



Gender Differences in School Effects on Adolescent Life Satisfaction: Exploring Cross-National Variation

Jose Marquez¹

Accepted: 10 May 2023 / Published online: 21 June 2023
© The Author(s) 2023

Abstract

Background Levels and drivers of adolescent life satisfaction (LS) vary across nations. School is known to be an important aspect of life affecting adolescent LS, but there are gender differences in how schools may influence LS. However, little is known about how these gender differences vary across countries.

Objective A series of statistical analyses (bivariate associations, multilevel regression, and Blinder-Oaxaca decomposition analyses) using PISA 2015 data on 15-year-old students in 33 countries.

Method A series of statistical analyses (bivariate associations, multilevel regression, and Blinder-Oaxaca decomposition analyses) using PISA 2015 data on 15-year-old students in 33 countries.

Results Girls report lower overall LS than boys on average in all the countries studied. Various cross-national patterns emerge regarding the role of schools. Although school is a life domain in which experiences related to overall LS tend to be more negative among boys than among girls (mainly via bullying and relationships with teachers), the opposite is observed for a few school-related factors (notably school anxiety). Furthermore, in some countries, the gender gap in overall LS varies across schools, which suggests that schools would play an important role in shaping students' LS in different ways for girls and boys. Despite some cross-national patterns, substantial cross-country variation is also observed.

Conclusion The study of adolescent LS in schools may benefit from more nuanced approaches that account for cross-cultural differences in how schools may promote the subjective well-being of girls and boys in different ways.

Keywords Life satisfaction · Subjective well-being · Gender · Education policy · Adolescence

There has been increasing interest in subjective well-being over the last few decades, not only in academia but also in the policy arena (Diener et al., 2018; Stiglitz, 2009). Subjective well-being has been conceptualised as a person's evaluation of his or her life in two dimensions -cognitive and affective (Diener et al., 2002). The cognitive element involves

✉ Jose Marquez
jose.marquez@manchester.ac.uk

¹ Manchester Institute of Education, University of Manchester, Manchester M13 9PL, UK

the assessment of satisfaction with life as a whole (i.e. overall life satisfaction (LS)) or with a particular aspect of life, and the affective aspect refers to emotions, moods and feelings, which can be positive (e.g. confidence, joy, affection, etc.) and negative (anxiety, shame, anger, etc.).

Interest in adolescent LS has been growing for some time now, especially in the school context (Taylor et al., 2022). There are various reasons for this. Adolescent LS and mental health have been deteriorating in many countries for two decades now (Marquez & Long, 2020; McManus et al., 2019; Mojtabai et al., 2016). Moreover, research indicates that higher LS in adolescence predicts important outcomes later in life, including adult subjective well-being and mental health, physical health and health behaviour, relational, labour market and socioeconomic outcomes (Cavioni et al., 2021; DeNeve & Oswald, 2012; Goodman et al., 2015; Guzmán et al., 2020; Kansky et al., 2016; Marquez et al., 2022; Richards & Huppert, 2011). Furthermore, LS starts to decline in early adolescence, which is considered a key window opportunity for intervention (Casas & Gonzalez-Carasco, 2019), and school is widely recognised as one of the most important policy-amenable aspects of adolescents' lives when it comes to supporting LS (Marquez & Main, 2020; Taylor et al., 2022).

Research on how schools and factors in the school context may influence adolescents' LS in different ways for boys and girls is scarce, but there is empirical evidence –and theoretical support – suggesting gender differences. Importantly, international comparative research shows that levels and drivers of adolescent LS may vary substantially across nations. However, research investigating cross-national differences and similarities in how schools may influence adolescent LS in different ways for boys and girls is almost non-existent. By exploring this question, the present study will advance our knowledge in this area and help decision-makers and relevant stakeholders make better-informed decisions on how to support adolescent LS.

Gender Differences in School Influences on Adolescent Subjective Well-being

Adolescence is a stage characterised by multiple changes in social roles, relationships, and the adoption of responsibilities (Arnett, 2007; Tanner & Arnett, 2016), as well as biological and psychosocial changes that affect males and females differently (Salmela-Aro, 2011). Gender differences in adolescent development are shaped by social, biological and cognitive influences, and manifest in a range of areas –abilities and interests, self-concept, social relationships, aggression, depression, etc. (Perry & Pauletti, 2011). For example, girls tend to be more “people oriented” and boys more “things oriented” (Galambos et al., 2009; Su et al., 2009). Similarly, compared to boys, girls tend to have lower self-esteem (Bang et al., 2020) and be more dissatisfied with their body image (Rees & Main, 2015).

In view of these gender differences in how adolescents experience different aspects of their lives, it is not surprising that gender differences are commonly found in adolescent LS research. In a review of the field, Chen et al. (2020) conducted the first meta-analytic study on gender differences in adolescents' LS, considering 46 studies from 1980 to 2017. This analysis revealed small gender differences in favour of boys for overall LS (i.e. boys were slightly more satisfied with their life as a whole than girls). However, when considering satisfaction with specific life domains, boys report higher satisfaction than girls in some domains (self-image, self-confidence, appearance, body, health and free time) and lower in

others (school and relationships with family and peers tends to be greater among girls than among boys) (Chen et al., 2020; Kaye-Tzadok et al., 2017; Rees et al., 2012; Verkuyten & Thijs, 2002). School was the domain with the largest gender differences. That satisfaction with school is higher among girls than among boys is not surprising considering the large body of research showing that girls and boys have rather different experiences in relation to school. The literature has widely reported on boys' lower academic outcomes and disliking of school (Halpern, 1997; Kessels et al., 2014; Kirikkaya, 2011; Martino, 1999; Millard, 1997; Ofsted, 2009); lower motivation, expectations, enthusiasm about expanding their studies in the future and a smaller amount of time devoted to doing homework (Cox, 2000; McCoy & Banks, 2012; Warrington et al., 2000); more restless and less gregarious attitude at school (Liu et al., 2016); and a greater propensity to having more conflicting relationships with teachers (Hughes & Im, 2016).

Despite the overall finding in Chen et al.'s (2020) meta-analysis that, compared to boys, girls tend to report lower overall LS but higher school satisfaction, the associations between school, gender and adolescent LS is more nuanced in view of some recent studies. Three elements define this complexity. First, how school is conceptualised and studied (i.e. as a unique domain or as a set of sub-domains) matters. In a study using a sample of 11 to 14-year-olds in 15 countries, Casas and Gonzalez (2017) examined the 'two worlds' hypothesis (Casas et al., 2013, 2014), which states that children conceive school as two separate domains: one of them involving learning, teachers and achievements, and the other one involving peers and friendship. The authors found gender differences in satisfaction in these domains and how they relate to overall LS, with classmates-related school satisfaction displaying a much higher contribution to overall LS among boys and learning-related school satisfaction displaying a slightly higher contribution among girls. The second element is age. LS (including overall LS and satisfaction with school) starts to decline in early adolescence and there is evidence that this decline may be greater among girls (Casas & Gonzalez, 2015; Currie et al., 2012; Gonzalez-Carrasco et al., 2017; Rees & Main, 2015). In the United Kingdom, a more nuanced analysis considering multiple school domains revealed that satisfaction with various aspects of school is the lowest at ages 12–16 compared to ages 8 to 11 and 17 to 18 (The Children's Society, 2022), although research on how this may differ by gender and relate to overall LS and other subjective well-being measures is lacking. And the third element is the socio-cultural context. There are good reasons to believe that the associations between gender, school and adolescent LS may vary across nations. This is discussed next.

Assessing Cross-National Variation in Adolescent Subjective Well-being

Differences across countries are common in adolescent LS research (Dinisman & Ben-Arieh, 2016; Klocke et al., 2013). Interestingly, whereas cross-country differences in mean levels of adult LS are mostly explained by nation-level characteristics (Helliwell et al., 2015), for children and adolescents, these differences are mainly due to factors in the close environment, this is home, school and community (Lee & Yoo, 2015). International comparative research has also shown that the relative importance of these factors in the shaping of adolescent LS varies considerably from country to country (Bradshaw & Rees, 2017; Lee & Yoo, 2015). However, how this may differ by gender is yet to be studied in detail.

