Does school impact adolescents’ life satisfaction differently for students of different socio-economic status? A comparative study in 33 countries

Jose Marquez

Faculty of Education, University of Cambridge, Cambridge, UK

ABSTRACT
Research shows that school is one of the most important life domains shaping adolescents’ life satisfaction (LS) and this influence varies across countries and different groups of students (e.g. by gender). However, there is a lack of cross-country comparative research studying the links between school and students’ LS and how this differs across socioeconomic status (SES). This study explores this question using multilevel regression to analyse data from the 2015 Programme for International Students Assessment study on 15-year-old students in 33 countries. Two measures of SES were considered: material well-being and a composite SES measure. Results indicate that 1) in some countries, distinct school-related factors may shape students’ LS differently for students of higher and lower SES, 2) although there are some general patterns across countries for some school factors (bullying, academic competence, and parents’ support in relation to school are more strongly associated with LS among students of lower SES), for most school factors, the picture is mixed, and 3) in around half of the countries, schools seem to moderate the association between SES and students’ LS. Research and policy implications are discussed.

1. Background
The last four decades – and particularly the last ten years- have witnessed an increasing interest in subjective well-being (SWB) (Diener, Oishi, & Tay, 2018; Diener, Suh, Lucas, & Smith, 1999). In 2008, the President of the French Republic, Nicholas Sarkozy, promoted the creation of a commission to assess the limits of GDP as an indicator of economic performance and social progress and evaluate alternative metrics to assess progress in our societies. The result of this initiative was the highly influential report by the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz, 2009), which advised that social progress should be assessed using SWB indicators. Since then, efforts to assess SWB have grown significantly worldwide (Diener et al., 2018).

In the case of children and adolescents, great progress has been achieved in recent years in measuring and understanding SWB and we know much more about their SWB and how to promote it than only a decade ago (Casas, 2011; Marquez & Main, 2020;...
Rees et al., 2013; Rees & Main, 2015; The Children’s Society, 2020). One of the most important life domains shaping adolescents’ SWB is school, and research shows that the association between school and adolescents’ SWB differs across societies (Marquez & Main, 2020; Rees & Main, 2015) and groups – e.g. by gender (Marquez, 2020). This study explores if and how the relationship between school and adolescents’ SWB (in particular, life satisfaction (LS)) varies for adolescents of different socioeconomic status (SES), and how this differs across societies and measures of SES.

1.1. Conceptualising subjective well-being and socioeconomic status

SWB has been defined as the cognitive and affective evaluation of one’s life (Diener, Lucas, & Oishi, 2002). The cognitive aspect refers to a person’s satisfaction with life or with a particular aspect of life. The affective component consists of the emotions, moods and feelings experienced by the individual, which can be positive (e.g. joy, affection, confidence, etc.) and negative (sadness, anxiety, shame, etc.). In this study, the focus is on the cognitive element of SWB, which is more stable over time than the affective dimension (Eid & Diener, 2004). In particular, I focus on LS, which is the most common SWB indicator used in research on SWB among children and adolescents (Proctor, Linley, & Maltby, 2009).

The academic literature conceptualises SES as the socially derived economic factors which define the positions held by individuals or groups within the multiple-stratified structure of a society (Lynch & Kaplan, 2000). This is considered a multidimensional construct and, consequently, it is often studied with reference to different elements. Most often, these are education level, occupational level and a material element, most often financial income (Galobardes, Shaw, Lawlor, Lynch, & Davey Smith, 2006; McLaughlin et al., 2011). To account for the fact that children are dependent on their parents’ socioeconomic circumstances, research on children and adolescents uses an adapted version of these three elements, which includes parents’ education level, parental occupation, and material well-being. Moreover, many studies assess the SES of children using composite indices. These indices are derived from information in the 3 domains enumerated above. Furthermore, research shows that how we measure SES matters. In particular, in the case of children and the body of research studying the association between SES and child SWB, studies using measures of material deprivation instead of measures of family income have been more successful at finding evidence of this association (Gross-Manos, 2017; Knies, 2012; Main, 2014; Rees, Pople, & Goswami, 2011; Sarriera et al., 2014; Zaborskis, Iliosnky, Tesler, & Heinz, 2019). Likewise, evidence of this association is even more robust when child-derived measures of material well-being reveal -rather than adult-derived measures- are used (Lau & Bradshaw, 2018; Main, 2014). For this reason, two measures of SES are used in this study: a measure of material well-being and a composite SES measure.

1.2. School and adolescents’ subjective well-being

Research shows that, in the case of adults, cross-country variation in SWB is largely explained by nation-level characteristics (Helliwell, Layard, & Sachs, 2015). However, in
the case of children, most of the variation is explained by factors in the close environment of the child, this is home, school and community (Lee & Yoo, 2015).

