particular roles which require active engagement with questions of leadership, emerged as the second most important source of self-confidence development. Structured in-class development activities should also teach a suite of leadership behaviours that help in framing communication and choosing appropriate ways of interacting with others and can leverage off the lived experiences of students in their travel and sport (see Kouzes & Posner, 2002; Bolman & Deal, 2008 for examples).

While travel, team sport and leadership activities feature heavily in the discussions throughout this report, they are by no means the only contributors to self-confidence. Mastery over a musical instrument, engagement with social justice and advocacy issues, meaningful relationships with friends, participation in the workforce through part-time jobs and contributing at home through undertaking chores all contributed to overall self-confidence. Teachers and parents can be agents and partners in facilitating these activities.

Secondly, as an adolescent, one is trying to move from dependent to more independent relations, and the emerging adult is figuring out what is required as an individual at school, at home, with friends and in life, generally. The role of schools and parents is to overtly establish these expectations, as well as the level of competence and behaviour expected of the adolescent. When an individual has an understanding of these expectations, they have an external standard that they can more or less objectively measure and monitor (Day, 2000).

The task of the adolescent is then to 'get to know their stuff', to develop their personal and inter-personal skillset to the degree that they can objectively say 'I know as much about this as anyone' or even better. However, as we have elaborated in several places throughout this report, to do so often requires taking risks, being prepared to try and to fail. There is a limit to what we can teach in the classroom and some things can only be learned through personal experience (Day, 2000; DeCieiri et al., 2008; Stone, 2014). As such we need to carefully consider the trade-off between 'protecting' children through prescription and allowing opportunities for self-discovery through trial and inevitable error as they transition from dependence to independence.

However, knowing something is often not enough in terms of self-confidence and self-belief (Estes & Felker, 2012). Adolescents, in particular, need to test their knowledge against others to confirm their emerging beliefs and values. Having a healthy relationship with teachers and parents who can act as mentors is a powerful way for students to test and confirm their knowledge and behaviour. This is one area where schools can excel in assuring that no student goes unnoticed and that someone outside of parents has an overall eye to their progress and development.

Having a solid understanding of what is required in life makes it a lot easier for the adolescent to be confident and to take more informed and thoughtful risks (Kay & Shipman, 2014). It also allows the adolescent to see the gap more clearly between where they are now and where parents and/or schools would like them to be semester to semester or year to year. Providing this clear road-map also makes it easier for students to contribute in structured, meaningful and useful ways at meetings (Heath, Flynn & Holt, 2014).

Gender Congeniality and Career Paths

The results for time spent outdoors on activities between boys and girls, and the time spent on indoor and outdoor chores and (others), revealed a pattern across responses to different questions that could be characterised as displaying an indoor (girls) / outdoor (boys) divide.

This raises the critical issue of gender congeniality (Eagly & Carli, 2007). Gender congeniality refers to societal expectations about what roles women and men should occupy (Wood & Eagly, 2002). If girls are receiving messaging that they should undertake indoor activities whether these are social or work based, this message has significant implications for the kinds of work they (and society) will expect them to undertake and directly impacts upon their subject choices and career planning.

There are many factors at work. These might include a lack of career guidance at school, coupled with little input from parents or schools about the ways in which media portrays gender roles, or indeed the modelling of gendered expectations around indoor versus outdoor activities by the actions of both parents and schools. In turn each may lend greater weight to influences from broader society and the media regarding the gender congeniality of certain career paths (see Reid, 1995). As noted by Wood and Eagly (2002), these factors together lead many women away from roles which produce greater opportunities to acquire valuable career capital, such as line roles in engineering, geology or the trades for example.

It is a well-researched phenomenon that, women tend to be diverted by organisations toward gender congenial roles and they are often not considered for line roles. Lyness and Thompson (2000) reported that women are offered relatively fewer line role opportunities. This means that women are diverted to support functions such as legal, finance, marketing, human resources and office assistants. Fitzsimmons and Callan (2015), for example, found that many organisations believe that line roles were not gender congenial to women. They described positions such as underground mine and construction site supervisors, geologists and factory managers as sometimes being 'dirty and dangerous' roles and 'not what women wanted to do'. While these stereotypes are just that, if schools, parents and media reinforce either consciously or unconsciously that 'men work outdoors' and 'women work indoors' they are playing directly into these stereotypes and perpetuating them for yet another generation.

As noted by Evans and Diekman (2009), the unequal assignment of women to support functions because of perceived gender congeniality (Wood & Eagly, 2002) presents significant barriers to women in obtaining line role experience and progressing into senior leadership roles. While, it may seem inconsequential, the expectations established in adolescence about indoor versus outdoor activities whereby outdoors is for boys and indoors is for girls, generates and reinforces societal expectations around gender congeniality. This is a pattern that must be addressed by schools and parents alike.

The results surrounding differences in understanding between boys and girls regarding parents' careers shows that more and earlier conversations are still happening between boys and their parents versus girls and their parents. This finding is also in line with recent research by the Commonwealth Bank showing that boys' financial literacy was ahead of girls' entering the workforce (Ritchie, 2018). This may be a vestige of the 'male bread winner' model where traditional expectations are placed upon the male to be the main earner. Not only is this becoming less and less the case in reality, it may be driving boys career behaviours at the expense of their own personal career interests. While not definitive evidence, the difference between boys' and girls' enthusiasm for the activities indicative of preferential career domains as evidenced in the results above, would seem to indicate this.

Future Research

Before we can make broader conclusions about the generalisability of the findings of this study, an identical study in co-educational top matriculating schools needs to be conducted. While previous studies of co-educational adolescent cohorts overseas (primarily the U.S.) have indicated gender differences at all ages in levels of self-confidence, the nature of our sample may indicate that students of higher academic attainment, regardless of gender, may display higher levels of confidence. Alternatively, Australian adolescents may differ from U.S. adolescents. The latter, however, is unlikely given that Australian workplaces demonstrate the same confidence effects between men and women as do American workplaces.

Likewise, there is an assumption that confidence issues for women in the workplace are shared equally between women emerging from single-sex schools and those coming from co-educational environments. This may not be the case. It may be that the confidence established in single-sex schools is robust and withstands the pressures identified in the literature as occurring in tertiary institutions and the workplace generally. This remains to be tested in future research.