Why should we expect to find cross-national variation in gender differences in correlates of adolescent LS? Kaye-Tzadok et al. (2017) argue that gender differences in LS may be dependent on the location of the particular study because, as a social construct,

gender differences depend on prevailing social norms in each society. This has been supported by findings that gender differences in how distinct factors are associated with child and adolescent LS may vary across countries. For instance, Rees and Main (2015) found important cross-national variation in the association between gender and LS, both in terms of the strength and the direction of this association. Moreover, the authors noted that satisfaction with one's body was higher among boys than among girls in most countries –in particular, in Estonia, Germany, Norway, Poland, the United Kingdom and South Korea. However, there is a series of countries where girls reported higher satisfaction with their bodies (although differences were not statistically significant). These countries are Colombia, Ethiopia and Nepal. These results suggest that gender differences would operate in opposite directions when comparing richer and poorer societies, which might indicate that some aspects of development (perhaps, access to technologies) could determine these differences.

In the school context, further evidence can be found in the study by Casas and Gonzalez (2017) mentioned above. The authors found support for the 'two worlds' hypothesis in multiple countries, with substantial gender differences as noted above. However, the fact that these results provide strong support for the 'two worlds' hypothesis in some countries but not in others suggests that the contribution of school-related factors (and/or school sub-domains) to the shaping of satisfaction with school and overall LS would differ across different socio-cultural contexts –and, potentially, by gender. Similarly, in the United Kingdom, The Good Childhood Report 2022 (The Children's Society, 2022) showed that in adolescence (age 11–18), compared to boys, girls were more dissatisfied in all 8 school domains examined (Listened to; Things you are learning in lessons; Schoolwork; Relationships with your teachers; Facilities; Relationships with other young people; Safety). This contradicts findings from Chen et al.'s (2020) meta-analysis, suggesting that what may be observed in one country (or most countries) may not be observed in others.

The Current Study

In sum, the literature suggests that nuanced approaches to assessing adolescent LS may help produce valuable evidence that can inform decisions on how to best support the LS of different groups of adolescents in different countries. We know that adolescent LS is influenced by a range of factors in multiple life domains, and boys and girls tend to have different experiences in these life domains (including school). Importantly, there is some empirical evidence and theoretical support suggesting that gender differences in how school affects adolescent LS may vary across different socio-cultural contexts, although this is yet to be examined in detail. The present study addresses this gap in knowledge by analysing data on 15-year-old students in 33 countries to explore the association between schools, factors in the school context, gender and student overall LS. The following research questions are examined:

1. Are there gender differences in students' overall LS and how does this vary across countries?
2. Are gender differences in overall LS associated with students' experiences at school and how does this vary across countries?
 1. Are there gender differences in the prevalence of school-related factors (schoolwork anxiety, bullying, etc.)?
 2. Are there gender differences in how these factors are associated with overall LS?

3. How are these factors associated with the gender gap in overall LS?
3. Do gender differences in overall LS differ across schools and how does this vary across countries?

It is hypothesised that –in line with the previous research- there will be gender differences in overall LS –with boys reporting higher overall LS than girls- and these will vary across countries. Research questions 2, 3 and 4 are more exploratory as these have not been directly studied before. The study of these questions will shed light on the importance of schools and school experiences when it comes to understanding gender differences in overall LS, and how this may vary across different socio-cultural settings.

Method

PISA 2015

Data from PISA 2015 (OECD, 2017a) was analysed. This is a study conducted every 3 years by the Organisation for Economic Co-operation and Development (OECD) in a large number of countries and economies. PISA collects data from 15-year-old students as well as from parents, teachers and school principals on a large number of issues affecting the lives of participating students. Although PISA's main focus is academic performance, it also includes information on students' socioeconomic status, educational background, and a great variety of data on education policies and practices. In its 2015 edition, PISA incorporated a new well-being domain which, for the first time, included a question on students' overall LS.

Out of 47 countries with available data on students' overall LS, only 33 countries were finally considered in this analysis. The reason for excluding some countries is the high proportion of missing data –above 20%- in variables of interest. The countries included are Austria, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Finland, France, Greece, Hong Kong, Hungary, Ireland, Iceland, Luxembourg, Latvia, Mexico, Peru, Poland, Portugal, Qatar, Russia, Slovakia, Slovenia, South Korea, Spain, Switzerland, Taiwan, Thailand, Turkey, the UAE, and the United States. In the case of China, only the regions and cities of Beijing, Shanghai, Jiangsu and Guangdong (B-S-J-G from now on) participated in PISA 2015. The sample size in each country is reported in Table A.1.1. in the electronic-supplementary-material. More detailed information about the sample and more technical issues can be found in PISA's technical report (OECD, 2017b).

Variables

Overall LS –a single-item scale from 0 (not at all satisfied) to 10 (completely satisfied)- is the only outcome variable in this study. This was the only subjective well-being variable available in PISA 2015. Overall LS is the most common subjective well-being indicator used in research on children and adolescents (Proctor et al., 2009) as well as to study group differences, including gender differences (Chen et al., 2020). LS is known to be more stable over time than the affective measures of subjective well-being (Eid & Diener, 2004). Single-item scales of overall LS such as Cantril's ladder (Cantril, 1965) and similar adaptations, have been validated in research on children (Levin & Currie, 2014).

Together with the gender binary variable, a large number of other predictors was originally considered but the list of variables finally considered in the multilevel regression models used in this study was reduced to 39 –which are enumerated in the electronic-supplementary-material. The selection of these variables was based on previous research and theoretical considerations (Casas & Gonzalez, 2017; OECD, 2017a; Rees & Main, 2015). Among these, as indicated below in Sect. "[Gender Differences in the Prevalence of School-related Factors which are Important to Students' Overall Life Satisfaction](#)", only those variables that improved the model fit were retained in the regression models, making sure that only those relevant to studying variation in students' overall LS were studied. The rationale for considering these variables -and no others- was also driven by data availability limitations, as data on some important factors were not available in PISA -or were available but levels of missing data were too high. Finally, only 12 were selected to study gender differences. This decision was made on the basis that these are 12 school-related factors that relate to aspects of students' lives where boys and girls may have different experiences (Casas & Gonzalez, 2017; OECD, 2017a; Rees & Main, 2015).

Analysis

The first part of the analysis explores how overall LS differs for girls and boys (research question 1, Sect. "[Gender Differences in Students' Overall Life Satisfaction](#)") in view of mean differences in overall LS between girls and boys and the direct effect of the variable gender (girls = 1, boys = 0) in multilevel regression controlling for relevant correlates of LS (see the model building approach detailed below). The second part of the analysis explores, first, mean differences between girls and boys in 12 school-related factors (research question 2.1, Sect. "[Association Between School-related Factors and the Gender Gap in Students' Overall Life Satisfaction](#)"). Second, direct and interaction effects in multilevel regression models explore gender differences in the association between these factors and overall LS (research question 2.2, Sect. 3.3). And third, a Blinder-Oaxaca decomposition analysis (Blinder, 1973; Oaxaca, 1973). This methodology can be applied to split the group differences in outcomes (overall LS) into a portion 'explained by' (associated with) group characteristics (the endowment effect) and a residual component. This is carried out to assess how each of these factors is associated with the gender gap in students' overall LS (research question 2.3, Sect. [Gender Differences in the Association Between School-related Factors and Students' Overall Life Satisfaction](#)). The third part of the analysis studies gender random effects in multilevel regression to assess whether the gender gap in students' overall LS varies across schools (research question 3, Sect. [Variation of Gender Differences in Students' Life Satisfaction Across Schools](#)). The results of the analysis are described in Sect. "[Results](#)" and discussed in Sect. "[Discussion](#)".