School has been identified as a key area shaping adolescents’ SWB and this is a life domain in which policy can make a clear difference. In a cross-national comparative study, Rees and Main (2015) found that cross-country variation regarding children’s feelings about school and school life is much greater than that in other domains such as health or safety. This study also showed that school is the area where SWB decreases the most from age 10 to 12 and this decline is more substantial in some countries than in others, suggesting that education systems in different countries can play an important role in shaping SWB. Likewise, several studies have shown that the school a child attends may explain a considerable proportion of the variance in her SWB (Clair, 2014; Klocke, Clair, & Bradshaw, 2014; Marquez, 2020; Marquez & Main, 2020).

The academic literature indicates that there is a range of factors in the school domain which can have a negative impact on children and adolescents’ SWB. These mainly include suffering from school-related anxiety/pressure; not feeling supported by parents in relation to school; having negative relationships with school peers and, especially, suffering bullying; having negative relationships with teachers; having a low sense of belonging at school; being truant; changing school too often; living in countries with less generous (or non-existent) preschool education policies, etc. (Bradshaw, Crouse, & Turner, 2017; García-Moya, Brooks, Morgan, & Moreno, 2014; Marquez & Main, 2020; Moreno, 2017; Newland, Lawler, Giger, Roh, & Carr, 2018; Rees et al., 2013).

Multiple studies have adopted an ecological approach (Bronfenbrenner, 1979) to study variations in child SWB (Clair, 2014; Marquez & Main, 2020; Newland et al., 2018). Ecological approaches focus on the influence of children’s different environments on their development and the interactions between them. Because, as noted above, most of the variation in children and adolescents’ SWB is explained by factors in their close environment (family, school, and community), adopting an ecological approach can be particularly useful in research on adolescents’ SWB. The study of interactions between factors in different environments can provide excellent insights into how SWB is influenced by these factors. For example, Cummins and Cahill (2000) argue that, in the case of the relationship between family income and child SWB, low income per se would not be a crucial explanatory factor. The links – they argue- would be better explained by the effects of low income in different important areas of children lives (e.g. safe environment, family relationships, health, material well-being, etc.). Thus, the study of SES (family domain), school factors (school domain) and how these interact to shape adolescents’ SWB can provide relevant insights into how adolescents’ SWB can be promoted, particularly given the extensive research that indicates that better off and worse off students have relatively different experiences at school (Brooks-Gunn & Duncan, 1997; Engel & Black, 2008; Wagmiller & Adelman, 2009). There is a lack of research investigating how school and SES interact to impact adolescents’ SWB, and how this differs across countries. This study aims to fill this gap.

1.3. Aim and research questions

The present study is part of a broader research project investigating how students’ LS may be shaped by school and education. As part of this research project, Marquez and
Main (2020) investigated the association between schools and education policy and students’ LS in a large number of countries and Marquez (2020) explored how this differs by gender. This study presents the results of the third and last part of this research project. The aim was to draw on Bronfenbrenner’s ecological systems theory (1979) to address the research gap described in the previous section. To investigate this, I study the following research questions:

1. How do school and SES interact to shape students’ LS?
   a. Does school impact students’ LS in different ways for students of different SES?
   b. Can school moderate the impact of SES on students’ LS?
2. Does this differ across countries and measures of SES?

2. Methods and data

2.1. PISA 2015

This study uses data from the Programme for International Student Assessment (PISA) study 2015 by the Organisation for Economic Co-operation and Development (OECD). Participants in this study – which is conducted every 3 years in a large number of countries and economies- are 15-year-old students. Traditionally, PISA has focused on assessing the academic performance of students. However, this study also collects a large amount of data on education policy and practice and, particularly since 2015, the broader well-being of students. This includes multiple measures of SES and SWB data – specifically, data on students’ LS.

The present study focuses on 33 countries and economies: 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 USA. Throughout this paper, to facilitate the reading, I refer to all of them as countries regardless of the status of Hong Kong and Taiwan and the fact that in China, data was only collected in the regions and cities of Beijing, Shanghai, Jiangsu and Guangdong (B-S-J-G from now on).

2.2. Variables

The only dependent variable studied was a single-item scale measuring overall LS on a scale from 0 to 10.

As independent variables, I studied 2 measures of SES together with 39 variables which were considered in this research to study potential explanatory factors of students’ LS (Marquez, 2020; Marquez & Main, 2020). Only 8 of these variables were studied to assess whether their relationship with adolescents’ LS differed across SES (i.e. exploring interaction effects with the 2 SES measures) while the rest were treated as control variables. These control variables were retained in the models only when they improve the model fit (see more details in section 2.3) and are enumerated in Table A2 in Appendix A, which provides an overview of how these variables relate to students’ LS (see Marquez and Main (2020) for a further discussion on this).
The 2 SES measures studied were PISA’s composite index of economic, social and cultural status (ESCS) and the main material well-being index used in PISA – i.e. the index of household possessions. Details about the specific items considered in these indices can be found in PISA’s Technical Report (OECD, 2017). These measures – and all the PISA indices studied in this research– were estimated by standardising the original PISA variables with reference to each country so that in each of these variables 0 indicates the mean in each country and 1 the standard deviation.