Research regarding preferential activities that relate to future career domains needs to be undertaken with primary school aged children and perhaps earlier. This presents significant difficulties, since tools would need to be devised that replicate those used in this study but be applicable to the literacy and understanding levels of 6-12 year olds. Nonetheless, this is where interests and understanding of careers are being formed, not high school.

About the Authors

Dr Terrance Fitzsimmons is a Senior Lecturer in Leadership with The University of Queensland Business School. He is also a Chartered Accountant with over 30 years of practice. He is the director of the AIBE Centre for Gender Equality in the Workplace and Managing Director of the Australian Gender Equality Council (AGEC), a body whose members comprise of peak national bodies representing 600,000 women across industry sectors in Australia.

His PhD in Leadership examined successful attributes of CEOs and differing pathways to CEO roles for men and women. In June 2015, Dr Fitzsimmons and Professor Callan released 'Filling the Pool' a major report into gender inequality in Western Australia and what government, organisations and individuals can do to address the issue.

Dr Fitzsimmons has worked with many of Australia's largest firms on their diversity programs and speaks regularly in Australia and overseas in the area of gender equality and inclusion. He has served as national and state presidents of not for profit bodies as well as being a director on boards of Listed Public Companies in Australia and overseas.

Dr Miriam Yates is a Postdoctoral Research Fellow at The University of Queensland Business School within the AIBE Centre for Gender Equality in the Workplace. She is also a Registered Psychologist who consults with organisations on matters of strategic planning, diversity and inclusion, leadership development and psychological health and wellbeing at work.

Her PhD examined the gendered nature of power and the implications this has for women and men's career advancement. Since, Miriam's research portfolio has grown to include topics such as processes of career transitioning in male-dominated industries, the paradox mindset as it relates to women navigating positions of leadership and projects evaluating the efficacy of gender equality policy and procedures in Australian organisations.

Professor Victor Callan is Professor of Management and Leadership at The University of Queensland (UQ) Business School, and Associate Dean (Research) at UQ's Faculty of Business, Economics and Law. He has an international research reputation in the fields of organisational change, work stress, and leadership. He has published in the world's leading management and psychology journals, and based on this record of achievement was elected as a Fellow of the Academy of Social Sciences in Australia. Victor has won the UQ Award for Excellence in Higher Degree Research Supervision, and is also a recipient of two UQ Excellence in Leadership Awards for his roles in developing research and industry partnerships. In 2015, with Dr Fitzsimmons, he co-authored 'Filling the Pool' that has emerged as a major report into gender inequality in Western Australia, and the actions required to address the issue. In 2016, he was a member of a high-profile research team that investigated skills development in Australia's most innovative organisations in a project funded by the Federal Chief Scientist.

Victor is a regular contributor to executive education and workshops for senior executives and managers in the areas of organisational, workforce and leadership development. He has served on government boards, and completed over 100 projects for Federal, State and local government departments including major reviews on skills, training, change and leadership and workforce development.

Scoping Team and Sponsors

A project of this scope could not be undertaken without the support and contribution of others. The research team wishes to especially acknowledge the contributions of the following individuals and organisations through their technical expertise and unwavering professional support throughout the project.

Loren Bridge is the Executive Officer and Company Secretary of the Alliance of Girls' Schools Australasia and has been in that role since 2013. Loren was instrumental in recognising the linkages between previous studies into the success of female CEOs in Australia and the confidence generated in girls in single sex schools.

Loren shares a strong commitment to gender equality, leading campaigns through the media on issues of gender disparity and calling out issues of misrepresentation and gender bias. The Alliance network has built a strong media presence and social media footprint. Loren has overseen the Alliance's sponsorship of research related to gender issues recently funding a Monash University study into STEM engagement and careers. For the past four years Loren has driven the Alliance's engagement with schools, business, community and industry organisations establishing successful partnerships and initiatives such as 'Yarning Up' with Bond University, a program honoured with the 2016 Queensland Premier's Reconciliation Award, and a STEM project that has seen over 500 girls from 52 schools participate in NASA's space school program in the USA.

Jan Richardson is the Research Officer for the Alliance of Girls' Schools Australasia and was heavily involved in scoping and testing the surveys used in the study. Jan liaised extensively with the team in identifying areas requiring adjustment in investigative methods for research in schools and in briefing the team on everything from adolescent attitudes to common parlance and hobbies.

Bob Bredemeyer is the Managing Director of JIIG-CAL Australia and was previously registered as a psychologist and a lecturer in Management Studies. He consults widely with the State Education Departments throughout Australia and the United Kingdom.

Bob met with the team several times in scoping the career aspects of the project and in adapting the Career Compass software to be suitable for the younger students in the research cohort. Bob was always available to provide valuable advice in terms of adolescent career thinking and in interpretation of preliminary findings. Bob was also heavily involved in scoping and testing the surveys used in the study.

Michelle Fitzsimmons is the Managing Director of Equitus Consulting and was heavily involved in the delivery of the 'Navigating CEO appointments: Do Australia's top male and female CEO's differ in how they made it to the top?' and 'Filling the Pool' projects, which were precursors to the current study. She was involved in early discussions regarding the scope and content of the current study.

Michelle has been involved throughout the project in developing, formatting and pilot testing of the survey instruments, as well as in conducting half of the interviews for the qualitative component of the study. Michelle was also involved in testing early findings from the preliminary data and was heavily involved in editing and proofing of the report.

Alliance of Girls' Schools Australasia - The Alliance of Girls' Schools Australasia was an instigator of the research project and has been an unwavering supporter during the life of the project. The Alliance is a leading voice for the education and empowerment of girls and women.

In collaboration with girls' schools and key partners, the Alliance strives for a world where women make a difference in new and impactful ways, promoting inclusion and enhancing society. The Alliance network comprises 165 diverse member schools. The Alliance represents over 132,000 girls, over 10,000 educators and attracts over 6000 program participants annually to local events, and regional and international conferences, also reaching a broad local and international audience via social media and print and digital publications.

The Australian Gender Equality Council is a sponsor of the report and recognised the need to understand whether gender differences in self-confidence being described in the workplace, existed under all conditions and whether this phenomenon extended back into childhood. The research was viewed by AGEC as filling a large gap in the knowledge required to address gender inequality in the workplace more broadly. The board of AGEC was heavily involved in scoping and monitoring progress of the project.