The multilevel regression analysis was conducted in the following way. For each country, a 2-level multilevel model was estimated (with students at level 1 and schools at level 2), which considered all the 39 variables enumerated in the electronic-supplementary-material. The process of building these models was inspired by the guidance provided by Hox (2010) and it involved a top-down strategy to define the fixed part of the model where non-statistically-significant variables (except essential control variables: gender and socioeconomic status) were not retained, which was assessed using Wald tests. Then, gender was added to the random part of the model to study gender random effects. Finally, the study of interaction effects involving gender and 12 school-related factors involved the creation

of 12 additional models for each country. All these multilevel models were estimated using maximum likelihood (Hox, 2010, p. 55).

Furthermore, final student weights were applied when estimating mean differences and when performing the Blinder-Oaxaca analyses. For multilevel regression, weights were applied at school and student levels, and the scale method presented by Rabe-Hesketh and Skrondal (2006) was used to scale final student weights -see Laukaityte and Wiberg (2018) for a detailed discussion on why this is needed. To deal with missing data, as indicated in Sect. "PISA 2015", countries where the proportion of missing data in variables of interest was high (i.e. above 20%) were excluded. Listwise deletion was used for the countries included in the analysis, which is common practice in multilevel analyses of PISA data (Da Silva & Matos, 2017; Schirripa et al., 2018; Tsai et al., 2018; van Hek et al., 2018).

Results

Gender Differences in Students' Overall Life Satisfaction

Table 1 shows that students' overall LS differs by gender. Detailed results disaggregated by gender and country are reported in Table A.1.2 in the electronic-supplementary-material. Results in Table 1 show that, on average, students reported the lowest overall LS in Eastern Asian societies and Turkey. Girls reported lower overall LS than boys in all countries -although gender differences are not statistically significant in a few of them and there is great cross-country variation overall. After controlling for -mainly- school-relevant correlates of LS, most gender gaps tend to reduce, although there is great variation in this reduction, and Hon-Kong emerges as a clear exception to this cross-national trend.

Gender Differences in the Prevalence of School-related Factors which are Important to Students' Overall Life Satisfaction

Table 2 summarises the results of the gender gap (mean differences) in 12 school-related factors. A detailed explanation of how to interpret this table is provided in the notes below Table 2. Results by country are reported in tables A.1.3 and A.1.4 in the electronic-supplementary-material. For example, Table A.1.3 in the electronic-supplementary-material shows that on average in Bulgaria, girls reported 0.4 standard deviations higher school-work-related anxiety than boys.

A summary of cross-national patterns for variables considered is reported in Table 2, which indicates the number of countries where statistically significant gender differences were observed and the average effect size. For example, boys reported a higher frequency of being bullied than girls in 29 countries, and the average gender gap in these countries was -0.20 standard deviations. Similarly, in 28 countries, boys scored higher in having repeated a grade and the average gender gap in these countries is -4.94% -this is, on average in these countries, the percentage of boys who had repeated a grade at least once was 4.94% higher than the percentage of girls who had repeated a grade at least once.

Table 2 shows that, for most of the factors studied, results are consistent across countries. For example, truancy is higher among boys than among girls in all the countries where gender differences are statistically significant. For others (e.g. sense of belonging at schools), results seem consistent with a few exceptions. And for others, there is no clear pattern at all (e.g. ability grouping practices).

Table 1 Gender differences in students' overall life satisfaction

	Mean LS	Gender differences in mean levels of LS	Effect of gender (Boy = 0, Girl = 1) in LS in a multilevel regression model controlling for relevant correlates of LS
Iceland	7.80	−0.93	−0.55
Slovenia	7.17	−0.91	−0.31
Austria	7.52	−0.86	−0.65
Luxembourg	7.38	−0.78	−0.76
Finland	7.89	−0.74	−0.63
Hungary	7.17	−0.74	−0.36
Poland	7.18	−0.69	−0.62
Switzerland	7.72	−0.65	−0.58
Czech Republic	7.05	−0.65	−0.50
Greece	6.91	−0.64	−0.54
United States	7.36	−0.60	−0.26
Croatia	7.90	−0.60	−0.55
Slovakia	7.47	−0.59	−0.80
Turkey	6.12	−0.59	−0.52
Ireland	7.30	−0.56	−0.32
Portugal	7.36	−0.51	−0.37
South Korea	6.36	−0.47	−0.19
Chile	7.37	−0.47	−0.36
Estonia	7.50	−0.46	−0.31
France	7.63	−0.45	−0.16
Bulgaria	7.42	−0.42	−0.24
Colombia	7.88	−0.37	−0.39
Spain	7.42	−0.37	−0.34
Russia	7.76	−0.32	−0.25
Taiwan	6.59	−0.29	−0.31
UAE	7.30	−0.27	−0.19
Qatar	7.41	−0.21	−0.18
Latvia	7.37	−0.16	−0.17
Peru	7.50	−0.15	−0.13
Mexico	8.27	−0.12	−0.12
China (B-S-J-G)	6.83	−0.10	−0.16
Hong-Kong	6.48	−0.07	−0.31
Thailand	7.71	−0.04	−0.12

Countries are ordered from greater to smaller gender differences in mean levels of LS. Negative values indicate that boys reported higher LS than girls -statistically significant differences ($p < 0.05$) are highlighted in bold

In particular, girls tended to report higher levels of schoolwork-related anxiety, sense of belonging at school, feeling emotionally supported by parents, and academic competence, and lower levels of frequency of being bullied, feeling unfairly treated by teachers, Information and Communication Technology (ICT) use at home for schoolwork, valuing cooperation and teamwork, truancy and having repeated a grade.

Table 2 Summary of the gender gap (Mean differences) in school-related factors

School-related factor	NA	Girls score higher than boys		Boys score higher than girls	
		N (+)	MES	N (-)	MES
Index of schoolwork-related anxiety	33	33	0.39		
Index of sense of belonging at school	33	19	0.10	4	-0.13
Index of frequency of being bullied	33			29	-0.20
Index of feeling unfairly treated by teachers	33			33	-0.28
Index of feeling emotionally supported by parents	33	18	0.10	1	-0.08
Index of academic competence	33	16	0.18	1	-0.09
Index of ICT use at home for schoolwork	29			24	-0.17
Index of valuing cooperation and teamwork	33	1	0.05	23	-0.11
Index of truancy	33			27	-0.19
Having repeated a grade	33			28	-4.94%
School practices ability grouping within classes	33	4	3.82%	2	-4.47%
School practices ability grouping between classes	33	3	4.84%	2	-8.38%

NA indicates the number of countries with available data. N indicates the number of countries where a statistically significant difference (either positive (+) or negative (-)) was found ($p < 0.05$). MES indicates the average mean difference (in standard deviations for indices and in % of students for the other variables) in the countries where statistically significant differences were found. Detailed results by country are reported in Tables A.1.3 and A.1.4 in the electronic-supplementary-material

Some exceptions to the general patterns observed across countries provide some interesting insights for some countries. For example, compared to boys, girls reported higher levels of academic competence and feeling emotionally supported by parents in relation to school in 16 and 18 countries, respectively, and lower levels than boys in 1 country only (Chile in both cases). Likewise, in 23 countries, levels of valuing cooperation and teamwork were higher among boys but in 1 country (Qatar) levels were higher among girls.

Gender Differences in the Association Between School-related Factors and Students' Overall Life Satisfaction

Table 3 summarises gender differences in the association between the 12 school-related factors studied in the previous section and overall LS. Results by country are shown in the electronic-supplementary-material in tables A.1.4 to A.1.16. For example, Table A.1.5 in the electronic-supplementary-material shows that, in Chile, an increase of 1 standard deviation in the index of schoolwork-related anxiety was associated with a decrease in overall LS of -0.48 points among girls and -0.23 among boys. The interaction effect of 0.24 points indicates the gender gap for this association.

