



Alliance of
Girls' Schools
Australasia

The Girls' School Edge

A review of the research literature on single-sex education for girls





SINGLE-SEX OR CO-EDUCATIONAL SCHOOLING: WHICH IS BETTER FOR GIRLS?

Choosing the right school for your daughter is one of the most difficult decisions to make, and regardless of her age or stage of schooling the stakes are high.

Debate on the choice between single-sex and co-educational schools often focuses on academic outcomes, ignoring the many other equally important factors that contribute to a good education. Countless studies have shown that a girl's school experience can influence her social and emotional wellbeing as well as her academic outcomes.

Making the right choice for your daughter's education doesn't just benefit her while she's attending school, it can shape her future choices and set her up for life success.

Navigating the sea of education information, opinions and anecdotal experiences can be intimidating. We've reviewed the wealth of research from around the world and compiled it in this report to help you make an informed decision on what's best for your daughter. It covers important areas such as academic outcomes, wellbeing and belonging, and also some less obvious considerations such as participation in sport and STEM (Science, Technology, Engineering and Maths) subjects, confidence and gender stereotyping.

You want your daughter to build resilience and self-esteem, to be happy and confident in an environment where she is free to be herself — free of stereotyping, bullying and harassment. You want her to grow and flourish not just at school but throughout her life, and an all-girls school may be the surest path to make that happen. But don't take it from us, let the research show you.

Her wellbeing: being herself

Girls feel more comfortable, self-assured and supported in an all-girls environment, which in turn encourages confidence, resilience and higher levels of participation in all aspects of school life. Girls' schools specialise in girls — tailoring every aspect of every program to girls, purposefully developing their confidence and potential, and empowering them to pursue whichever direction their talents lead them.

Several studies investigating the impact of all-girl environments have trialled all-girl classes in co-educational schools. While these studies highlight the impressive classroom benefits of all-girl learning environments, they ignore the wider benefits provided when all-girl classrooms are coupled with all-girl campuses — and these can be life changing for a girl.

American researcher Laura Hart (2015) found that all-girl classes help girls through the critical middle school years when they are struggling with social interactions relating to adolescence. The three-year study found that "student satisfaction with school was significantly higher for participants in the single-gender group".

In Australia, a year-long trial of single-sex Year 7 classes at a Queensland primary school found, comparatively, that girls remaining in the mixed-sex classes reported reduced scores on emotional and behavioural engagement, suggesting that girls were "negatively affected" by the "presence of boys in the classroom" (Gilmore, Patton, McCrindle & Callum, 2002).

Her safety: there's less bullying and greater respect

An atmosphere of respect, with significantly less bullying, encourages girls' school students to speak up in class, to take healthy risks with their learning, ask questions, share their views, and participate in subjects and activities that are usually dominated by boys in co-ed schools, such as higher level maths and science, IT, coding and robotics.

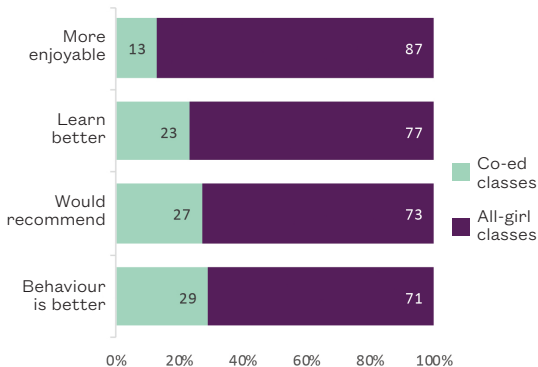
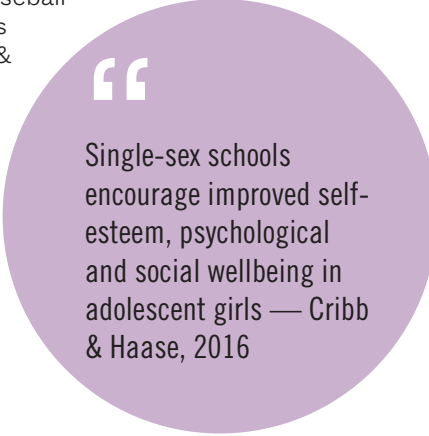


