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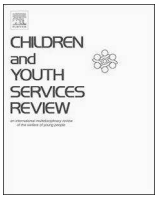

Bullying and subjective well-being: A hierarchical socioeconomical status analysis of Chilean adolescents

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ABSTRACT

Inequality is a major concern for governments and policymakers in poor's and developing countries. High levels of inequity negatively affect the lives of children and adolescents and their subjective well-being (SWB). Moreover, bullying behavior also harm the SWB of its victims. Previous studies have examined the negative consequences of bullying, but have failed to consider socioeconomic status (SES) and the nested effects of the school. The purpose of this study was to examine the effect of bullying on SWB by considering the role of SES at the school level. We examined a sample of 1,914 adolescents from 26 schools in two Chilean regions (mean age: 11.54 years; 47.1% female) using Hierarchical Linear Modeling with different subjective well-being measures at the student level. We used the type of school (private versus public) and socioeconomic status. Our results indicate a negative relationship between bullying and different measures of SWB. SES appears to be negatively related at the school level on well-being, which evidences other features to be considered in relation to prevention. This is evidence of the negative effects of levels of risk and inequality in Chilean schools on the subjective well-being of adolescents.

Inequality is a major concern for governments and policy makers in developing countries because of the negative effects on the lives of children and adolescents. Previous studies have examined the negative consequences of inequality, based on socioeconomic status (SES), on domains such as health, education, achievement, but other domains are missing, such as subjective well-being (SWB) among adolescents.

In Chile, the 2017 National Socioeconomic Characterization Survey (CASEN, 2017) reports that the wealthiest 10% of households earn 39.1 times more than the poorest 10% of households. In 2015, the wealthiest 10% of households earned 33.9 times more than the poorest 10%. In 2017, the poorest 50% of households had access to 2.1% of the country's net wealth, while the wealthiest 10% had access to 66.5% (Comisión Económica para América Latina y el Caribe, 2019). Moreover, the Gini Coefficient shows that Chile is one of the countries with the highest levels of concentration of wealth among OECD countries (OECD, 2019). Chile has the second highest income gap between the wealthiest 10% and the poorest 10% among OECD countries, led only by Mexico. According to World Bank estimates (2016), Chile occupies the tenth position in terms of economic inequality among Latin American countries for which the World Bank has records, and the fifth place if only South American are considered.

Latin America and the Caribbean continue to be the most economically unequal region in the world, above Sub-Saharan Africa (the second most). The average Gini index for the region is almost a third higher than that for Europe or Central Asia. In this regional context, Chile had a Gini inequality index of 0.45 in 2017, similar to the Latin American average of 0.47 (Economic Commission for Latin America and the Caribbean [ECLAC], 2019).

In 2010, Chile joined the Organization for Economic Cooperation and Development (OECD), with 31 other member countries from around the world. Chile is among the most unequal member countries (United Nations [UN], 2018), ranking second based on the Gini index before and after taxes and transfers (Mieres, 2020).

Experiences at school, such as bullying, can have both short- and long-term negative consequences for young individuals (Gini et al., 2019; Holt et al., 2015; Tsaousis, 2016; Wolke & Lereya, 2015). Previous studies have examined the effects of bullying on well-being without considering the nested effect of the school and the levels of SES to understand this effect better. Therefore, this study aims to analyze the relationship between bullying and adolescent well-being, while considering the nested effect of the school and the levels of vulnerability and risk, which can become a moderator of this relationship.

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1. Adolescent Well-Being Development

Subjective well-being is the psychological and psychosocial dimension of the quality of life and refers to the subjective assessment of one's life circumstances (Ben-Arieh, Casas, Frønes & Korbin, 2015; Diener et al., 2015). Some essential components of subjective well-being to be considered are: the affective or emotional component, represented by the affective balance (positive and negative affects); and the cognitive component, which refers to the evaluation of global satisfaction with life and specific aspects of this (Diener, 2017).