The 8 school factors considered in the interactions with SES are the indices of schoolwork-related anxiety (derived from PISA’s ANXTEST index), sense of belonging at school (BELONG), frequency of being bullied (beingbullied), feeling unfairly treated by teachers (unfairteacher), feeling emotionally supported by parents in relation to school (EMOSUPPS), academic competence (students’ mean score in reading, maths and science), truancy (skipping and arriving late to school), and valuing cooperation and teamwork (CPSVALUE). The 8 variables were selected on the basis that these are school-related factors in a range of relevant school areas that are potentially amenable by education policy interventions and which are associated with students’ LS in, at least, around half of the countries studied (Marquez & Main, 2020). Policy amenability for some of these variables may seem questionable at first sight. This is the case of valuing cooperation and teamwork, for example, which may be strongly related to personality. However, there is evidence suggesting that schools may promote more positive attitudes towards cooperation (Gillies, 2004; Glâveanu, Branco, & Neves-Pereira, 2016). Another example is feeling emotionally supported by parents in relation to school. In this case, however, the items behind this variable (which includes statements like “My parents are interested in my school activities; My parents support me when I am facing difficulties at school, etc.; see more details in PISA’s Technical Report (OECD, 2017)) suggest that – although indirectly- students” feelings regarding their parents’ support in relation to school could be influenced by education policy interventions intended to promote parents’ involvement in the school, and there is research studying possible strategies to facilitate this (Bouakaz, 2007; Park & Holloway, 2013). Thus, although these 8 factors differ in the degree to which they may be considered to be policy amenable, all of them are relevant to address the research questions that this study aims to answer.

2.3. Analysis

In the first part of the analysis, I estimated the interaction effects between 8 school-related factors and SES measures. In the second part, I studied SES random effects on students’ LS. In addition, to help with the interpretation of these results, in Appendix A, I present an analysis of the direct association between SES measures and students’ LS and between school factors and LS.

The process of building the multilevel regression models involved a top-down strategy to define the fixed part of the model (see Hox, 2010, p. 55; West, Welch, & Gatecki, 2007) where non-statistically-significant variables were not retained (except essential control variable (gender and the SES) which were retained in all models). These are the 33 final 2-level multilevel models (Model A) for each country (with students at level 1 and schools at level 2), which use the composite ESCS index as a measure of SES and whose results are presented and discussed in Marquez and Main.
In the present study, 33 additional models (Model B) were estimated following the same approach but using the index of home possession as a measure of SES – rather than the ESCS index. The study of interaction effects involved the creation of 16 (8x2) additional models for each country, one for each combination of the 8 school-related factors and the 2 SES measures -i.e. models A1-A8 (ESCS composite index of SES) and model B1-B8 (the material well-being index of home possessions). These models maintained the same control variables retained in the final models (Model A and Model B), this is those relevant to explain variation in adolescents’ LS.

Multilevel models were estimated using maximum likelihood (Hox, 2010, p. 55; West et al., 2007). Furthermore, I applied weights at school and student levels, and final student weights were scaled using the scale method presented by Rabe-Hesketh and Skrondal (2006) – for a detailed discussion on why this is needed see Laukaityte and Wiberg (2018). Moreover, to deal with missing data, the analysis excludes those countries where the proportion of missing data in variables of interest was above 20%. In the countries included in the analysis, I used listwise deletion, which is common in multilevel analyses using PISA data (Da Silva & Matos, 2017; Schirripa, Salvati, D’Agostino, & Nicaise, 2018; Tsai, Smith, & Hauser, 2018; van Hek, Kraaykamp, & Pelzer, 2018).

3. Results

3.1. School-related factors, socioeconomic status and students’ life satisfaction

The results of the interaction effects between SES and 8 school-related factors are presented in Table 1. Interaction effects indicate that the impact of a school-related factor in students’ LS differs depending on the SES of the student. Similarly, it can also be interpreted as the impact of SES on students’ LS being shaped by school-related factors.

As summarised in Table A2 in Appendix A and described and discussed in more detail in Marquez and Main (2020), schoolwork-related anxiety had a negative effect on students’ LS in all countries, which was greater among students of lower SES (i.e. a positive interaction was found) in 3 countries -Iceland, Slovakia and the USA- and smaller (negative interaction) in 2 – Thailand and Austria (see models A1 and B1 in Table 1). In most cases, the effect size of the interaction was about 0.1 points, which indicates that an increase of 1 standard deviation in the specific SES index (i.e. the ESCS index or the home possessions index) increased/decreased the negative effect of schoolwork-related anxiety on students’ LS by approximately 10%.