FIGURE 1: GIRLS PREFER ALL-GIRL CLASSES, ADAPTED FROM HART, 2015 (DATA FROM A TRIAL CONDUCTED IN A CO-ED SCHOOL)

An American study found that less than one per cent of female students in single-sex schools experience bullying, compared with 21 per cent of female students in co-ed schools. In addition, girls at single-sex schools are "significantly less likely to be bullied" for preferring 'masculine' sports (including football, baseball and basketball) over 'feminine' sports and activities (including softball, choir and art classes) (Johnson & Gastic, 2014).

Similarly, a Korean study found a lower frequency of aggressive behaviours in girls' schools, suggesting that the presence of boys may lead to increased bullying in boys' and co-educational schools (Gee & Cho, 2014).

Analysis of Australian and New Zealand data from the OECD's Programme for International Student Assessment (PISA) in 2015 and 2018



Single-sex schools encourage improved self-esteem, psychological and social wellbeing in adolescent girls — Cribb & Haase, 2016

conclusively demonstrates that the incidence of bullying for girls in single-sex schools is markedly lower than for girls in co-educational schools across all six PISA measures of bullying — including being made fun of, being the subject of nasty rumours, or being pushed or hit — with a difference of up to 11 percentage points (MMG, 2020).

Her voice: there's no place for inequality

Sexism and misogyny are commonplace in co-ed schools and the often-used excuse of “boys will be boys” establishes ingrained beliefs. Girls learn that their rights and feelings are not important — or at least, not important enough to justify curtailing boys’ inappropriate behaviours. Girls who complain or report these behaviours in a co-ed environment are often viewed as oversensitive and disengaged from reality — and this pattern continues from school into the workplace.

It’s easy to dismiss the existence of gender inequality if you have no lived experience of gender bias or discrimination. Most women can identify what it’s like to be treated negatively because of their gender, and statistics on the gender pay gap, the underrepresentation of women in leadership positions and violence against women are well documented. Girls’ schools don’t shelter girls from inequality. In fact, quite the opposite. Girls are intentionally “equipped with the knowledge and skills required to overcome social and cultural gender biases and in doing so actively break the stereotypical norms that define women in society” (Archard, 2018).

A 2016 Australian study of five co-educational schools confirmed previous findings that sexual bullying behaviours are commonplace within co-educational schools (Shute, Owens & Slee, 2016).

This is supported by evidence from a 2015 report by Britain’s Institute of Physics, *Opening Doors*, which found that sexist language was often dismissed as “harmless banter” in co-ed schools, although many girls did not see it as such, and that “in extreme cases, it verged on bullying”.

Even more concerning, a 2016 inquiry by a committee of the British Parliament found that girls in co-ed high schools are subjected to daily sexual harassment, including unwanted sexual touching and sexting, and are the victims of implicit bias by teachers who steer girls away from ‘hard’ subjects like advanced maths, physics and computer science (Commons Select Committee, 2016).

Her self-image: confident, competitive and fearless

Raising a confident, self-assured daughter who is comfortable with her body image is not an easy thing to do these days. From the time she’s a toddler, a girl is bombarded with media and other cultural messages that undermine the kind of healthy, resilient self-image you want her to develop.

Studies have repeatedly shown that single-sex environments build confidence and self-worth for women and girls.

A 2018 Korean study found that girls in co-educational high schools are more likely to fast, diet

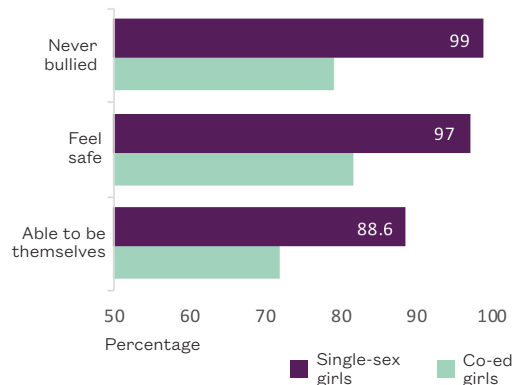


FIGURE 2: GIRLS FEEL SAFE AND SUPPORTED, ADAPTED FROM HOLMGREN, 2014 AND JOHNSON & GASTIC, 2014

or self-induce vomiting than girls attending single-sex high schools (Kim et al., 2018). Similarly, a British study found that girls in co-educational schools have lower self-esteem and feel more pressure to be thin than girls in single-sex schools (Cribb & Haase, 2016), while an American study found that young women at a women’s college (university) had more positive body ideals than young women at a mixed-sex college (Spencer, Barrett, Storti & Cole, 2013).