AGEC was formed to respond to the unacceptably slow pace of change towards gender equality in Australia. It comprises of leading member-based organisations representing over 600,000 women in various industry sectors across Australia.

The Australian Gender Equality Council (AGEC), is a national not-for-profit organisation whose vision is simple – to achieve gender equality in Australia. Through high profile national awareness campaigns, advocacy and research, it aims to drive a cultural shift in Australia so that women and men have the same rights and opportunities across all sectors of the community. AGEC believes that gender equality will be achieved when the different behaviours, aspirations and needs of women and men are equally valued, respected and are manifest in Australian society.

AGEC's objectives are:

1. To act as an authoritative and independent voice for gender equality in Australia

2. To advocate for and raise awareness of gender equality in Australia

3. To develop research driven policy in the area of gender equality in Australia

4. To raise awareness of the impact upon gender equality of policy and legislation.

The University of Queensland Business School and **Faculty of Business, Economics and Law** provided funding for the project. Additionally, these bodies, as well as the Australian Institute for Business and Economics, were instrumental in the establishment of the AIBE Centre for Gender Equality in the Workplace. This report represents the first in a series of reports that will emerge from ongoing projects being undertaken by the Centre.

Appendix A
Methods, sample and procedure

A-1 Method

Elite single-sex girls' and boys' schools were selected for the program of research for two reasons:

1. Elite schools produce significantly more university applicants, are actively working to improve leadership, self-efficacy and to improve the career outcomes of the student bodies and were therefore more directly suited to the research outcomes of this project.

2. Girls' schools might potentially shield girls from some negative structural effects identified as reducing women's confidence in the workplace.

Consultation in developing the research protocol

In establishing the Survey Protocols shown in Appendices 2 and 3, we have consulted with the Alliance of Girls' Schools Australasia CEO (Loren Bridge) and Chief Research Officer (Jan Richardson) with specific consideration given to the matters set out in Chapter 4.2, Children and Young People, in the National statement on ethical Conduct in Human Research (2007) (updated May 2015). We also met individually with the Principals and Deputy Principals of each school involved in the research.

At these meetings we provided an overview of the project and its aims as well as draft protocols for their comment. These meetings occurred throughout May and June 2016 and were used to both present the project, as well as to gather feedback on the project and how best to operationalise it.

The final draft protocols were also tested in two schools, one boys' school and one girls' school, with trial groups of 30 Year 7 boys and girls to test comprehension of the survey instruments.

School principals nominated a school representative, mostly the deputy principal, to ensure that participant information sheets and consent forms were sent to every parent and student of their school and to identify those who had not received consent to participate in the study. Students without consent were accommodated in a separate venue while the surveys were conducted. Each school also provided a year level coordinator and other teaching staff to supervise the process of data collection.

A-2
Sample

Table 16: Sample Characteristics

School	Gender	Year Level	Survey 1	Survey 2
1	Girls	7	237	176
		8	230	191
		9	196	173
		10	228	192
		11	233	206
2	Boys	7	180	145
		8	142	104
		9	138	114
		10	106	58
		11	129	110
3	Girls	7	245	231
		8	194	173
		9	155	162
		10	218	231
		11	261	85
4	Girls	7	95	92
		8	77	68
		9	42	38
		10	99	94
		11	98	93
5	Girls	7	276	224
		8	213	204
		9	164	152
		10	28	13
		11	25	10
6	Boys	7	177	172
		8	200	196
		9	203	201
		10	145	136
		11	225	217
7	Boys	7	268	265
		8	246	241
		9	255	251
		10	186	175
		11	162	157
8	Girls	7	168	159
		8	194	189
		9	147	141
		10	159	153
		11	155	149

School	Gender	Year Level	Survey 1	Survey 2
9	Girl	7	143	115
		8	157	125
		9	103	70
		10	121	92
		11	104	84
10	Girls	7	82	73
		8	97	82
		9	49	47
		10	85	78
		11	58	59
11	Girls	7	93	84
		8	95	85
		9	52	50
		10	94	85
		11	58	57
12	Girls	7	120	51
		8	96	67
		9	74	67
		10	126	101
		11	0	0
13	Boys	7	145	144
		8	156	153
		9	143	132
		10	115	112
		11	149	146
Total		**7**	**2229**	**1931**
		8	**2097**	**1878**
		9	**1721**	**1598**
		10	**1710**	**1520**
		11	**1657**	**1373**
	Total		**9414**	**8300**
Incomplete/ Unidentified	Boys		226	123
	Girls		436	202
Total			**10076**	**8626**

A-3 Procedure

After discussions with all of the participating schools it was decided that the students would come together in their respective school halls by year level and complete the surveys online together using their laptops. Where schools decided that insufficient time was available during school hours, one or both surveys were allocated as homework to be completed outside school hours in the following week. Two schools used this option. The principal investigator was present the whole time during school hours data collection in order to facilitate the answering of all questions of students.

Survey 1

Sherer and his colleagues (1982) constructed and validated a 23 item self-efficacy scale which is included as the first item in the first survey instrument. Modifications to the survey were made using feedback from the Alliance of Girls' Schools Australasia in order for it to be suitable for children at the lower end of the age range (13 years old) contemplated by the study. The survey also captured data surrounding subject choices, extracurricular activities, leadership roles, and key influencers on subject choices (See Appendix 2 – Survey 1). The first survey was conducted through Survey Monkey and the average time taken for completion was 25 minutes. The data collected from Survey 1 was transferred from Survey Monkey into SPSS software at The University of Queensland for analysis.

Survey 2

Each student was also asked to complete a version of the on-line 'JIIG-Cal Career Compass Survey' (Closs, 1993), that was likewise converted and run through Survey Monkey, which explored student views on potential career paths and what was influencing their decisions regarding potential career paths (See Appendix 3 - Survey 2). Survey 2 took students approximately 35 minutes to complete. Data collected for Survey 2 was transferred from Survey Monkey into SPSS software at The University of Queensland for analysis.

Data Analysis

The various mechanisms by which the data has been analysed are separately reported in each separate results section of the report above.

Sample

The sample was drawn from 13 schools based upon appearance in the top schools listed by OP attainment in Queensland (See Table 15 below). 9 girls' schools and 4 boys' schools participated in the research. The girls' schools were approached and secured for participation first and the boys' schools selected based upon their match in terms of average OP with the girls' schools. Note that the boys' schools, on average, have much larger enrolments of students and thus fewer boys' schools were required to obtain a matching sample.