Table 3 summarises cross-national patterns for each of the factors considered. Three elements are examined: the number of countries in which there was a direct association (for all, for boys and for girls), the average effect size for each category, and the number of countries with gender differences in the effect size (i.e. statistically significant interaction effect). Details on how to interpret the direction of the interaction effects are provided in the note in Table 3. Overall, for most of the factors studied, results are consistent across countries for the three elements studied. For example, bullying was associated with girls'

Table 3 Summary of gender differences in the effect that school-related factors have on students' overall life satisfaction

School-related factor	NA		Direct effect				Interaction (Gender gap)						
	All students		Girls		Boys		Girls		Boys				
	N (+)	MES	N (-)	MES	N (+)	MES	N (-)	MES	N (+)	MES	N (-)	MES	
Index of schoolwork-related anxiety	33		33	-0.34	9	-0.39	32	-0.30	7	0.17	32	-0.30	11
Index of sense of belonging at school	33	0.13											1
Index of frequency of being bullied	33		32	-0.26		-0.31					31	-0.24	8
Index of feeling unfairly treated by teachers	33		25	-0.18		-0.24					22	-0.18	9
Index of feeling emotionally supported by parents	33	0.53			33	0.57			33	0.48			11
Index of academic competence	33	0.12	21	-0.18		-0.23					18	-0.20	10
Index of ICT use at home for schoolwork	29	0.14			7	0.21			11	0.14	1	-0.14	2
Index of valuing cooperation and teamwork	33	0.19			26	0.19			28	0.22			4
Index of truancy	33		19	-0.13		-0.19					10	-0.18	9
Having repeated a grade	33*		2	-0.31					2	0.23	4	-0.13	1
School practices ability grouping within classes	33	0.19			2	0.32			2	0.20	2	-0.49	3
School practices ability grouping between classes	33		1	-0.16					1	0.21	1	-0.27	1

NA indicates the number of countries with available data. *For having repeated a grade, there was available data to study direct effects among all students in 33 countries, among girls in 31 countries, among boys in 29 countries, and interaction effects in 29 countries. This is because, in a few countries, the sample size for these groups (girls or boys who have repeated a grade) contains less than 30 observations. Direct effects are reported considering the entire population, considering boys only, and considering girls only. N indicates the number of countries where a statistically significant effect (either positive (+) or negative (-)) was found. MES indicates the average effect size in the countries where a statistically significant effect was observed. Interactions indicate the gender gap in the effect of the school-related factor on students' LS. When the direct effect on students' overall LS is negative (e.g. in 19 countries, truancy), a negative interaction indicates that the effect is greater among girls (for truancy, this was observed in 9 countries) and a positive interaction indicates that the effect is greater among boys (for truancy, this was observed in 1 country). When the direct effect on students' overall LS is positive (e.g. in 12 countries, ICT use at home for schoolwork), a negative interaction indicates that the effect is greater among boys (for ICT use at home for schoolwork, this was observed in 2 countries) and a positive interaction indicates that the effect is greater among girls (for ICT use at home for schoolwork, this was observed in 1 country). Detailed results by country are reported in tables A.1.5 to A.1.16 in the electronic-supplementary-material

overall LS in 30 countries and boy's overall LS in 31 countries, and the average effect size was larger among girls than among boys in 8 countries –while the opposite is observed in none. However, for others (e.g. valuing cooperation and teamwork), cross-country patterns are less evident.

Specifically, the association between most self-reported well-being factors (schoolwork-related anxiety, frequency of being bullied, feeling unfairly treated by teachers and feeling emotionally supported by parents) and overall LS tends to be stronger among girls. The only exception is sense of belonging at school, where gender differences seem small and direct and interaction effects were observed in fewer countries. For other factors, gender differences tend to be small or found in a smaller number of countries.

There are again some interesting exceptions to the general patterns observed across countries that are worth mentioning. Schoolwork-related anxiety was negatively associated with overall LS in all countries but France among girls, and in all countries but Colombia among boys. The negative association between academic competence and overall LS was stronger among boys in 10 countries and stronger among girls in 1 country, the UAE, where academic competence was 0.30 standard deviations greater among girls than among boys. The negative association between truancy was stronger among girls in 9 countries and stronger among boys in 1 country, South Korea, where the effect was negative and statistically significant among boys (-0.30^{***} points) and positive but very small and not statistically significant among girls (0.00 points). Finally, attending a school that practices ability grouping was rarely associated with gender differences in overall LS. However, in France, attending a school that practices ability grouping within classes was positively associated with students' overall LS among girls (0.41^{**} points) and negatively associated among boys (-0.51^{**} points). In no other country, a statistically significant effect was observed for both gender groups for this variable.

Association Between School-related Factors and the Gender Gap in Students' Overall Life Satisfaction

Table 4 shows the results of a Blinder-Oaxaca decomposition analysis of the gender gap in students' overall LS in view of the 12 school-related factors studied in the previous two sections. This analysis illustrates whether -and to what extent- a factor is positively associated with the gender gap in overall LS (this is, benefits boys over girls, potentially helping increase the gap) or a negative one (benefits girls over boys, potentially helping reduce the gender gap). Detailed results by country are shown in tables A.1.17 to A.1.28 in the electronic-supplementary-material. The size of the effects in Table 4 is expressed in terms of the % of the gender gap in overall LS. For example, Table A.1.19 in the electronic-supplementary-material shows that, in Austria, bullying was negatively associated with the gender gap and the estimate of -0.13 points is equivalent to -15.42% of the gender gap in overall LS in this country (endowments share). This is, bullying is a factor that would help reduce the gender gap in LS as this is a factor that was negatively associated with overall LS and which seems to affect boys more than girls. However, acting in the opposite direction there are other unobserved factors (unexplained share) which altogether would have a much stronger effect -this is 0.94 points, which in size is greater than the observed gender gap in LS (108.89%)- and, consequently, the gender gap in favour of boys over girls remains great despite the effect of bullying (see more details on how to interpret the results in notes below Table 4).

Table 4 Summary of the Blinder-Oaxaca decomposition analysis of the gender gap in students' overall life satisfaction in view of 12 school-related factors

School-related factor	NA		Endowment Effect				Unexplained Effect				Interaction			
	N	MES (%)	N (+)	MES (%)	N (-)	MES (%)	N (+)	MES (%)	N (-)	MES (%)	N (+)	MES (%)	N (-)	MES (%)
Index of schoolwork-related anxiety	33	32	39.92			76.10	28				4	6.02	15	-15.26
Index of sense of belonging at school	33	4	8.59	-7.10	13	101.06	30							
Index of frequency of being bullied	33			-32.98	28	117.45	32				11	21.65		
Index of feeling unfairly treated by teachers	33			-34.66	33	124.09	32				21	12.38		
Index of feeling emotionally supported by parents	33	2	4.49	-7.52	17	105.78	28				15	1.08		
Index of academic competence	33	2	11.73	-8.45	7	100.71	30				4	7.01	2	-12.17
Index of ICT use at home for schoolwork	29	9	10.85			96.30	26						1	-23.49
Index of valuing cooperation and teamwork	33	22	8.70			93.47	30				1	2.17		
Index of truancy	33			-12.85	27	106.03	31				10	7.93		
Having repeated a grade	33			-8.04	15	102.78	30				3	6.14		
School practices ability grouping within classes	33					100.10	30							
School practices ability grouping between classes	33					99.85	29							