Sense of belonging at school was positively associated with students’ LS in 14 countries (see Table A2 in Appendix A) and this effect was greater among students of higher SES in Croatia and Latvia and smaller in Hong Kong (see models A2 and B2 in Table 1). For both negative and positive interactions, the effect size of the interaction ranged between 0.05 and 0.10.

Bullying had a strong negative effect on students’ LS in all countries but South Korea (see Table A2 in Appendix A). In 6 countries, this effect was greater among students of lower SES -Austria, China (B-S-J-G), Iceland, Poland, Spain, Switzerland (see models A3 and B3 in Table 1). The effect size of the interactions was about 0.1 points in most cases.
Table 1. Socioeconomic status, school factors and students’ life satisfaction: interaction effects detailed by country.

| School factor                              | SES considered in the interaction | Country     | School factor (direct effect) | Interaction |
|--------------------------------------------|-----------------------------------|-------------|------------------------------|-------------|
| Index of schoolwork-related anxiety        | ESCS index (Model A1)             | Thailand    | −0.24*** (0.04)              | −0.11* (0.05) |
|                                             | Index of home possessions (Model B1) | Austria   | −0.46*** (0.05)              | −0.08* (0.04) |
|                                             |                                   | Iceland    | −0.57*** (0.06)              | 0.10* (0.05)  |
|                                             |                                   | Slovakia   | −0.39*** (0.04)              | 0.10* (0.05)  |
|                                             |                                   | USA        | −0.43*** (0.05)              | 0.11** (0.04) |
| Index of sense of belonging at school      | ESCS index (Model A2)             | Hong Kong  | 0.06 (0.04)                  | −0.10** (0.04) |
|                                             | Index of home possessions (Model B2) | Croatia    | 0.13** (0.05)               | 0.08* (0.04)  |
|                                             |                                   | Latvia     | 0.13** (0.05)               | 0.05* (0.03)  |
|                                             |                                   | Austria    | −0.19*** (0.04)             | 0.10* (0.04)  |
|                                             |                                   | Switzerland | −0.25*** (0.05)             | 0.13*** (0.04) |
|                                             |                                   | Spain      | −0.26*** (0.03)             | 0.12*** (0.03) |
|                                             |                                   | Iceland    | −0.30*** (0.06)             | 0.12* (0.05)  |
|                                             |                                   | Spain      | −0.25*** (0.03)             | 0.10*** (0.03) |
|                                             |                                   | Poland     | −0.30*** (0.05)             | 0.11* (0.05)  |
|                                             |                                   | China (B-S-J-G) | −0.17*** (0.04)           | 0.07* (0.04)  |
| Index of feeling unfairly treated by teachers | ESCS index (Model A4)             | Iceland    | −0.06 (0.05)                | 0.10* (0.05)  |
|                                             | Index of home possessions (Model B4) | Thailand  | −0.05 (0.06)                | −0.12*** (0.04) |
| Index of feeling emotionally supported by parents | ESCS index (Model A5)           | Switzerland | 0.44*** (0.06)             | −0.11* (0.05)  |
|                                             | Index of home possessions (Model B5) | Finland    | 0.48*** (0.03)             | −0.09*** (0.03) |
|                                             |                                   | Iceland    | 0.30*** (0.05)             | −0.18*** (0.05) |
|                                             |                                   | Poland     | 0.69*** (0.05)             | −0.12* (0.05)  |
| Index of academic competence               | ESCS index (Model A6)             | Luxembourg | −0.13* (0.05)              | 0.11* (0.04)  |
|                                             | Index of home possessions (Model B6) | Slovenia    | −0.18*** (0.05)            | 0.12* (0.05)  |
|                                             |                                   | Greece     | −0.14* (0.06)              | 0.15* (0.05)  |
| Index of valuing cooperation and teamwork  | ESCS index (Model A7)             | Latvia     | −0.05 (0.05)                | 0.08* (0.04)  |
|                                             | Index of home possessions (Model B7) | France     | 0.13** (0.05)              | −0.12* (0.05)  |
|                                             |                                   | Spain      | 0.19*** (0.04)             | −0.11** (0.04) |
| Index of truancy                           | ESCS index (Model A8)             | Iceland    | 0.22*** (0.05)             | −0.09* (0.04)  |
|                                             | Index of home possessions (Model B8) | Peru       | 0.13* (0.07)                | −0.10* (0.05)  |
|                                             |                                   | Slovakia   | 0.11** (0.04)              | 0.13* (0.07)  |
|                                             |                                   | Chile      | −0.12** (0.05)             | 0.08* (0.04)  |
|                                             |                                   | Ireland    | −0.07 (0.04)                | 0.09* (0.03)  |
|                                             |                                   | Luxembourg | −0.09 (0.05)                | −0.08* (0.03)  |
|                                             |                                   | Mexico     | −0.08* (0.04)              | 0.10* (0.04)  |

*p < .05, **p < .01, and ***p < .001.