In the present work, subjective well-being has been approached from the cognitive component of satisfaction, which refers to all kinds of positive and negative evaluations that people make of their lives, which includes their experiences of life and the circumstances under which they live (Casas, 2015).

The literature consistently reports that adolescent well-being is a key component in achieving adequate mental health and is a determining factor for various positive aspects in the lives of children and adolescents (Dominguez-Guedea, 2016). Higher levels of life satisfaction are positively related to physical health, mental health, good interpersonal relationships and educational success (Park, 2014; Zappulla, Pace, Cascio, Guzzo & Huebner, 2014). Therefore, life satisfaction is linked to a wide range of physical, mental, school performance and emotional indicators, providing key psychological strengths (Ng et al., 2015).

The study of subjective well-being allows for determining risks, both in personal and social dimensions, which predict adolescent pathological states and behavioral problems (Puente-Díaz & Cavazos, 2013), and are negatively related to mental health problems (Shek & Liang, 2018). Subjective well-being provide protection against different risk factors such as criminal behavior, aggression, victimization, problematic Internet use, substance abuse, and risky sexual behavior (Shek & Liang, 2018).

Socioeconomic status is a significant dimension in explaining adolescent well-being, but so far with mixed results. It is particularly relevant to consider the level of poverty and inequality in the case of Chile and South America in general. The Chilean educational system maintains segregation as a common practice, dividing by schools according to socioeconomic level and within the classroom, according to the abilities of the students (Treviño et al.,2016). Chile has one of the most socioeconomically segregated education systems among the countries that participated in PISA 2015 (Organization for Economic Co-operation and Development [OECD], 2017). Nonetheless, the role of socioeconomic educational inequality in subjective well-being has not been studied in Chile.

1.1. Socioeconomic status and adolescent Well-being

Research about the negative effects of SES on adolescents have focused mostly on health, without considering dimensions like well-being and life satisfaction. Socioeconomic inequality is a relatively new area in adolescent health research, partly due to the conceptual and methodological difficulties in measuring the socioeconomic levels of adolescents (Currie et al., 2008), this being the subject of extensive debate today. There are few international studies on social inequity in adolescent health, and the ones that exist do not offer robust information (Elgar et al., 2015), and show contradictory results, depending on the type of measurement used (Moreno-Maldonado et al., 2017). Evidence from comparative studies suggests an existing, but inconclusive, relationship between income inequality and health (Lynch et al., 2004; Wilkinson & Pickett, 2006). Studies supporting this relationship show that the general population is healthier in societies with more equitable income distribution. Studies also suggest that more social and health problems emerge in less equitable societies (Pickett & Wilkinson, 2015; Wilkinson & Pickett, 2017), which can be a risk for adolescent well-being.

International studies that relate socioeconomic status and life satisfaction have mostly considered developed countries, evidencing a significant association between these variables (Levin et al., 2011; Zaborskis et al., 2018). For instance, Bradshaw, Keung, Rees & Goswami (2011) explored differences in the subjective well-being of adolescents from 29 European countries and found negative associations between the level of deprivation and life satisfaction. Levin et al. (2011) analyzed data from 35 countries and established that the Gross Domestic Product (GDP) correlates significantly and positively with adolescent life satisfaction. Conversely, the Gini coefficient showed an inverse correlation, evidencing that adolescent life satisfaction is higher in countries with more equitable income distribution. Lastly, Sarriera et al. (2014) analyzed the relationship between the perception of available material resources and the levels of subjective well-being in Algeria, Brazil, England, Israel, South Africa, South Korea, Spain and Uganda. Their results indicate that there is a positive relationship between the perception of available economic resources and welfare levels, except in South Korea.