The sample size was determined based upon providing a statistically viable sample for analysis. A minimum of 500 students per year level, per gender was considered to be a minimum sample for this purpose. This sample size was obtained. In all, 10,076 students participated in the research, with 9,414 students completing surveys which were usable, representing an attrition rate of 6.5%. The majority of the unusable surveys related to students who had not included their year level on the survey and therefore we were unable to categorise their data.

Due to time constraints in some of the schools, the completion rate of the second survey was lower than the first, as some students ran out of time during the allotted period at school.

A4
Ethical Clearance

The Bellberry Human Research Ethics Committee (HREC) reviewed this study in accordance with the National Health and Medical Research Council's National Statement on Ethical Conduct in Human Research (2007, incorporating all updates as at May 2015) (National Statement) on the 5th September, 2016.

Bellberry HREC is constituted and operates in accordance with the National Statement.

Bellberry Human Research Ethics Committee approved this project, noting that the application met the requirements of the National Statement.

Table 17: Means, Standard Deviations and Correlations of Focal Variables

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Gender	0.26	0.97																												
Year Level	8.84	1.43	-.025*																											
Overall Efficacy	6.50	0.98	0	-.143**																										
General Efficacy	6.52	1.02	-0.003	-.150**	.958**																									
Social Efficacy	6.41	1.39	0.006	-.066**	.694**	.457**																								
Team Sport	1.54	1.32	-.227**	-.039**	.182**	.163**	.157**																							
Individual Sport	0.67	1.14	-.387**	-.036**	.098**	.093**	.072**	.156**																						
Camping	0.50	0.94	.028**	-.083**	.036**	0.02	.060**	.055**	.077**																					
Drama	0.51	0.91	.122**	-.088**	-.094**	-.081**	-.088**	-.046**	0.01	.069**																				
Computer/ Console gaming	1.97	1.31	.055**	.204**	-.187**	-.204**	-.068**	-.065**	-.113**	-0.001	.023*																			
Social Media	0.82	1.24	-.676**	.132**	-0.017	-.038**	.042**	.248**	.340**	-0.002	-.052**	-.039**																		
Fishing	0.57	0.90	.132**	-.069**	.066**	.053**	.069**	.070**	.106**	.253**	.092**	-.026*	-.024*																	
Hiking/ Orienteering/ Walking	0.63	0.90	.046**	-.076**	.026*	.036**	-0.008	0.01	.113**	.182**	.194**	-.030**	0.014	.212**																
Arts & Crafts	0.42	0.81	.061**	-.115**	.052**	.053**	.030**	.087**	.108**	.133**	.099**	-.028*	.026*	.234**	.183**															
Riding (e.g., Horse, Bike)	0.63	1.06	-.078**	-.095**	.063**	.048**	.072**	.086**	.163**	.209**	.027*	-.035**	.081**	.166**	.151**	.099**														
Dance	0.53	0.97	.331**	-.038**	0.006	.024*	-.043**	-.081**	-.094**	.109**	.180**	-.072**	-.200**	.135**	.178**	.124**	0.021													
Playing a Musical Instrument	0.33	0.81	-.272**	-.033**	.048**	.052**	0.018	.073**	.234**	.069**	.031**	-0.005	.227**	.043**	.086**	.183**	.074**	-0.014												
Boating	0.32	0.68	.027*	-.080**	.055**	.052**	.040**	.075**	.139**	.252**	.153**	-.088**	.044**	.363**	.214**	.186**	.170**	.135**	.096**											
Board/Role Playing Games	0.19	0.56	-.302**	-.069**	-0.006	0.002	-.024*	.084**	.223**	.108**	.082**	.049**	.182**	.097**	.145**	.147**	.122**	0.007	.269**	.140**										
Scouts, Girl Guides etc	1.50	1.48	.739**	0.008	.039**	0.004	.108**	-.130**	-.237**	.099**	.121**	.190**	-.482**	.191**	.091**	.108**	-0.013	.245**	-.140**	.085**	-.188**									
Hanging out with Friends	1.92	1.14	-.238**	.083**	-.026*	-.057**	.060**	.115**	.145**	.065**	.063**	.151**	.291**	.034**	.073**	0.007	.087**	-.081**	.087**	.071**	.115**	-.072**								
Watching TV/ Movies	1.97	1.18	.159**	.204**	-.123**	-.142**	-.027*	-.033**	-.072**	.046**	.124**	.329**	0.016	.060**	.097**	0.02	-0.007	.124**	-0.017	0.008	0.011	.249**	.253**							
Listening to Music	1.59	1.19	-.292**	.081**	.024*	.032**	-0.006	.106**	.183**	.037**	.066**	-.078**	.401**	.037**	.141**	.092**	.049**	.076**	.167**	.114**	.122**	-.190**	.229**	.169**						
Reading	1.10	1.10	.076**	-.101**	.114**	.115**	.066**	.039**	.051**	.069**	.102**	.069**	-.089**	.134**	.132**	.150**	.081**	.092**	.160**	.118**	.144**	.158**	.038**	.107**	.069**					
Other	0.92	1.40	-.119**	-.080**	.059**	.062**	.024*	.101**	.160**	.134**	.098**	-.024*	.129**	.149**	.186**	.140**	.132**	.049**	.123**	.156**	.162**	0.003	.125**	.083**	.161**	.169**				
Leadership Training	-0.19	0.98	.189**	.069**	.145**	.134**	.112**	.034**	-.023*	.052**	0.007	-0.008	-.123**	.058**	.028*	.042**	0.012	.070**	-0.01	.052**	-0.012	.163**	-.040**	0.007	-.024*	.062**	.046**			
Leadership Experience	-0.25	0.97	-0.006	.025*	.191**	.169**	.166**	.172**	.066**	.065**	-.036**	-.041**	.037**	.045**	0.007	.029**	.061**	0.013	.040**	.045**	.037**	.031**	.031**	-0.018	0.02	.036**	.071**	.178**		
Part-Time Job	-0.54	0.84	-.036**	.299**	-0.01	-.028**	.040**	.050**	.048**	.028*	-.037**	.104**	.113**	.027*	0.003	0.007	.041**	-.037**	.039**	.043**	-0.005	0.012	.076**	.097**	.062**	0.003	.044**	.081**	.074**	