In 26 countries, feeling unfairly treated by teachers was negatively associated with students’ LS (see Table A2 in Appendix A). This effect was greater among students of lower SES in Iceland and smaller in Thailand (see models A4 and B4 in Table 1). The
effect size of the interaction was about 0.1 points for both positive and negative interactions.

In all the countries studied, feeling emotionally supported by parents positively related to students’ LS (see Table A2 in Appendix A) and this relationship was stronger among students of lower SES in 5 countries - Croatia, Finland, Iceland, Poland and Switzerland (see models A5 and B5 in Table 1). The effect size of the interaction ranged approximately between 0.10 and 0.15 points.

In 21 countries, academic competence negatively related students’ LS (see Table A2 in Appendix A) and this relationship was stronger among students of lower SES in Greece, Latvia, Luxembourg and Slovenia (see models A6 and B6 in Table 1). The size of the effect of the interactions was between 0.10 and 0.15 points, approximately.

In 28 countries, valuing cooperation and teamwork positively related to students’ LS (see Table A2 in Appendix A). As shown in models A7 and B7 in Table 1, in France, Iceland, Peru and Spain, negative interactions were found, while a positive interaction was observed in Slovakia (effect size of 0.10 point in most cases).

Truancy negatively related to students’ LS. In 16 of 33 countries studied (see Table A2 in Appendix A). In Chile, Ireland and Mexico, the relationship was stronger among students
of lower SES and in Luxembourg, this relationship was weaker (see models A8 and B8 in Table 1). For both positive and negative interactions, the effect size was about 0.1 points.

Finally, Table 2 shows the results of the SES random effects. Statistically significant effects are highlighted in bold. There where a statistically significant random effect is observed this suggests that the influence of SES in students’ LS varies across schools, which is further evidence of how SES and school interact to impact students’ LS. As indicated in Table A1 in Appendix A, SES negatively relates to students’ LS in 26 out of 33 countries and, as shown in Table 2, in 16 of these countries, statistically significant random effects were found for either SES measure. In particular, this was observed in 14 countries for the composite ESCS index and in 10 countries for home possessions.

4. Discussion

4.1. Main findings

The results presented in the previous section provide evidence to answer the research questions posed in section 1.3. The first part of the analysis showed that school may influence students’ LS in different ways for students of different SES. For the 8 school factors studied, interactions between these factors and SES were observed in 21 out of 33 countries, which provides further support to the idea – supported by evidence from previous studies (Casas & González, 2017; Marquez, 2020; Rees & Main, 2015)- that adolescents of different characteristics may have different experiences at school shaping their SWB in different ways.

A closer look at the results reveals some clear patterns across countries for 3 of these factors. The positive effect on students’ LS of feeling emotionally supported by parents in relation to school (observed in all countries), the negative effect of bullying (observed in all countries but South Korea), and the negative effect of academic competence (observed in 21 countries) are greater among students of lower SES than among students of higher SES. This was found in 5, 6 and 4 countries respectively. This suggests that, at least in these countries, policy interventions concerning bullying or parental involvement may need to target students of lower SES in particular. Although further research is needed, some speculative explanations can be considered. In the case of bullying, it may be the case that, in some countries, SES may ease the suffering associated to being bullied -i.e. you may be bullied but at least you have good things in your life which other students lack (e.g. material resources, other types of resources, lower levels of parental stress at home related to economic difficulties, etc.). As to parents’ support in relation to school, it may be that those who struggle more at school due to the lack of resources associated with their socio-economic disadvantage value more that their parents are understanding of these difficulties, compared to those who do not face these socio-economic difficulties. In the case of academic competence, interpretations are difficult as the negative direct association between academic competence and students’ LS found in this research (see Marquez & Main, 2020) contradicts evidence from previous research indicating the existence of a positive association (see meta-analysis by Bücker, Nuraydin, Simonsmeier, Schneider, & Luhmann, 2018), which, perhaps, can be due to the fact that there is nothing at stake in the PISA test and too many students may not take it seriously enough. Finally, apart from these 3
factors which reveal some patterns across countries, for the other school factors studied in the interactions, the picture is less clear as, for each of them, positive interactions were observed in some countries and negative in others.

Furthermore, in all these countries interactions were found for 1 or 2 of these factors, with the only exception of Iceland, where interactions were observed for 5 of the 8 school factors studied. Thus, this is a country where evidence of differences between students of higher and lower SES in how experiences at school impact students’ LS is particularly solid. As to differences between measures of SES, results are mixed overall and, for most factors, interactions are found for both measures in a similar number of countries and with similar effect size.