Cribb and Haase (2016) concluded that single-sex schools encourage “improved self-esteem, psychological and social wellbeing in adolescent girls”, while Spencer et al. (2013) suggested that all-girl environments empower girls, encourage positive self-image and counter gender stereotyping, helping to protect young women from the pressure to be thin.

The presence of males also has a negative effect on women’s competitiveness and participation across the board, from academic studies and career promotion to sporting activities. In single-sex environments, without the presence of boys, girls are free to participate, have fun, compete and excel without worrying about what they look like or what boys might think or say.

An experiment involving financial risk found that girls from a single-sex school were more competitive than girls from a closely matched co-educational school and equally as competitive as boys at the co-educational school (Laury, Lee & Schnier, 2019).

In similar experiments, Booth, Cardona-Sosa and Nolen (2014) found that female students assigned to single-sex university classes acted “significantly” more competitively than females in co-ed classes.

The impact of female role models may also lead to greater confidence and competitiveness in girls at single-sex schools. Cherney and Campbell (2011) found that girls at single-sex schools, who predominantly had female mathematics and science teachers, “had significantly higher self-esteem and higher achievement motive”, and also achieved higher test scores in mathematics, than girls in co-ed schools.

The 2018 study, *Hands Up For Gender Equality*, found that Australian girls educated in single-sex schools are equally as self-confident as boys educated in single-sex schools. This 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” (Fitzsimmons, Yates & Callan, 2018).

This self-confidence allows girls to thrive, be bold in their choices and unafraid to experiment as demonstrated by Fisher, Lang and Forgasz (2015) who found that girls gain confidence in single-sex Information Technology (IT) classes. Feedback from girls included that girls-only IT classes were more conducive to learning because boys disrupted classes and put girls down when they were trying to do something or express an idea. Girls also said that they were more willing to ask for help, more confident, and not afraid to try things out without boys being present.

Her participation and enjoyment: from pursuing science to playing sport

Students learn better and are happier when they are engaged with their learning — and we know that girls are more engaged in their learning and enjoy classes more in all-girls schools.

In girls’ schools, girls feel less self-conscious and have a greater sense of belonging, whether it is in the science lab or on the rugby field. Unsurprisingly, multiple studies find that girls prefer and have higher participation rates in all-girl physical activities including PE classes, team sports, fitness activities and outdoor education.

Mixed-sex sporting activities reinforce existing gender stereotypes (men are ‘faster’ and ‘stronger’, women are ‘slower’ and ‘weaker’), leading to females being relegated to supporting roles or discouraged from taking part at all. In addition, research demonstrates that, especially during adolescence when girls are highly conscious of body image and weight, they are reluctant to wear physical education (PE) uniforms or take part in PE classes and sporting activities with boys.

Getting girls more involved in physical education and sport, as well as in STEM, has been a global concern for many years, and girls’ schools are achieving not only high levels of participation in both these areas, but also higher levels of engagement and enjoyment.

In co-educational schools girls have lower STEM participation rates and lower STEM aspirations compared with girls in girls’ schools. A study of Australian data by Kieu My Tran found that single-sex environments have a positive impact on girls through encouraging them to take more male-dominated subjects than girls in co-ed schools. In particular, girls from single-sex schools who achieve highly in maths are more likely to choose male-dominated

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Girls-only IT classes were more conducive to learning because boys disrupted classes and put girls down — Fisher et al., 2015



STEM subjects than girls from co-ed schools who are similarly good at maths.