Appendix B
Questionnaire Protocols - Survey 1

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

1. Participant Information

Thank you for participating in our survey. Your feedback is important.
This research is being conducted **to explore the causes behind gender differences in self-confidence, leadership and Science, Technology, Engineering and Mathematics (STEM) career choices. The study aims to understand the process of self-confidence and leadership formation as well as how, when and why subject and career selection decisions are made. An outcome of the study is to help schools understand when and how to intervene to improve student outcomes in terms of the development of self-confidence, leadership and career choices. The research is being independently conducted by a research team from the UQ Business School.**
This research seeks to benefit you by **providing a means to confidentially share your insights and experiences into self-confidence, leadership and how you make subject and career decisions.** These insights will be analysed by the UQ research team, then summarised and reported back to your school with implications and recommendations, through an independently written report. We will also provide face to face presentations to the school, as requested by your school principal. The written report and a one-page summary of key findings will be made available to all students and parents through your principal. **Findings will be based on the combined responses of all students across your school and other schools participating in the research. No individual students who participate in the study will be identifiable.** At the school level, the study will provide the school executive with information and evidence about how best to assist students in acquiring self-confidence and leadership skills as well as data on the reasons behind STEM subject and STEM career avoidance.
This project is funded by the University of Queensland, with additional in-kind support from your school. **The two surveys will be conducted anonymously and at no stage will you be asked your name and nor will anyone seek to identify you individually.** The study comprises this online survey and the Career Compass Survey. This survey will take approximately 20 minutes to complete. The Career Compass Survey will take approximately 25 minutes to complete.
There are no right or wrong answers and you may choose not to answer individual questions in this survey. **Your responses will be completely anonymous, the research team will only require your student number at the start of each survey in order to match your two surveys together.** The data is collected online directly by the researchers and is not accessible by your school. The results will be stored in secured servers at UQ and will be password-protected. All records will be destroyed upon completion of the research. **Participation is voluntary and you may withdraw at any time without comment or penalty.**

1. Participant Details

School

Student Number

Year Level

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Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

2. General Self-efficacy

Please rate your responses to these statements from Never to Always

1. When I make plans, I am certain I can make them work

Never Sometimes Always

2. I get started on work when I should

Never Sometimes Always

3. If I can't do a job the first time, I keep trying until I can

Never Sometimes Always

4. When I set important goals for myself, I achieve them

Never Sometimes Always

5. I give up on things before completing them

Never Sometimes Always

6. I avoid facing difficult situations

Never Sometimes Always

7. If something looks too complicated, I will not even bother to try it

Never Sometimes Always

8. When I have something unpleasant to do, I stick with it until I finish it

Never Sometimes Always

9. When I decide to do something, I go straight to work on it

Never Sometimes Always

10. When I try to learn something new, I stick with it until I am successful

Never Sometimes Always

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CREATE CHANGE

Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

2. General Self-efficacy

11. When unexpected problems occur, I handle them well

Never Sometimes Always

12. I avoid trying to learn new things when they look too difficult for me

Never Sometimes Always

13. Failure just makes me try harder

Never Sometimes Always

14. I feel insecure about my ability to do things

Never Sometimes Always

15. I am a self-reliant person

Never Sometimes Always

16. I give up easily

Never Sometimes Always

17. I am capable of dealing with most problems that come up in life

Never Sometimes Always

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Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

3. Social Self-efficacy

Please rate your responses to these statements from Never to Always

1. It is difficult for me to make new friends

Never — Sometimes — Always

2. If I see someone I would like to meet, I introduce myself to that person instead of waiting for them to come to me

Never — Sometimes — Always

3. If I meet someone interesting who is hard to make friends with, I'll soon stop trying

Never — Sometimes — Always

4. When I'm trying to become friends with someone who seems uninterested at first, I soon give up

Never — Sometimes — Always

5. I am good at working in groups

Never — Sometimes — Always

6. I am good at making friends

Never — Sometimes — Always

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Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

4. Leadership and Social Development

1. What is your mother's current occupation?

2. Does your mother have a University degree?

- Yes
- No

If Yes, what is her degree in?

3. How many hours a week would you say your mother works at her job?

- 0-10 hours
- 11-25 hours
- 26-50 hours
- More than 50 hours

4. What is your father's occupation?

5. Does your father have a University degree?

- Yes
- No
- if Yes, what is his degree in?

6. How many hours a week would you say your father works at his job?

- 0-10 hours
- 11-25 hours
- 26-50 hours
- More than 50 hours

7. Who do you most admire in the world and would like to be like?

8. Why do you admire this person?

9. Have you ever done a leadership course or attended a leadership development program?

- Yes
- No

If Yes, briefly describe what kind of activity it was?

10. Do you have any leadership roles either at school, in sport or other activities?

- Yes
- No

If Yes, what are these roles?

11. Do you participate in any of the following activities and if Yes, how many hours a week do you spend on them?

	No	Yes 0-1 hour	Yes 1-2 hours	Yes 2-5 hours	Yes 5-10 hours	Yes more than 10 hours
Team sport (Netball, Football, Hockey etc)	○	○	○	○	○	○
Individual sport (Athletics, Tennis, Gymnastics, Surfing, Swimming etc)	○	○	○	○	○	○
Camping	○	○	○	○	○	○
Drama	○	○	○	○	○	○
Computer/Console gaming	○	○	○	○	○	○
Social Media (Facebook, Twitter, Instagram etc)	○	○	○	○	○	○
Fishing	○	○	○	○	○	○
Hiking/Orienteering/Walking	○	○	○	○	○	○
Arts and crafts	○	○	○	○	○	○
Riding (Horse, Bike)	○	○	○	○	○	○
Dance	○	○	○	○	○	○
Playing a musical instrument	○	○	○	○	○	○
Boating	○	○	○	○	○	○
Board/Role Playing games	○	○	○	○	○	○
Scouts, Girl Guides etc	○	○	○	○	○	○
Hanging out with my friends	○	○	○	○	○	○
Watching TV/Movies	○	○	○	○	○	○
Listening to music	○	○	○	○	○	○
Reading	○	○	○	○	○	○
Caring for brother/sister/parent/relative	○	○	○	○	○	○
Other	○	○	○	○	○	○

12. Of the above activities, are any undertaken without adult supervision or involvement (eg: parents coaches)?

- ○ Yes
- ○ No

If Yes, which activities are unsupervised or don't involve an adult ?