The endowment effect indicates the proportion of the gender gap in LS that is associated with the school-related factor considered. The unexplained effect indicates the proportion of the gender gap in LS that is not associated with the school-related factor considered but by other factors. The interaction refers to the interaction between the endowment and the unexplained effects. NA indicates the number of countries with available data. N indicates the number of countries where a statistically significant association (either positive (+) or negative (-)) was found. MES (%) indicates the average effect size in the countries where a statistically significant association was found, which is expressed as a % of the gender gap in LS. When the association between the school-related factor and overall LS is positive (e.g. in 16 countries, sense of belonging at school; see Table 3), positive endowment values indicate that the school-related factor would benefit boys over girls (i.e. potentially helping increase the gender gap in LS; for sense of belonging at school this was observed in 4 countries) while negative values indicate the opposite effect (for sense of belonging at school this was observed in 13 countries). When the association between the school-related factor and overall LS is negative (e.g. in 21 countries, academic competence; see Table 3), positive endowment values indicate that the school-related factor would benefit girls over boys (i.e. potentially helping reduce the gender gap in LS; for academic competence this was observed in 2 countries) while negative values indicate the opposite effect (for academic competence this was observed in 7 countries). Effects of more than 100% may exist because forces acting in opposite directions coexist. For example, when considering a gender gap of 0.5 points (i.e. on average, boys reported higher LS than girls), the factor considered might be acting in the opposite direction (i.e. potentially helping reduce the gender gap by -0.1 points -the equivalent to -20% of the gap) that the other factors considered altogether (which would potentially help increase the gap by 0.6 points -the equivalent to 120% of the gap), thus resulting in this estimate of 0.5 points. Detailed results by country are shown in tables A.1.17 to A.1.28 in the electronic-supplementary-material

Results are summarised for all countries in Table 4 in a similar way as Table 2 and Table 3. Again, there is consistency across multiple countries for some factors, (e.g. feeling emotionally supported by parents), but for other factors associations with the gender gap in overall LS was observed only in a few countries –or in no country.

In particular, the most prominent factors negatively associated with the gender gap in overall LS (i.e. gender differences in these factors would benefit girls over boys) are feeling unfairly treated by teachers (an effect size that—on average across 33 countries- was equivalent to – 34.66% of the gender gap in overall LS) and the frequency of being bullied (– 32.98% on average across 28 countries). Another factor negatively associated with the gender gap in overall LS observed in most countries (27) is truancy –although the estimate is smaller in size (– 12.85% on average). In about half of the countries, having repeated a grade and feeling emotionally supported by parents in relation to school were negatively associated with the gender gap in students’ overall LS, although the estimates were smaller in these cases (on average, – 8.04% and – 7.52%, respectively). In the latter case, however, a positive association was observed in two countries (Chile and the UAE). The most prominent factor positively associated with the gender gap in overall LS (i.e. gender differences in these factors would benefit boys over girls) is schoolwork-related anxiety (39.92% on average across 32 countries). Another factor positively associated with the gender gap in overall LS observed in a large number of countries (22) is valuing cooperation and teamwork, although the effects were smaller size (8.70% on average). ICT use at home for school work was positively associated with gender differences in overall LS in 9 countries (10.85% on average). For the remaining school-related factors, patterns are less clear.

Variation of Gender Differences in Students’ Life Satisfaction Across Schools

Finally, Table 5 shows the results of the study of gender random effects. The existence of statistically significant random effects for gender indicates that the gender gap in students’ overall LS differed across schools. There is evidence of random effects in 11 of the 33 countries studied. This is in several European countries – Bulgaria, the Czech Republic, Finland, France, Hungary, Poland, Slovakia and Switzerland- as well as in China (B-S-J-G), Peru and Turkey. The latter three are the countries where random effects are the greatest.

Discussion

The analysis presented in the previous section provides evidence to answer the three research questions explored in this study. As to the first research question, in line with previous research (see Chen et al.’s (2020) meta-analysis), results in Sect. "Gender Differences in Students’ Overall Life Satisfaction" showed that overall LS was lower among girls than among boys on average in all the countries studied. This difference was especially great in some countries. Compared to European countries, the gender gap in overall LS was smaller in most Asian societies as well as in Mexico and Peru. Furthermore, in most countries, the size of the gender gap in overall LS differed significantly depending on whether control variables were considered (direct gender effect in multilevel regression models) or not (‘raw’ mean differences), suggesting that these are important factors explaining gender differences in students’ overall LS. Since most of these variables are school-related factors, these results present some preliminary evidence regarding the second research question.

Table 5 Gender random effects on students' overall life satisfaction

Country	Coefficient	S.E	(95% Confidence interval)
Austria	0.21	0.14	(0.06–0.77)
Bulgaria	0.21	0.06	(0.03–1.40)
Chile	0.00	0.00	(0.00–0.00)
China (B-S-J-G)	0.39	0.12	(0.22–0.70)
Colombia	0.00	0.00	(0.00–0.00)
Croatia	0.00	0.00	(0.00–0.00)
Czech Republic	0.31	–0.09	(0.18–0.55)
Estonia	0.16	–0.11	(0.04–0.62)
Finland	0.24	–0.06	(0.15–0.39)
France	0.33	–0.15	(0.13–0.81)
Greece	0.17	0.13	(0.04–0.78)
Hong Kong	0.08	0.26	(0.00–0.00)
Hungary	0.29	0.12	(0.13–0.65)
Iceland	0.22	0.14	(0.06–0.75)
Ireland	0.00	0.00	(0.00–0.00)
Latvia	0.00	0.00	(0.00–0.00)
Luxembourg	0.14	–0.17	(0.01–1.64)
Mexico	0.22	0.15	(0.06–0.84)
Peru	0.42	–0.2	(0.17–1.05)
Poland	0.23	–0.11	(0.09–0.57)
Portugal	0.00	0.00	(0.00–0.00)
Qatar	0.00	0.00	(0.00–0.00)
Russia	0.18	–0.47	(0.00–33.67)
Slovakia	0.33	–0.11	(0.17–0.64)
Slovenia	0.23	–0.14	(0.07–0.78)
South Korea	0.00	0.00	(0.00–0.00)
Spain	0.00	0.00	(0.00–0.00)
Switzerland	0.34	–0.08	(0.22–0.54)
Taiwan	0.00	0.00	(0.00–0.00)
Thailand	0.23	–0.16	(0.06–0.88)
Turkey	0.49	–0.12	(0.30–0.79)
UAE	0.11	0.27	(0.00–12.49)
United States	0.00	0.00	(0.00–0.00)

Statistically significant effects are highlighted in bold

To study the second research question, the three related sub-questions were examined in Sects. "Association Between School-related Factors and the Gender Gap in Students' Overall Life Satisfaction", respectively. The focus was on gender differences in 12 school-related factors, how these factors relate to overall LS among boys and girls, and how these differences in students' experiences at school are associated with the gender gap in overall LS. The results show gender differences in students' experiences at school and how these relate to overall LS. As to specific cross-national patterns, results show that, in the school context, boys tend to have more negative experiences than girls in factors linked

to their overall LS –at least regarding the factors investigated in this study. Among those factors more strongly associated with the gender gap in overall LS in most countries, boys tend to have more negative experiences than girls in the area of relationships (bullying and relationships with teachers), which is consistent with findings from previous research (Casas & Gonzalez, 2017; Rees & Main, 2015). By contrast, schoolwork-related anxiety is an aspect of students' lives in which girls tend to have much more negative experiences than boys. School anxiety has traditionally been overlooked in the field of child subjective well-being. Research studying the links between school/test anxiety and adolescents' LS is scarce, although a few studies have investigated this question recently. In Germany, Steinmayr et al., (2016, 2018) found that test anxiety negatively predicts variations in LS. The present study makes an important contribution to the field by showing that this is an important global problem in education affecting girls especially.

The finding that, compared to boys, girls may have more positive experiences in some school domains and worse in others aligns with the 'two worlds' study by Casas and Gonzalez (2017) described in Sect. "[Assessing Cross-National Variation in Adolescent Subjective Well-being](#)" in section. Casas and Gonzalez (2017) argue that girls and boys would differ in their experiences in different school domains and how these might affect their satisfaction with school and their overall LS. Despite the differences between the present study and Casas and Gonzalez (2017) –mainly concerning how school domains/factors are assessed- both highlight the need for more nuanced approaches to study how adolescents' experiences in different school domains relate to overall LS and other subjective well-being measures in different ways for boys and girls.