Participation and enjoyment of STEM subjects ultimately leads more girls to pursue further study and careers in STEM. In both Australia and New Zealand graduates of girls’ schools are significantly more likely to enter highly-paid male dominated fields such as engineering and construction than girls graduating from co-educational schools (Tully & Jacobs, 2010; Docherty et al., 2018; Carnemolla, 2019).

An analysis of 2015 PISA data, which focused on science, revealed that girls in girls’ schools outperform girls from co-educational schools on multiple measures of science knowledge and enjoyment (MMG, 2020).



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 Carnemolla, 2019

Her science confidence: positive beliefs and attitude

Why are we so concerned about STEM and girls’ participation in these subjects? Analysis by the Department of Jobs and Small Business (2019) shows that jobs in STEM are growing significantly faster than other occupations. STEM jobs are also highly skilled and highly paid, with 73 per cent requiring a bachelor degree or higher — yet, with the exception of health and biological sciences, women remain underrepresented in STEM fields. Of course not every girl (or boy) wants a STEM-based career but making sure she has equal encouragement and opportunity to pursue the career of her choosing is vital. In a co-educational environment girls can be deterred from STEM at an early age — girls as young as six feel less confident about their maths ability than boys — and this can severely limit their subject choices, tertiary studies and career options.

According to the 2015 *Opening Doors* report by Britain’s Institute of Physics, many co-educational schools have been “inadvertently reinforcing the notion that certain subjects” are “harder than others”; that girls “lack ability” and “innate talent” in certain subjects; and that this is “particularly true for girls contemplating mathematics and the physical sciences”.

A 2015 study by Kester Lee and Judy Anderson from the University of Sydney found that girls in single-sex schools are the most positive of all students, followed by boys in single-sex schools, then co-educational boys and finally co-educational girls. Lee and Anderson concluded that, for girls, “single-sex settings resulted in much more favourable attitudes towards mathematics than those in coeducational settings”.

Similarly, a 2016 report by Chris Ryan of the Melbourne Institute of Applied Economic and Social Research confirms that, by Year 8, girls in single-sex schools are more likely to enjoy and be confident in mathematics than girls in co-educational schools.

These positive attitudes towards STEM subjects carry on into the senior years at girls’ schools, with a report by Monash University academics finding that girls attending single-sex schools in Victoria were up to 85 per cent more likely to study chemistry, intermediate maths, advanced maths and physics in their senior years when compared to their co-ed counterparts (Forgasz & Leder, 2017).

Research from Europe echoes these benefits for girls attending single-sex schools, with a 2015 study from Switzerland identifying a “very robust” positive effect on mathematics proficiency for girls. Girls in single-sex classes also “evaluate their mathematics skills more positively and are more likely to attribute their performance in mathematics to their own efforts rather than to exogenous talent or luck” (Eisenkopf, Hessami, Fischbacher & Ursprung, 2015).

Her academic success: higher aspirations and better outcomes

While academic results should never be considered the sole measure of a good education, they are of course an important indicator of success.

In recent years there has been much made about gender differences seen in academic results, university enrolments and career pathways. However, numerous research studies from around the world demonstrate that students in single-sex schools benefit academically from a learning environment free from gender stereotyping, unconscious bias and social pressure.

While it is often argued that single-sex schools do well because of the high socioeconomic status (SES) of their students, rigorous studies from multiple countries have found a significant academic advantage for students at single-sex schools even after accounting for socioeconomic background.

When analysing the results of a comparable group comprising girls from the top 25 per cent of SES backgrounds in Australia and New Zealand, girls from girls' schools outperformed girls from co-educational schools on all academic measures — science, mathematics and literacy (reading) — reported by PISA in 2015 and 2018 (MMG, 2020).

Likewise, a 2017 study of Year 3, 5 and 7 numeracy and literacy (NAPLAN) data found that boys and girls at single-sex schools achieve higher scores than co-ed students even when socioeconomic status is taken into account. Year 7 girls at single-sex schools were 4.2 terms ahead of co-ed students in reading and 2.8 terms ahead in mathematics (Dix, 2017).

A 2014 report by Lucy Lu and Karen Rickard examining NAPLAN and tertiary entrance score data for students attending government single-sex high schools in New South Wales also “confirmed the positive effects of single-sex schooling” on these academic measures after taking account of factors including socioeconomic background.