13. Do you have your own space at home for studying or doing homework?

- ○ Yes
- ○ No

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Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

4. Leadership and Social Development

14. How many hours would you spend on study at home each week on average?

- ○ 0-5 hours
- ○ 6-10 hours
- ○ 11-15 hours
- ○ 16-20 hours
- ○ 20-25 hours
- ○ more than 25 hours

15. What chores are you required to do at home?

16. How many hours would be taken up by chores at home each week on average?

- ○ 0-2 hours
- ○ 2-4 hours
- ○ 4-6 hours
- ○ More than 6 hours

17. What do you aspire to be in your future career?

18. Do you have a paid part-time job?

- ○ Yes
- ○ No

If Yes, how many hours a week do you work?

19. Over the last year, have you travelled and how many times did you travel...

	No	Yes 1-2 times	Yes 3-5 times	Yes more than 5 times
Outside Brisbane but inside Queensland	○	○	○	○
Interstate (outside Queensland but inside Australia)	○	○	○	○
Overseas (outside Australia)	○	○	○	○

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Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

4. Leadership and Social Development

20. What school subjects are you currently undertaking?

1.
2.
3.
4.
5.
6.
7.
8.

21. What three (3) school subjects are you really good at?

1.
2.
3.

22. What three (3) school subjects are you not very good at?

1.
2.
3.

23. What are three (3) school subjects do you wish you were a lot better at?

1.
2.
3.

24. What are three (3) things that you are really good at?

1.
2.
3.

25. What are three (3) things that you are not very good at?

1.
2.
3.

26. What are three (3) things that you wish you were a lot better at?

1.
2.
3.

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Exploring the Causes of Gender Differences in Self Confidence, Leadership and STEM Carer Aspirations B

5. Authentic Leadership

1. I can list my three (3) greatest weaknesses.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

2. My actions reflect my core values.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

3. I seek others' opinions before making up my own mind.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

4. I openly share my feelings with others.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

5. I can list my three (3) greatest strengths.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

6. I do NOT allow group pressure to control me.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

7. I listen closely to the ideas of those who disagree with me.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

8. I let others know who I truly am as a person.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

9. I seek feedback as a way of understanding who I really am as a person.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

10. Other people know where I stand on controversial issues.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

11. I do not emphasize my own point of view at the expense of others.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

12. I rarely present a "false" front to others.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

13. I accept the feelings I have about myself.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

14. My morals guide what I do as a leader.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

15. I listen very carefully to the ideas of others before making decisions.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

16. I admit my mistakes to others.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

Appendix C
Questionnaire Protocols - Survey 2

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CREATE CHANGE

Career Compass B

1. Participant Information

Thank you for participating in our survey. Your feedback is important.
This research is being conducted **to explore the causes behind gender differences in self-confidence, leadership and Science, Technology, Engineering and Mathematics (STEM) career choices. The study aims to understand the process of self-confidence and leadership formation as well as how, when and why subject and career selection decisions are made. An outcome of the study is to help schools understand when and how to intervene to improve student outcomes in terms of the development of self-confidence, leadership and career choices. The research is being independently conducted by a research team from the UQ Business School.**
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Participant Details

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2. Activity Preferences

There are thousands of jobs in the world. To help us find the areas of work that most interest you please rate the following activities. Think about how much these activities interest you and rate them from least interesting to most interesting.

Q1: Rate these activities from least interesting to most interesting

	Not at all interesting		Somewhat interesting		Very interesting
Designing electronic circuit boards	○	○	○	○	○
Identifying viruses in a lab	○	○	○	○	○
Writing magazine articles	○	○	○	○	○
Designing book covers	○	○	○	○	○
Helping unemployed people find jobs	○	○	○	○	○
Doing calculations for designing bridges	○	○	○	○	○
Working out he best stocks and shares to buy	○	○	○	○	○
Testing food for harmful bacteria	○	○	○	○	○
Organising help for families of people in hospital	○	○	○	○	○
Announcing programmes on radio or TV	○	○	○	○	○
Calculating flight speeds and planning routes for aircraft	○	○	○	○	○
Estimating the value of houses	○	○	○	○	○
Providing information on health and hygiene for the public	○	○	○	○	○
Planning colour schemes for the interiors of buildings	○	○	○	○	○
Interviewing people on TV or radio	○	○	○	○	○
Designing laser cutting machines	○	○	○	○	○

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Career Compass B

2. Activity Preferences

	Not at all interesting		Somewhat interesting		Very interesting
Producing designs for a toy manufacturer	○	○	○	○	○
Managing a branch of a bank	○	○	○	○	○
Giving guidance to people with personal problems	○	○	○	○	○
Testing people for problems in their eye muscles	○	○	○	○	○
Solving problems using maths	○	○	○	○	○
Designing clothes	○	○	○	○	○
Drawing up legal documents	○	○	○	○	○
Helping people who have been in accidents to walk again	○	○	○	○	○
Analysing water supplies for polution	○	○	○	○	○
Auditioning people for parts in a play	○	○	○	○	○
Choosing the best photographic angles for shots in films	○	○	○	○	○
Finding foster parents for children	○	○	○	○	○
Giving advice on buying and selling houses	○	○	○	○	○
Reporting international news events	○	○	○	○	○
Advising farmers on suitable crops for different soils	○	○	○	○	○
Working on the uses of microwaves in industry	○	○	○	○	○
Designing the style and appearance of household goods	○	○	○	○	○
Writing the wording for advertisements	○	○	○	○	○
Inventing new uses for fibre optic cables	○	○	○	○	○
Arranging child care for families	○	○	○	○	○
Developing chemicals to kill weeds	○	○	○	○	○