Overall, despite the general patterns observed for a few school factors, the complex picture affecting most of these factors in their interaction with SES and LS seems to reflect the relatively different realities experienced by adolescents in different societies. Explanations as to why some results are found in some countries and not in others are difficult due to the diverse nature of countries in which these interactions are observed and, consequently, future research should study what may explain these differences across countries. The main policy implication of these findings is that interventions intended to promote adolescents’ LS in schools may need to be sensitive to SES differences. However, because results differ across countries and factors, it is important that policymakers have access to data that is representative of their population, containing high-quality information about factors that may shape students’ LS. Ideally, representative data at lower administrative levels should also be collected, as we know that adolescents’ SWB is mainly shaped by factors in their close environment (i.e. family, school and community) and these are likely to differ geographically within countries.

The analysis also showed that, out of 33 countries, the positive effect of students’ SES on LS (observed in 26 countries) varied across schools in 16 of them, suggesting that it matters attending one school or another. These findings are in line with those observed in previous studies in the field (Clair, 2014; Klocke et al., 2014; Marquez & Main, 2020). However, these results need to be interpreted with caution because, although the existence of SES random effects suggests that the environment specific to each school would moderate the impact of SES in students’ LS, this might occur either via school responses to students’ SES or via characteristics of the school environment which are not necessarily defined by school responses to differences in students’ characteristics. For example, these effects could reflect the selection and sorting of students of certain characteristics who may be more like to attend some schools than others, and may also be capturing – not only school effects but also- some area of residence effects. The collection and analysis of data at a lower administrative level would help distinguishing better between school effects and area of residence effects.

Also, again, there is not a clear cluster of countries where random effects are found and so future research should study why schools seem to have a moderating role in the association between SES and students’ LS in some countries and not in others. Moreover, although there are differences across SES measures in terms of the number of countries where random effects were found (14 countries for the composite ESCS index and in 10 for the home possessions index) and the size of the effect, as in the case of the interaction effects discussed above, the picture is complex with regards differences between SES measures. These differences seem far more relevant
regarding the direct association between SES and students’ LS reported in Table A1 in Appendix A. This association is observed in more countries – and the size of the effect tends to be larger when SES is measured in terms of material well-being (home possessions) rather than a composite index of SES (ESCS index). The latter is in line with findings from previous research suggesting on children’s SWB suggesting that how we measure SES matters (Gross-Manos, 2017; Knies, 2012; Lau & Bradshaw, 2018; Main, 2014; Rees et al., 2011; Sarriera et al., 2014; Zaborskis et al., 2019). This also indicates that material well-being is an important factor influencing adolescents’ LS. Thus, to promote children and adolescents’ SWB, policymakers should focus on developing interventions that help increase adolescents’ material well-being via improving the financial situation of families and by promoting that schools facilitate access to certain material resources, especially by targeting those more materially deprived.

All in all, this study found evidence that school and SES interact to shape students’ LS. It seems that school may shape how students experience their SES – and that SES may influence adolescents’ experiences at school- but how this operates exactly may differ significantly across societies. Importantly, it is also likely that this differs geographically within countries, as research indicates that adolescents’ LS is mainly affected by factors in the close environment of the child, this is home, school and community (Lee & Yoo, 2015). Researchers and policy-makers interested in if and how schools and education systems can promote students’ SWB should further study this question at the national level – and, ideally, also at lower administrative levels- to identify country/region/local-specific issues and whether some particular groups may benefit more from certain interventions.

4.2. Limitations

This study was affected by several limitations, which are mainly the result of data availability limitations. First, LS was the only SWB variable studied and results might be different if other SWB measures – both cognitive and affective- were used. Second, the material well-being index of home possessions seems to have followed an adult-based approach – rather than a child-derived one- to determine what is important in adolescents’ lives (OECD, 2017) and, therefore, the relevance of material well-being to adolescents’ SWB may be underestimated. Third, LS data are often negatively skewed and this might affect the validity of some of the results. Fourth, despite adopting a rather conservative approach to deal with missing data -which has previously been applied in multilevel analysis using PISA data (Da Silva & Matos, 2017; Schirripa et al., 2018; Tsai et al., 2018; van Hek et al., 2018)- levels of missing data in some cases may affect the validity of the results presented in some models. Fifth, although solid evidence on the links between school, SES and LS are presented in this study, causal methods were not used and, therefore, caution is needed when interpreting this evidence. And finally, this study focused on 15-year-old adolescents who are enrolled in mainstream education, mainly in high-income countries, which represents a rather restrictive definition of adolescence.
5. Conclusions

School and education may shape adolescents’ SWB in different ways for better off and worse off students and schools may have the capacity to moderate the impact of SES in students SWB. However, this seems to differ across countries. These findings suggest that schools and education policy can play an important role in promoting adolescents’ SWB but public policy interventions need to be sensitive to SES differences and account for geographic differences as well, also within countries. As revealed by several studies, the association between school and students’ SWB is complex and adopting a more nuanced approach to study how different elements of the adolescent’s ecology interact to shape SWB may advance our understanding of how societies can make adolescents happier.