The third research question examined in Sect. "[Variation of Gender Differences in Students' Life Satisfaction Across Schools](#)" in section was more concerned with whether attending one school or another can make a difference regarding gender differences in overall LS. The analysis revealed that, although in most nations the gender gap in students' overall LS does not differ across schools, in 11 out of 33 countries there is evidence of gender random effects –meaning that, across schools, girls and boys may find rather different environments in terms of school-related factors associated with gender differences in overall LS. This suggests that not only policymaking at the education system level could play a role in shaping students' LS in different ways for girls and boys but also policy and practice at the school level. Future research should further explore why this is observed in some countries but not in others.

Overall, the main contribution that the present study makes to the literature is the assessment of cross-national variation in how school may affect adolescent LS in different ways for girls and boys. Although the present study revealed some cross-national patterns (described above), findings were less consistent across countries for some of the school factors studied. Also, in some countries, results operated in the opposite direction compared to the cross-national patterns identified (e.g. Chile on academic competence and parental support (Sect. "[Association Between School-related Factors and the Gender Gap in Students' Overall Life Satisfaction](#)"); Qatar on valuing cooperation and teamwork (Sect. "[Association Between School-related Factors and the Gender Gap in Students' Overall Life Satisfaction](#)"); ability grouping practices in France (Sect. [Gender Differences in the Association Between School-related Factors and Students' Overall Life Satisfaction](#)), etc.). Discussing all of them in detail is beyond the scope of what is feasible in this manuscript, but the example of bullying in South Korea helps illustrate this. Comparative research shows that children in this country tend to report by far the lowest level of bullying and this is also the country –or one of the countries- where the gender gap is the greatest, with girls reporting much lower levels of bullying (OECD, 2017a; Rees & Main, 2015). At the

same time, Table A.1.7. in the electronic-supplementary-material shows that, among the 33 countries studied, South Korea is the only one in which the frequency of being bullied is not associated with students' overall LS. However, these results seem to hide important gender differences as there is an association for girls (a statistically significant negative effect of -0.28^{***} points) but not for boys (a non-statistically significant negative effect of -0.01). This highlights, again, the importance of adopting more nuanced approaches in the field of adolescent LS that account for differences across nations and socio-demographic groups.

The association between school, gender and adolescent LS is complex and more research is needed to disentangle these complexities. However, research has already provided some valuable evidence that can help inform policy and practice responses intended to support student LS in the school context. These are discussed next.

Lessons for Policy and Practice

First, the overall LS of girls and boys may be influenced by multiple factors in the school context that are amenable to policy interventions to different degrees (e.g. schoolwork-related anxiety, bullying, relationships with teachers, parents' emotional support in relation to school, etc.). Decision-makers and relevant stakeholders should look beyond academic outcomes and develop policy and practice responses intended to improve children's experiences in these aspects of their lives. For example, cognitive-behavioural interventions have been proven to be effective to reduce test anxiety (Putwain et al., 2021; Yeo et al., 2016). Similarly, multiple studies have reported successful interventions to reduce school bullying (Gaffney et al., 2019) and increase parental involvement in school (Mayer et al., 2019; Smith & Sheridan, 2019).

Importantly, these responses should be sensitive to differences by gender and across countries. For example, this study found that feeling emotionally supported by parents in relation to school is of paramount importance to students' overall LS in all countries, and Chile is the only country where girls reported lower levels of parents' emotional support than boys. This would imply that contrary to most countries, in Chile, policy interventions should prioritize girls rather than boys. The importance of adopting country-specific interventions has been highlighted by different studies. For example, in a meta-analysis of interventions intended to reduce bullying in schools, Gaffney et al. (2019) show that some interventions may be more effective in some countries and world regions than in others.

Finally, not only do policymakers at the education system level have an important role to play but also decision-makers at the school level –this is mainly teachers, school principals and other school staff. Research shows that, in many countries, attending one school or another matters in terms of the factors associated with students' overall LS (Marquez & Main, 2020) and that this may vary for students of different socio-economic status (Marquez, 2021). The present study has shown that this may also differ for boys and girls in some countries. This would suggest that some schools already do better than others at providing a more positive environment to their students and, therefore, that there are changes in policy and practice that certain schools could perform to achieve this. Research evaluating the effectiveness of school-based interventions to promote positive mental health and emotional wellbeing have shown some promising results (O' Connor et al., 2018) and, therefore, it is essential that schools acknowledge the important role that they can play in promoting students' wellbeing and lead the way to provide a more positive school environment.

Limitations

There are some limitations affecting this study. First, due to data availability limitations, this study studies one outcome variable only (a single-item scale of overall LS from 0 to 10). Alternative LS measures may provide a more complete –and, perhaps, different– picture of this association. Second, LS data is negatively skewed –a common phenomenon in studies on LS– and this could have an impact on the validity of the results. In this study, this variable was particularly skewed in Mexico and Colombia, thus, findings involving these nations must be interpreted with caution. Third, a rather conservative approach to dealing with missing data was adopted (see Sect. "Gender Differences in the Prevalence of School-related Factors which are Important to Students' Overall Life Satisfaction"), yet levels of missing data in some of the analyses presented in this study are moderately high. Fourth, although solid evidence on the links between school, gender and overall LS are presented in this study, causal methods were not employed –thus, some of these results must be interpreted with caution. Fifth, the study focuses on a definition of adolescence that refers to a specific group (15-year-old adolescents who are enrolled in mainstream education, mainly in high-income countries). In view of the discussion on the role of age presented in Sect. "Gender Differences in School Influences on Adolescent Subjective Well-being" and findings on cross-national variation, different results might be obtained if studying this question in other stages of adolescence and other countries. Sixth, in view of the large sample size (see Table A.1 in the electronic-supplementary-material), small effect sizes reported in this study should be interpreted with caution. Finally, due to data availability limitations, this study focused on a binary definition of gender, but future research should adopt more inclusive approaches to assessing gender that incorporate a focus on gender minorities, especially given that this is a highly vulnerable group in terms of adolescent wellbeing (Marquez et al., 2023).

Conclusions

This study explored cross-national variation in how schools and factors in the school context affect adolescents' overall LS in different ways for boys and girls. There are gender differences in the overall LS of 15-year-old students, with girls reporting lower overall LS in all countries. However, the association between school, gender and students' LS is a complex one. Factors in the school context are associated with the overall LS of students in different ways for girls and boys and, at the same time, this differs across countries and, in some countries, also across schools. Schools and education policy have the potential of promoting students' LS, particularly in the domains of school anxiety, bullying, relationships with teachers and parents' emotional support in relation to school. However, policy and practice responses that adopt a more nuanced approach to account for differences by gender as well as for geographic differences are more likely to be successful at making a positive impact on the lives of adolescents.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10566-023-09756-7>.

Funding This research was supported by the Economic and Social Research Council (ES/V012002/1).

Data Availability The data used in this study is publically available at <https://www.oecd.org/pisa/data/>.