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2. Activity Preferences

	Not at all interesting		Somewhat interesting		Very interesting
Using statistics to plan pensions for a company	○	○	○	○	○
Writing reports on public meetings	○	○	○	○	○
Teaching children with hearing impairments to communicate	○	○	○	○	○
Organising how information is stored in an office	○	○	○	○	○
Carrying out tests on engines	○	○	○	○	○
Restoring old or damaged paintings	○	○	○	○	○
Studying the behaviour of animals	○	○	○	○	○
Designing machinery for processing gas	○	○	○	○	○
Helping people to find information in a library	○	○	○	○	○
Discussing sales plans with managers	○	○	○	○	○
Designing a poster to advertise a new CD	○	○	○	○	○
Cutting up plants and studying their structure	○	○	○	○	○
Counselling patients who have a mental illness	○	○	○	○	○
Painting pictures	○	○	○	○	○
Testing the strength of metals	○	○	○	○	○
Visiting sick and elderly people to find out what help they need	○	○	○	○	○
Estimating how well a new product will sell	○	○	○	○	○
Introducing speakers at meetings	○	○	○	○	○
Collecting and preserving different types of plants	○	○	○	○	○
Counselling students who are unwell or depressed	○	○	○	○	○
Drawing sketches for new buildings	○	○	○	○	○

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2. Activity Preferences

	Not at all interesting		Somewhat interesting		Very interesting
Giving talks and lectures	○	○	○	○	○
Drawing graphs to show what a company has produced and sold	○	○	○	○	○
Researching new ways of producing energy	○	○	○	○	○
Studying the causes of diseases	○	○	○	○	○
Reading novels and deciding which ones to publish	○	○	○	○	○
Designing postage stamps	○	○	○	○	○
Organising help for people after disasters such as earthquakes	○	○	○	○	○
Designing aeroplanes using maths and physics	○	○	○	○	○
Being the manager of a company	○	○	○	○	○
Studying the effects of pollution on the environment	○	○	○	○	○
Working out how to help children with behavioural problems	○	○	○	○	○
Being a language interpreter at conferences and meetings	○	○	○	○	○
Designing and building robots	○	○	○	○	○
Checking accounts to see if they are accurate	○	○	○	○	○
Doing research to see how well new medicines work	○	○	○	○	○
Animating cartoons for films	○	○	○	○	○
Writing novels	○	○	○	○	○
Calculating orbital heights and speeds of satellites	○	○	○	○	○
Designing and making costumes and scenery for plays	○	○	○	○	○

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Career Compass B

2. Activity Preferences

	Not at all interesting		Somewhat interesting		Very interesting
Working out how much tax people should pay	○	○	○	○	○
Investigating the causes of alcohol abuse	○	○	○	○	○
Analysing the effects of drugs and chemicals on animals	○	○	○	○	○
Studying the structure of atoms	○	○	○	○	○
Teaching drawing and painting	○	○	○	○	○
Giving companies advice on investing large sums of money	○	○	○	○	○
Looking into the reasons for young people staying away from school	○	○	○	○	○
Studying the use of bacteria for recycling waste	○	○	○	○	○
Deciding which articles will be printed in a newspaper	○	○	○	○	○
Planning landscape gardens	○	○	○	○	○
Organising training for people with learning difficulties	○	○	○	○	○
Giving legal advice	○	○	○	○	○
Planning TV or radio programmes	○	○	○	○	○
Investigating the chemistry of animal and plant cells	○	○	○	○	○
Designing computer systems for road traffic management	○	○	○	○	○
Organising art exhibitions	○	○	○	○	○
Choosing books for libraries	○	○	○	○	○
Supervising the construction of new buildings	○	○	○	○	○
Counselling people to help them cope when someone has died	○	○	○	○	○
Developing vaccines for immunisation against diseases	○	○	○	○	○

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Career Compass B

2. Activity Preferences

	Not at all interesting		Somewhat interesting		Very interesting
Forecasting economic trends	○	○	○	○	○
Collecting and preserving historical documents	○	○	○	○	○
Diagnosing and treating mental illnesses	○	○	○	○	○
Estimating the risks involved in insurance schemes	○	○	○	○	○
Analysing the chemicals in rock samples	○	○	○	○	○
Designing furniture	○	○	○	○	○
Giving people dental treatment	○	○	○	○	○
Drawing up plans for building engines	○	○	○	○	○
Writing scripts for radio programmes	○	○	○	○	○
Studying statistics on imports and exports	○	○	○	○	○
Planning new displays for museums	○	○	○	○	○
Studying how medical conditions are inherited	○	○	○	○	○
Treating people who have speech difficulties	○	○	○	○	○
Planning and carving sculpture	○	○	○	○	○
Developing new metal alloys	○	○	○	○	○
Helping families with problems to find houses	○	○	○	○	○
Preparing a yearly budget for a company	○	○	○	○	○
Writing reviews for plays	○	○	○	○	○
Diagnosing and treating illness in animals	○	○	○	○	○
Helping ex-prisoners to stop offending	○	○	○	○	○
Studying the painting techniques used by artists	○	○	○	○	○
Teaching drama	○	○	○	○	○
Studying the causes of inflation	○	○	○	○	○

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Career Compass B

3. Reasons for Working

To reach your goals it is sometimes necessary to study subjects that are important background for a job you may wish to train for, but that you may not necessarily enjoy at this stage of your schooling.

Q2: List six (6) school subjects that you think are important to study

1.
2.
3.
4.
5.
6.

"Work" relates to all tasks you perform in paid and unpaid activities. Everyone has different interests, abilities and needs and therefore different motivations regarding work. Earning money is a very important reason for most people to work, but there are many other reasons why people work.

Q3: Rate the following reasons for working from least important to most important

	Not very important to me		Somewhat important to me		Very important to me
Challenging	○	○	○	○	○
Use my talents	○	○	○	○	○
Helping others	○	○	○	○	○
Meeting people	○	○	○	○	○
Being independent/my own boss	○	○	○	○	○
Variety	○	○	○	○	○
Occupying my time	○	○	○	○	○
Enjoying the tasks I work on	○	○	○	○	○
Having the chance to travel	○	○	○	○	○
Having a secure job and income	○	○	○	○	○
Being recognised for my contribution	○	○	○	○	○
Working on my own	○	○	○	○	○
Being part of a team	○	○	○	○	○
Communicating orally, visually or in writing	○	○	○	○	○

Q4: From the list above, choose what you feel are the three (3) most important reasons for you to work?

Most important	
Second most important	
Third most important	

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4. Influences

Your career development will be influenced by your abilities, interests and motivation, but there will also be external influences.

Q5: Pick five (5) factors from the list below that you think might influence you most, then describe HOW they influence you?