Disclosure statement

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Notes on contributor

Jose Marquez is a quantitative social researcher working as an ESRC Postdoctoral Fellow in the Faculty of Education at the University of Cambridge. My substantive areas of research interest include wellbeing, education and migration. I am particularly interested in how public policy can improve the subjective well-being and mental health of children and young people, and how this differs across groups (gender, immigrant background, etc.) and countries.

ORCID

Jose Marquez @ http://orcid.org/0000-0002-6304-4444

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### Table A1. The direct effect of socioeconomic status on students’ life satisfaction.

| Country                  | ESCS index (Model A) | Index of home possessions (Model B) |
|--------------------------|----------------------|-------------------------------------|
|                          | b        | SE      | Country                  | b         | SE      |
| Czech Republic           | 0.24***  | (0.04)  | China (B-S-J-G)          | 0.36***   | (0.05)  |
| UAE                      | 0.21***  | (0.04)  | UAE                     | 0.35***   | (0.04)  |
| Taiwan                   | 0.18***  | (0.03)  | Bulgaria                | 0.34***   | (0.07)  |
| Qatar                    | 0.17***  | (0.04)  | Turkey                  | 0.34***   | (0.08)  |
| Chile                    | 0.17**   | (0.06)  | France                  | 0.30***   | (0.05)  |
| Slovakia                 | 0.15**   | (0.05)  | Estonia                 | 0.29***   | (0.05)  |
| Turkey                   | 0.14*    | (0.07)  | Qatar                   | 0.25***   | (0.04)  |
| Estonia                  | 0.14***  | (0.03)  | Chile                   | 0.24**    | (0.08)  |
| France                   | 0.13*    | (0.06)  | Taiwan                  | 0.23***   | (0.04)  |
| Croatia                  | 0.13**   | (0.04)  | Latvia                  | 0.21***   | (0.05)  |
| China (B-S-J-G)          | 0.13**   | (0.05)  | Thailand                | 0.21**    | (0.07)  |
| Russia                   | 0.13**   | (0.13)  | Czech Republic          | 0.20***   | (0.04)  |
| United States            | 0.12*    | (0.05)  | United States           | 0.20***   | (0.05)  |
| Latvia                   | 0.12*    | (0.04)  | Poland                  | 0.20**    | (0.06)  |
| Spain                    | 0.10*    | (0.04)  | Austria                 | 0.19***   | (0.04)  |
| Austria                  | 0.09*    | (0.04)  | Ireland                 | 0.19***   | (0.04)  |
| Iceland                  | 0.09*    | (0.04)  | Slovakia                | 0.17*     | (0.08)  |
| Bulgaria                 | 0.08     | (0.05)  | Hungary                 | 0.17***   | (0.05)  |
| Thailand                 | 0.08     | (0.06)  | Russia                  | 0.16**    | (0.06)  |
| Hungary                  | 0.08*    | (0.05)  | Hong Kong               | 0.16***   | (0.04)  |
| Hong Kong                | 0.07*    | (0.03)  | Portugal                | 0.15**    | (0.05)  |
| Ireland                  | 0.07     | (0.04)  | Spain                   | 0.14***   | (0.04)  |
| Colombia                 | 0.06     | (0.05)  | South Korea             | 0.14**    | (0.05)  |
| Switzerland              | 0.06     | (0.04)  | Peru                    | 0.14*     | (0.07)  |
| Mexico                   | 0.06     | (0.04)  | Iceland                 | 0.14**    | (0.05)  |
| Poland                   | 0.05     | (0.04)  | Croatia                 | 0.13***   | (0.04)  |
| South Korea              | 0.04     | (0.04)  | Mexico                  | 0.13*     | (0.05)  |
| Finland                  | 0.01     | (0.03)  | Luxembourg              | 0.09      | (0.05)  |
| Luxembourg               | 0.00     | (0.04)  | Slovenia                | 0.08      | (0.05)  |
| Greece                   | 0.00     | (0.05)  | Finland                 | 0.07      | (0.04)  |
| Peru                     | -0.01    | (0.05)  | Colombia                | 0.07      | (0.07)  |
| Portugal                 | -0.06    | (0.04)  | Switzerland             | 0.06      | (0.05)  |
| Slovenia                 | -0.09*   | (0.04)  | Greece                  | 0.06      | (0.06)  |

Notes: countries are ordered from greater to smaller effect size; *p < .05, **p < .01, and *** p < .001. Countries are ordered from greater to smaller effect size; *p < .05, **p < .01, and ***p < .001.