Declarations

Conflict of interest The author declare that they have no conflict of interest.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Arnett, J. J. (2007). Emerging adulthood: What is it, and what is it good for? *Child Development Perspectives*, 1(2), 68–73. <https://doi.org/10.1111/j.1750-8606.2007.00016.x>
- Bang, H., Won, D., & Park, S. (2020). School engagement, self-esteem, and depression of adolescents: The role of sport participation and volunteering activity and gender differences. *Children and Youth Services Review*, 113, 105012. <https://doi.org/10.1016/j.childyouth.2020.105012>
- Blinder, A. (1973). Wage discrimination: Reduced form and structural estimates. *The Journal of Human Resources*, 8(4), 436–455. <https://doi.org/10.2307/144855>
- Bradshaw, J., & Rees, G. (2017). Exploring national variations in child subjective well-being. *Children and Youth Services Review*. Pergamon, 80, 3–14. <https://doi.org/10.1016/j.childyouth.2017.06.059>
- Cantril, H. (1965). *The pattern of human concerns*. Rutgers University Press.
- Casas, F., Bălăţescu, S., Bertran, I., González, M., & Hatos, A. (2013). School satisfaction among adolescents: Testing different indicators for its measurement and its relationship with overall life satisfaction and subjective well-being in Romania and Spain. *Social Indicators Research*, 111(3), 665–681. <https://doi.org/10.1007/s11205-012-0025-9>
- Casas, F., & González, M. (2017). School: One world or two worlds? *Children's Perspectives. Child. Youth Serv. Rev.*, 80, 157–170. <https://doi.org/10.1016/j.childyouth.2017.06.054>
- Casas, F., & González-Carrasco, M. (2019). Subjective well-being decreasing with age: New research on children over 8. *Child Development*, 90(2), 375–394. <https://doi.org/10.1111/cdev.13133>
- Casas, F., Sarriera, J., Alfaro, J., González, M., Figuer, C., Abs da Cruz, D., Bedin, L., Valdenegro, B., & Oyarzun, D. (2014). Satisfacción escolar y bienestar subjetivo en la adolescencia: Poniendo a prueba indicadores para su medición comparativa en Brasil. *Chile y España. Suma Psicológica*, 21(2), 70–80. [https://doi.org/10.1016/S0121-4381\(14\)70009-8](https://doi.org/10.1016/S0121-4381(14)70009-8)
- Cavioni, V., Grazzani, I., Ornaghi, V., Agliati, A., & Pepe, A. (2021). Adolescents' Mental Health at School: The Mediating Role of Life Satisfaction. *Frontiers in Psychology*, 12, 720628. <https://doi.org/10.3389/fpsyg.2021.720628>
- Chen, X., Cai, Z., He, J., & Fan, X. (2020). Gender differences in life satisfaction among children and adolescents: A meta-analysis. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 21(6), 2279–2307. <https://doi.org/10.1007/s10902-019-00169-9>
- Cox, T. (2000). 'Pupils' perspectives on their education. In T. Cox (Ed.), *Combating educational disadvantage Meeting the needs of vulnerable children*. Falmer Press.
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., & Rasmussen, V. B. (2012). *Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: international report from the 2009/2010 survey*. Health Policy for Children and Adolescents, 6. Copenhagen, Denmark: WHO Regional Office for Europe.
- Diener, E., Lucas, R., & Oishi, S. (2002). Subjective well-being: The science of happiness and life satisfaction. In C. R. Snyder & S. J. Lopez (Eds.), *The handbook of positive psychology* (pp. 63–73). Oxford University Press.
- Diener, E., Oishi, S., & Tay, L. (2018). Advances in subjective well-being research. *Nature Human Behaviour*, 2(4), 253–260. <https://doi.org/10.1038/s41562-018-0307-6>
- Dinisman, T., & Ben-Arieh, A. (2016). The characteristics of children's subjective well-being. *Social Indicators Research*, 126(2), 555–569. <https://doi.org/10.1007/s11205-015-0921-x>

- Eid, M., & Diener, E. (2004). Global judgments of subjective well-being: Situational variability and long-term stability. *Social Indicators Research*, 65(3), 245–277. <https://doi.org/10.1023/B:SOCI.0000003801.89195.bc>
- Gaffney, H., Farrington, D. P., & Ttofi, M. M. (2019). Examining the effectiveness of school-bullying intervention programs globally: A Meta-analysis. *International Journal of Bullying Prevention*, 1, 14–31. <https://doi.org/10.1007/s42380-019-0007-4>
- Galambos, N. L., Berenbaum, S. A., & McHale, S. M. (2009). Gender development in adolescence. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology Individual bases of adolescent development* (3rd ed., Vol. 1, pp. 305–357). Delhi: Wiley.
- Gonzalez-Carrasco, M., Casas, F., Malo, S., Vinas, F., & Dinisman, T. (2017). Changes in subjective well-being through the adolescent years: Differences by gender. *Journal of Happiness Studies*, 18(1), 63–88. <https://doi.org/10.1007/s10902-016-9717-1>
- Halpern, D. F. (1997). Sex differences in intelligence: Implications for education. *American Psychologist*, 52(10), 1091–1102. <https://doi.org/10.1037/0003-066X.52.10.109>
- Helliwell, J. F., Layard, R., & Sachs, J. (2015). World happiness report 2012. New York: UN Sustainable development solutions network. Available at: <http://worldhappiness.report/ed/2015/> (Accessed: 4 April 2023).
- Hox, J. J. (2010). *Multilevel analysis: Techniques and applications*. Routledge.
- Hughes, J. N., & Im, M. H. (2016). Teacher–student relationship and peer disliking and liking across Grades 1–4. *Child Development*, 87(2), 593–611. <https://doi.org/10.1111/cdev.12477>
- Kaye-Tzadok, A., Kim, S. S., & Main, G. (2017). Children’s subjective well-being in relation to gender—What can we learn from dissatisfied children? *Children and Youth Services Review*, 80, 96–104. <https://doi.org/10.1016/j.childyouth.2017.06.058>
- Kessels, U., Heyder, A., Latsch, M., & Hannover, B. (2014). How gender differences in academic engagement relate to students’ gender identity. *Educational Research*, 56(2), 220–229. <https://doi.org/10.1080/00131881.2014.898916>
- Kırkkaya, B. E. (2011). Grade 4 to 8 primary school students’ attitudes towards science: Science enthusiasm. *Educational Research and Reviews*, 6, 374–382.
- Klocke, A., Clair, A., & Bradshaw, J. (2013). International variation in child subjective well-being. *Child Indicators Research*, 7(1), 1–20.
- Laukaiyte, I., & Wiberg, M. (2018). Importance of sampling weights in multilevel modeling of international large-scale assessment data. *Communications in Statistics - Theory and Methods*, 47(20), 4991–5012.
- Lee, B. J., & Yoo, M. S. (2015). Family, school, and community correlates of children’s subjective well-being: An international comparative study. *Child Indicators Research*, 8(1), 151–175. <https://doi.org/10.1007/s12187-014-9285-z>
- Levin, K. A., & Currie, C. (2014). Reliability and validity of an adapted version of the Cantril Ladder for use with adolescent samples. *Social Indicators Research*, 119(2), 1047–1063. <https://doi.org/10.1007/s11205-013-0507-4>
- Liu, W., Mei, J., Tian, L., & Huebner, E. S. (2016). Age and gender differences in the relation between school-related social support and subjective well-being in school among students. *Social Indicators Research*, 125(3), 1065–1083. <https://doi.org/10.1007/s11205-015-0873-1>
- Marquez, J., Katsantonis, I., Sellers, R., & Knies, G. (2022). Life satisfaction and mental health from age 17 to 21 years in a general population sample. *Current psychology (New Brunswick, N.J.)*, 1–11. Advance online publication. <https://doi.org/10.1007/s12144-022-03685-9>
- Marquez, J., Humphrey, N., Black, L., Cutts, M., & Khanna, D. (2023). Gender identity and sexual orientation inequalities in adolescent wellbeing: Findings from the #BeeWell study. Retrieved April 7, 2023, from <https://osf.io/preprints/socarxiv/75xvd/>
- Marquez, J. (2021). Does school impact adolescents’ life satisfaction differently for students of different socio-economic status? A comparative study in 33 countries. *Education Inquiry*. <https://doi.org/10.1080/20004508.2021.1930345>
- Marquez, J., & Long, E. (2020). A global decline in adolescents’ subjective well-being: A comparative study exploring patterns of change in the life satisfaction of 15-year-old students in 46 countries’. *Child Indicators Research*. <https://doi.org/10.1007/s12187-020-09788-8>
- Marquez, J., & Main, G. (2020). Can schools and education policy make children happier? A comparative study in 33 countries. *Child Indicators Research*. <https://doi.org/10.1007/s12187-020-09758-0>
- Martino, M. (1999). ‘Cool boys’, ‘party animals’, ‘squids’ and ‘poofters’: Interrogating the dynamics and politics of adolescent boys at school. *British Journal of Sociology of Education*, 20(2), 239–263. <https://doi.org/10.1080/01425699995434>