- ☐ Parents
- ☐ Teachers
- ☐ Friends
- ☐ Siblings
- ☐ Media
- ☐ Job availability
- ☐ Location (where you live)
- ☐ Culture
- ☐ Beliefs
- ☐ Physical attributes
- ☐ Creative attributes
- ☐ Health
- ☐ Disability
- ☐ Personality
- ☐ Gender
- ☐ Academic success
- ☐ Mentor
- ☐ Internet/Social network

Influence 1 - choose from the dropdown menu

How does this factor influence you?

Influence 2 - choose from the dropdown menu

How does this factor influence you?

Influence 3 - choose from the dropdown menu

How does this factor influence you?

Influence 4 - choose from the dropdown menu

How does this factor influence you?

Influence 5 - choose from the dropdown menu

How does this factor influence you?

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Career Compass B

5. Abilities and Talents

What are you good at?

Q6: What three (3) school subjects are you best at?

1.
2.
3.

Q7: What are three (3) jobs that you think might make use of the skills learned in these subjects?

1.
2.
3.

Q8: List five (5) of your own personal attributes that you feel are most important?
(Eg: Honest, loyal, enthusiastic, team player etc)

1.
2.
3.
4.
5.

Appendix D
General and Social Self-Efficacy Questions

General Self-Efficacy

1. When I make plans, I am certain that I can make them work

2. I get started on work when I should

3. If I can't do a job the first time, I keep trying until I can

4. When I set important goals for myself, I achieve them

5. I give up on things before completing them

6. I avoid facing difficult decisions

7. If something looks too complicated, I will not even bother to try it

8. When I have something unpleasant to do, I stick with it until I finish it

9. When I decide to do something, I go straight to work on it

10. When I try to learn something new, I stick with it until I am successful

11. When unexpected problems occur, I handle them well

12. I avoid trying to learn new things when they look too difficult for me

13. Failure just makes me try harder

14. I feel insecure about my ability to do things

15. I am a self-reliant person

16. I give up easily

17. I am capable of dealing with most problems that come up in life

Social Self-Efficacy

1. It is difficult for me to make new friends

2. If I see someone I would like to meet, I introduce myself to that person instead of waiting for them to come to me

3. If I meet someone interesting who is hard to make friends with, I'll soon stop trying

4. When I'm trying to become friends with someone who seems uninterested at first, I soon give up

5. I am good at working in groups

6. I am good at making friends

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[i]An important point for readers: Our total usable sample consisted of 9, 465 boys and girls out of 10, 076 surveyed. As with all field data, without the possibility of creating experimental/lab conditions there is propensity for missing data. Interestingly, despite expectations of incomplete student responses, missing variable analyses show that <20.9% of data was missing for our measures within which there was the highest proportion of data missing. This is well within acceptable parameters in best-practice applied research. As a result, we adopt pairwise deletion method throughout analyses which means that while some participants may not respond to a certain question, their data for questions that are completed is still utilised within subsequent analyses. Finally, while there were some outliers identified within the sample this was <4% of responses on those variables that showed exaggerated responses (e.g., hours dedicated to chores).

[ii]Focal variables (e.g., Gender, Year, Activities, Leadership Development Actions, Part-Time Job, etc.) were evaluated in terms of missing data and coding errors. Provided in the following table, is the results of this analysis. Variables with MVAs >5% (a cut-off considered adequate within academic studies) remain included due to the nature of data (e.g., not all activities will appeal to all students).

Table 18., Missing Variables & Coding Errors/Outliers Analysis for Survey 1

Variable	Number of Responses	Range Min – Max	% of Missing Data
Gender	9465	-1 – 1	0
Year	9416	7 – 11	0.5
Team Sport	8683	0 – 4	8.26
Individual Sport	8449	0 – 4	10.73
Camping	8414	0 – 4	11.10
Drama	8327	0 – 4	12.02
Gaming	8720	0 – 4	7.87
Social Media	8510	0 – 4	10.09
Fishing	8445	0 – 4	10.78
Hiking / Orienteering	8444	0 – 4	10.79
Arts & Crafts	8445	0 – 4	10.78
Riding (e.g., horse, bike)	8509	0 – 4	10.10
Dance	8493	0 – 4	10.27
Playing a Musical Instrument	8422	0 – 4	11.02
Boating	8413	0 – 4	11.11
Board Games	8590	0 – 4	11.69
Scouts / Girl Guides	8590	0 – 4	9.24
Spending time with Friends	8655	0 – 4	8.56
Watching TV	8644	0 – 4	8.67
Listening to Music	8618	0 – 4	8.95
Reading	8562	0 – 4	9.54
Other	7591	0 – 4	19.80
Leadership Education	8811	-1 – 1	6.91
Leadership Experience	8762	-1 – 1	7.43
Part-Time Job	8874	-1 – 1	6.24
Intrastate Travel	8252	-1 – 1	12.82
Interstate Travel	8130	-1 – 1	14.10
Overseas Travel	8177	-1 – 1	13.61
Overall Efficacy	9464	1 – 9	0.03
General Efficacy	9462	1 – 9	1.32
Social Efficacy	9340	1 – 9	0.01

[iii]To evaluate the relationships between the types of activities we surveyed, means, standard deviations and correlations were calculated and are presented within Appendix A.

[iv]Scale reliabilities (e.g., Cronbach's **α**) were calculated for Overall (**α** = .89); General (**α** = .88) and; Social Efficacy (**α** = .74). Importantly, the original 6-item measure of social efficacy (**α** = .50) suggested that the item "When I'm trying to become friends with someone who seems uninterested at first, I soon give up" did not load onto the social efficacy construct being measured. This item was dropped from subsequent analyses.

[v]The link between activities and self-confidence outcomes was tested using a series of regression analyses. This permits researchers to tease apart the extent to which changes in each predictor (e.g., activities we included in the model) result in changes in self-confidence reported by students.

[vi]We calculate overall efficacy by creating a mean of all social and general efficacy items.

[vii]Quantitative data examining the nature of these relationships (e.g., the link between children's activities and the self-efficacy outcomes they report) remains under-reported. However, past work with Australian men and women CEOs suggests positive links between certain activities during schooling and subsequent leadership success. Given the inductive nature of this past research, we were uncertain about the order of importance between clusters of variables (e.g., types of travel, leadership experience or education, etc.). In light of this, we simply incorporated all activities of interest into the regression model at Step 1. The results we report are subsequently based on this decision and may mean that subsequent models may specify variable order on the basis of evolving evidence that inform future iterations of this research.

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