### Appendix A. Socioeconomic status and students’ life satisfaction

Table A1 shows the direct association between SES measures and students’ LS; and Table A2 reports on the direct association between each factor considered in this research and students’ LS (for further details, see Marquez & Main, 2020). As to the links between SES and LS, in general, there is a positive association between SES and students’ LS which is observed in 27 of the 33 countries studied. However, how SES is measured matters. The effect of home possessions on students’ LS is greater—and observed in a larger number of countries—than the effect of SES (as measured with the ESCS composite index) on students’ LS. This is, overall, the association between SES and students’ LS seems mainly explained by material well-being.
Table A2. Summary table of the effect of all predictor variables in the full ML model (model 2).

| Variable Description | Number of countries with available data | Number of countries where a statistically significant effect is found | Mean effect size* |
|----------------------|----------------------------------------|---------------------------------------------------------------|------------------|
| Girl                 | 33                                     | 28(−)                                                      | −0.43            |
| ESCS index (SES)     | 33                                     | 17(+), 1(−)                                               | 0.15 −0.09       |
| Index of schoolwork-related anxiety | 33     | 33(−)                                                      | −0.34            |
| Index of sense of belonging at school | 33     | 14(+)                                                      | 0.13             |
| Index of frequency of suffering bullying | 33     | 32(−)                                                      | −0.28            |
| Index of feeling unfairly treated by teachers | 33     | 26(−)                                                      | −0.19            |
| Index of feeling emotionally supported by parents in relation to school | 33     | 33(+), 1(−)                                               | 0.53             |
| Worked in the household or took care of other family members | 33     | 5(+), 1(−)                                                 | 0.19 −0.33       |
| Worked for pay       | 33                                     | 5(+)                                                      | [0.21] −[0.70]   |
| Studied for school or homework | 33     | 14(+), 1(−)                                               | 0.20 −0.63       |
| Read a book/newspaper/magazine | 33     | 1(+), 1(−)                                                 | 0.24 −0.39       |
| Played videogames    | 33                                     | 2(+), 1(−)                                                 | 0.15 −0.40       |
| Watched TV/<DVD>/Video | 33    | 3(+)                                                      | 0.23 −0.70       |
| Met friends or talked to friends on the phone | 33     | 7(+)                                                      | 0.18 −0.45       |
| Internet/Chat/Social networks (e.g. <Facebook>) | 33     | 2(+)                                                      | 0.32 −0.60       |
| Talked to parents    | 33                                     | 24(+), 1(−)                                               | 0.37 −1.44       |
| Had breakfast        | 33                                     | 25(+), 1(−)                                               | 0.39             |
| Had dinner           | 33                                     | 4(+)                                                      | 0.59             |
| Days of vigorous exercise outside school last week | 33     | 22(+)                                                     | 0.20 −0.73       |
| Learning time at school (minutes per week) | 33     | 3(+)                                                      | 0.12             |
| Out-of-school study time per week (hours) | 33     | 2(+)                                                      | 0.15             |
| Index of time spent using ICT at school in general | 29     | 3(+)                                                      | 0.15             |
| Index of time spent using ICT outside school for schoolwork | 29     | 7(+)                                                      | 0.14             |
| Index of time spent using ICT at home for leisure | 29     | 1(+), 2(−)                                               | 0.12 −0.15       |
| Index of academic competence | 33     | 21(−)                                                      | −0.18            |
| Index of truancy     | 33                                     | 16(−)                                                      | −0.14            |
| Index of valuing cooperation | 33     | 28(+)                                                      | 0.18             |
| Having repeated a grade at least once | 33     | 2(−)                                                      | −0.40            |
| Years attended pre-primary education | 33     | 3(−)                                                      | [0.43] −[1.14]   |
| Education programme attended | 33     | 2(−)                                                      | [0.21] −[0.30]   |
| School type          | 32                                     | 15                                                        | [0.16] −[1.23]   |
| Size of the community where the school is located | 33     | 9(−), 1(+)                                               | 0.29 −0.76       |
| School size (total school enrolment in hundreds) | 32     | 1(+)                                                        | −0.04 −0.02      |
| Average class size in the school | 33     | 2(−), 2(−)                                               | −0.02 −0.02      |
| Index of shortage of material and human school resources | 33     | 1(−)                                                      | −0.15            |
| Student/teacher ratio | 33                                     | 4(−)                                                      | −0.03            |
| Percentage of certified teacher in the school | 32     | 2(+)                                                      | 0.54             |
| Index of teachers’ behaviour hindering teaching | 33     | 3(−)                                                      | −0.12            |
| School practices ability grouping within classes | 33     | 1(+)                                                        | 0.19 −0.29       |
| School practices ability grouping between classes | 33     | 1(−)                                                      | −0.18            |

For continuous and dichotomous predictors, the mean effect in those countries where this is significant is provided. For categorical variables (effect size in italics), a range of the effect size (expressed in absolute terms) across different categories and countries and economies is provided. Detailed results by country are presented and discussed in Marquez and Main (2020).