- Mayer, S. E., Kalil, A., Oreopoulos, P., & Gallegos, S. (2019). Using behavioral insights to increase parental engagement the parents and children together intervention. *Journal of Human Resources*, *54*(4), 900–925.
- McCoy, S., & Banks, J. (2012). Simply academic? Why children with special educational needs don't like school. *European Journal of Special Needs Education*, *27*(1), 81–97. <https://doi.org/10.1080/08856257.2011.640487>
- McManus, S., Gunnell, D., Cooper, C., Bebbington, P. E., Howard, L. M., Brugha, T., Jenkins, R., Hassiotis, A., Weich, S., & Appleby, L. (2019). Prevalence of non-suicidal self-harm and service contact in England, 2000–14: Repeated cross-sectional surveys of the general population. *The Lancet Psychiatry*, *6*(7), 573–581. [https://doi.org/10.1016/S2215-0366\(19\)30188-9](https://doi.org/10.1016/S2215-0366(19)30188-9)
- Millard, E. (1997). Differently literate: Gender identity in the construction of the developing reader. *Gender and Education*, *9*(1), 31–48. <https://doi.org/10.1080/09540259721439>
- Mojtabai, R., Olfson, M., & Han, B. (2016). National trends in the prevalence and treatment of depression in adolescents and young adults. *Pediatrics*, *138*(6), e20161878. <https://doi.org/10.1542/peds.2016-1878>
- Oaxaca, R. (1973). Male–Female wage differentials in urban labor markets. *International Economic Review*, *14*(3), 693–709. <https://doi.org/10.2307/2525981>
- O'Connor, C. A., Dyson, J., Cowdell, F., & Watson, R. (2018). Do universal school-based mental health promotion programmes improve the mental health and emotional wellbeing of young people? A literature review. *Journal of Clinical Nursing*, *27*(3–4), e412–e426. <https://doi.org/10.1111/jocn.14078>
- OECD (2017a). *PISA 2015 results (Volume III): Students' Well-Being*. PISA, OECD Publishing, Paris, Retrieved April 7, 2023, from <https://doi.org/10.1787/9789264273856-en>
- OECD (2017b). *PISA 2015 Technical Report*. PISA, OECD Publishing, Paris, Retrieved April 7, 2023, from <http://www.oecd.org/pisa/sitedocument/PISA-2015-technical-report-final.pdf>
- Ofsted (2009). *English at the crossroads: An evaluation of English in primary and secondary schools, 2005/08*. London: Ofsted. Retrieved April 7, 2023, from <https://dera.ioe.ac.uk/298/1/English%20at%20the%20crossroads.pdf>
- Perry, D. G., & Pausetti, R. E. (2011). Gender and adolescent development. *Journal of Research on Adolescence*, *21*(1), 61–74. <https://doi.org/10.1111/j.1532-7795.2010.00715.x>
- Proctor, C., Linley, P. A., & Maltby, J. (2009). Youth life satisfaction measures: A review. *The Journal of Positive Psychology*, *4*(2), 128–144. <https://doi.org/10.1080/17439760802650816>
- Putwain, D. W., & von der Embse, N. P. (2021). Cognitive-behavioral intervention for test anxiety in adolescent students: Do benefits extend to school-related wellbeing and clinical anxiety. *Anxiety, Stress, and Coping*, *34*(1), 22–36. <https://doi.org/10.1080/10615806.2020.1800656>
- Rabe-Hesketh, S., & Skrondal, A. (2006). Multilevel modelling of complex survey data. *Journal of the Royal Statistical Society: Series A (statistics in Society)*, *169*(4), 805–827.
- Rees, G., Goswami, H., Pople, L., Bradshaw, J. Keung, A., & Main, G. (2012) *The Good Childhood report 2012*, The Children's Society. Retrieved April 7, 2023, from <https://www.childrensociety.org.uk/what-we-do/resources-and-publications/publications-library/good-childhood-report-2012>
- Rees, G. & Main, G. (2015) *Children's views on their lives and well-being in 15 countries: A report on the Children's Worlds survey, 2013–14*. Retrieved April 7, 2023, from www.isciweb.org
- Salmela-Aro, K. (2011). Stages of adolescence. In B. B. Brown & M. J. Prinstein (Eds.), *Encyclopedia of Adolescence* (pp. 360–368). Academic press. <https://doi.org/10.1016/B978-0-12-373951-3.00043-0>
- Schirripa, F., Salvati, N., D' Agostino, A., & Nicaise, I. (2018). The use of sampling weights in the M-quantile random-effects regression: An application to PISA mathematics scores. Retrieved April 7, 2023, from <http://arxiv.org/abs/1802.08004>
- Silva, L. C. da, & Matos, D. A. S. (2017). Indiscipline in Pisa: between intra- and extra-school factors. *Estudos em Avaliação Educacional*, v. 28, p. 382–416, 2017. Retrieved April 7, 2023, from <http://www.repositorio.ufop.br/handle/123456789/9511>
- Smith, T. E., & Sheridan, S. M. (2019). The effects of teacher training on teachers' family-engagement practices, attitudes, and knowledge: A meta-analysis. *Journal of Educational & Psychological Consultation*, *29*(2), 128–157. <https://doi.org/10.1080/10474412.2018.1460725>
- Steinmayr, R., Crede, J., McElvany, N., & Wirthwein, L. (2016). Subjective well-being, test anxiety, academic achievement: Testing for reciprocal effects. *Frontiers in Psychology*, *6*, 1994. <https://doi.org/10.3389/fpsyg.2015.01994>
- Steinmayr, R., Heyder, A., Naumburg, C., Michels, J., & Wirthwein, L. (2018). School-related and individual predictors of subjective well-being and academic achievement. *Frontiers in Psychology*, *9*, 2631. <https://doi.org/10.3389/fpsyg.2018.02631>
- Stiglitz, J. E. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Retrieved April 7, 2023, from www.stiglitz-sen-fitoussi.fr

- Su, R., Rounds, J., & Armstrong, P. I. (2009). Men and things, women and people: A meta-analysis of sex differences in interests. *Psychological Bulletin*, 135(6), 859–884. <https://doi.org/10.1037/a0017364>
- Tanner, J. L., & Arnett, J. J. (2016). The emergence of emerging adulthood: The new life stage between adolescence and young adulthood. In A. Furlong (Ed.), *Routledge handbook of youth and young adulthood* (2nd ed., pp. 39–46). Routledge.
- Taylor, L. J., DeNeve, J-E., DeBrost, L., & Khanna, D. (2022). *Wellbeing in Education in Childhood and Adolescence (Report No. 1)*. International Baccalaureate Organisation. Retrieved April 7, 2023, from <https://ibo.org/research/policy-research/well-being-in-education-in-childhood-and-adolescence-2022/>
- The Children's Society (2022). *The Good Childhood Report 2022*. Retrieved April 7, 2023, from <https://www.childrenssociety.org.uk/sites/default/files/2022-09/GCR-2022-Full-Report.pdf>
- Tsai, S. L., Smith, M. L., & Hauser, R. M. (2018). Gender gaps in student academic achievement and inequality. *Research in the Sociology of Education*, 20, 181–218. <https://doi.org/10.1108/S1479-353920180000020008>
- Van Hek, M., Kraaykamp, G., & Pelzer, B. (2018). Do schools affect girls' and boys' reading performance differently? A multilevel study on the gendered effects of school resources and school practices. *School Effectiveness and School Improvement*, 29(1), 1–21. <https://doi.org/10.1080/09243453.2017.1382540>
- Verkuyten, M., & Thijs, J. (2002). School satisfaction of elementary school children: The role of performance, peer relations, ethnicity and gender. *Social Indicators Research*, 59(2), 203–228. <https://doi.org/10.1023/A:1016279602893>
- Warrington, M., Younger, M., & Williams, J. (2000). Student attitudes, image and the gender gap. *British Educational Research Journal*, 26(3), 393–407. <https://doi.org/10.1080/01411920050030914>
- Yeo, L. S., Goh, V. G., & Liem, G. A. D. (2016, February). School-based intervention for test anxiety. In *Child & Youth Care Forum* (Vol. 45, pp. 1–17). Springer US

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.