Similar results were found by Gemici, Lim and Karmel (2013) who wrote that single-sex schools, “do better” when it comes to tertiary entrance scores and that this is consistent with previous research. In fact, two-thirds of all schools they categorised as “high-performing” schools were single-sex.

In New Zealand, a longitudinal study of 668 children found there was a “pervasive tendency for children attending single-sex schools to have a greater success in the School Certificate examinations”, as well as higher reading scores, “greater school retention, less likelihood of leaving school without qualifications and less exposure to unemployment than children attending coeducational schools” (Woodward, Fergusson & Horwood, 1999).

Ten years later, Gibb, Fergusson and Horwood (2008) found there was a “substantial and significant gender gap” between males and females in co-educational schools in New Zealand, but that in single-sex schools there was no significant difference between the academic achievement of boys and girls. In addition, the effects of single-sex schooling extended to university outcomes.

Further afield, a unique study led by Christian Dustmann, Professor of Economics at University College London, found that converting educational environments in South Korea from single-sex to co-ed leads to falling academic results for both boys and girls, but particularly for girls. The study also showed that boys and girls in single-sex schools outperformed their co-ed counterparts on university entrance academic tests (Dustmann, Ku & Kwak, 2017).

These results are consistent with research from the United Kingdom, including a 2009 study of 700,000 girls by the Good Schools Guide which found that girls in all-girl comprehensive (non-selective) schools achieved better results than those who attended co-educational secondary schools. In addition, a 2007 government-backed review in the UK recommended that girls and boys should be taught separately to avoid girls being pushed aside in mixed-sex classrooms (Hannay, 2016; Paton & Moore, 2009).

Interestingly, in the United States single-sex education is the fastest growing trend in the 21st century education landscape. A large body of American research has found that single-sex classes and schooling have led to higher academic outcomes for low-income and minority girls and boys, contributing to the rapid increase in the number of single-sex schools and classes across the US (National Center for Education Statistics [US], 2015-2016; Anderson, 2015).

Her future: aspirations, career and leadership

Research shows that girls who attend single-sex schools are more likely to achieve well at school, be confident of their academic ability, and aspire to graduate and postgraduate study — all of which are highly advantageous in the development of their careers and leadership potential.

Girls taking part in an Australian study exploring leadership attitudes believed their single-sex school was teaching them to be strong, independent leaders and predicted that their confidence would be worse in a mixed sex environment where they may not be encouraged to pursue leadership roles (Archard, 2012).

Watson, Quatman and Edler (2002) found that girls at single-sex schools had higher real career aspirations than girls at co-educational schools. Career aspirations remained steady and high for many years among girls at single-sex schools but in co-educational schools, ideal and realistic career aspiration scores dropped significantly during the secondary years. Referring to single-sex schools, the researchers concluded that “when girls become the focal point, they rise to a greater level of development than might otherwise ordinarily be the case”.

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Girls in single-sex schools are the most positive of all students — Lee & Anderson, 2015

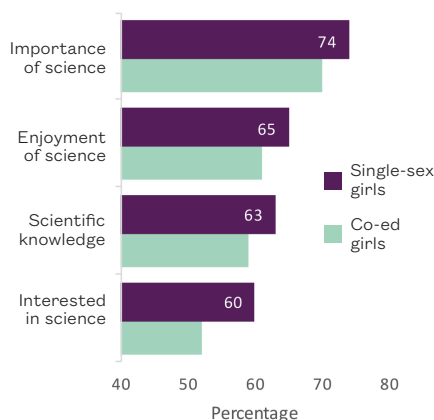


FIGURE 3: GIRLS' VIEWS ON SCIENCE, ADAPTED FROM MMG, 2020

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Girls at single-sex schools were 4.2 terms ahead of co-ed students in reading and 2.8 terms ahead in mathematics — Dix, 2017

A US study of schools in Texas found that girls from all-girl schools showed stronger academic performance in maths and science in both middle school and high school than girls from co-ed schools. They also received less formal discipline for poor behaviour and were more likely to enrol in universities and four-year colleges. Girls in the study were closely matched on an array of background characteristics including demographics and academic performance in primary school (Pustejovsky, 2019).

A 2018 University of California, Los Angeles (UCLA) study of nearly 6,000 incoming female university students found that graduates of all-girl schools are more likely to show higher levels of science self-confidence. They are also more likely to consider themselves to be critical thinkers, score higher on measures of academic habits of mind, and demonstrate stronger study habits than female graduates of co-ed schools. In addition, graduates of girls' schools are more likely to be involved in volunteering and community activities, take part in political activities, be supportive of environmental and societal improvements, and believe that promoting racial understanding is a "very important" or "essential" goal (Riggers-Piehl, Lim & King, 2018).

Single-sex classes at university also inspire higher academic and career goals, with a UK study finding that first-year female students at Essex University benefitted from being randomly assigned to all-

female tutorials in an introductory economics course. Students in the all-female tutorials achieved higher exam marks, were more likely to complete their degree, and more likely to be awarded a higher-classification degree than female students randomly assigned to co-ed tutorials (Booth, Cardona-Sosa & Nolen, 2013).

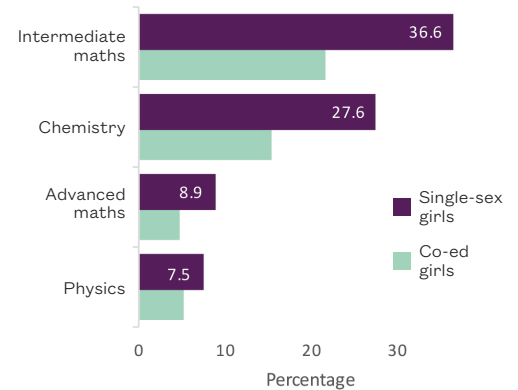


FIGURE 4: GIRLS' PARTICIPATION IN SENIOR SCIENCE, ADAPTED FROM FORGASZ & LEDER, 2017

SINGLE-SEX EDUCATION IS BETTER FOR GIRLS

In 2014, Professor Alison Booth, summarising her many studies in this area, wrote in the Sydney Morning Herald that "the evidence is gathering that women in single-gender classes benefit, and they benefit significantly". Since that time new research has added further strong support for the benefits of all-girls schools.

Study after study has shown that girls from single-sex schools are more willing to take healthy risks, ask questions, make mistakes and be involved — skills that are advantageous for life success. Why is this the case? The factor that distinguishes girls' schools from co-educational schools is that there are no boys in the classroom to distract, discourage or intimidate girls from their learning.

Girls' schools create learning environments and experiences that shape girls' self-concept, helping them to overcome the gender biases and stereotypes that are rife in our society. In every lesson, every programme and every opportunity — from leadership positions and girl-centric wellbeing programmes, to single-sex physical education lessons and sporting activities — single-sex schools bolster girls' confidence and self-esteem. Yes, girls can achieve excellent academic results in a co-educational school, but in a girls' school there are no gender stereotypes, no appearance pressures, no sexual harassment, and no barriers to participation — in fact, every aspect of school life is designed and tailored for girls.

While 20th century theories of the 'pink brain, blue brain' genre have been disproved by neuroscience, girls are still disadvantaged by a socialisation process that results in gender discrimination and both conscious and unconscious gender bias. Whether it is parents paying their sons more pocket money than their daughters, teachers discouraging girls from pursuing male dominated subjects and careers, or the sexualisation of girls and women by the media, by the time they are teenagers, girls' self-confidence, self-worth and self-efficacy have been eroded.

Supporters of co-educational schools often argue that the 'real world' is mixed-gender and therefore schools should be co-educational too. However, the 'real world' is also one where girls (and women) are still not equal. Educating girls in a safe and supportive environment — where belief in their own unlimited potential is so successfully instilled — allows them to grow and aspire to be strong, bold and fearless women who will demand inclusion, stand up for equality in all aspects of society, and believe anything is possible.

References

For full APA referencing of studies and quotes, including an extensive list of references, please visit the Alliance website: <https://www.agsa.org.au/why-a-girls-school-the-research/>



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