Other studies within countries have found an effect of SES on child and adolescent well-being. For instance, Gadermann et al. (2015) found that children living in environments with high economic deprivation in Canada have a more negative sense of well-being, which could be related to the difficulty of accessing activities in their communities and to family stress. In a study in UK, Main (2014) found that adolescents from low-income households have lower satisfaction in the areas of family and life choices. Zou et al. (2018) studied the effect of family socioeconomic status on life satisfaction and the role of optimism as mediator between them among Chinese children and adolescents. Their results showed an association between socioeconomic inequality and satisfaction with life, where optimism acted as a partial mediator, but only for adolescents.

Evidence on subjective well-being and the quality of life of children and adolescents is scarcer in non-English speaking countries (Ben-Arieh, 2007). In particular, such studies are more limited in Latin American. However, the studies that have been conducted are consistent in recognizing a negative association between SES and SWB. For instance, a study involving 543 Brazilian adolescents and their parents indicated a reduced sense of well-being among lower middle-class participants than among middle and upper class participants, between whom no significant differences were observed (Bedin & Sarriera, 2014). Abreu and colleagues (2016) sought to establish the relationship between psychosocial stressors, the sense of community and the subjective well-being of children and adolescents. They concluded that students in socioeconomically disadvantaged public schools in urban Brazil are more exposed to everyday stress, score lower in life satisfaction and in their sense of community. However, other researchers argue for a different relationship. For instance, Oyanedel, Alfaro and Mella (2015), in a study in Chile, found that there is no clear relationship between the socioeconomic level (measured through the index of school vulnerability) and the subjective well-being of 8, 10 and 12 year old children.

Although there is evidence about the effect of SES on adolescent life satisfaction globally and to some extent in the Latin America context, studies from other cultural and economic contexts are needed because they can inform researchers and policymakers, especially if we consider contextual variables like school life and relationships with peers.

1.2. Well-being and bullying

School life experiences have a significant effect on adolescent well-being (Aldridge & McChesney, 2018). In particular, being a victim of bullying has been associated with lower levels of subjective well-being for children who report being beaten or excluded by their peers (Varela et al., 2018). Valois, Kerr and Huebner (2012) concluded that life satisfaction is related to the experience of victimization by bullying, in particular during early adolescence, and that specific racial or gender

groups are more at risk of being victims in schools. Conversely, there is less evidence about the relationship between life satisfaction and being a perpetrator of bullying in school. Based on a sample of 1,319 students aged 11 to 16 from the community of Valencia, Spain, Buelga, Musiti, Murgui and Pons (2008) found in adolescents who bully their peers have lower scores for life satisfaction. In a study conducted with 1,058 students 10 to 12 years old in Spain, it was found that those who experience social bullying and those who are social bullies, have lower scores on the scales of life satisfaction (Navarro, Ruiz-Oliva, Larrañaga & Yubero, 2013). Thus, Flaspohler, Elfstrom, Vanderzee, Sink, and Birchmeier (2009) argue that both those who are victims and perpetrators have lower levels of life satisfaction compared to their peers who do not report being either victims or victimizers. Savahl and colleagues (2018) found that being beaten or left behind explains 2% of the scores for student life satisfaction (SLSS) using a sample of children 8–12 years old from 15 countries (Savahl et al., 2018). Previous studies in Latin America have also provided evidence linking victimization by bullying to well-being. For example, Varela and colleagues (2018) used a sample of 802 Chilean 7th graders and found evidence linking school violence to life satisfaction, which was also mediated by school satisfaction. Oriol, Miranda, and Unanue (2020) used a sample of 568 adolescents living in residential care in Peru and found a connection with different cognitive and affective measures of SWB as a result of bullying victimization.

The experience of living in community with higher or lower levels of violence and deprivation, with the aforementioned consequences for well-being, is not indifferent to the contextual variables affecting the school at any given socioeconomic level. Although bullying is widespread, there is evidence that schools with predominantly low income students have higher incidences of violence, thus presenting greater risk of students being either aggressors or victims (Jansen et al., 2012; Wolke, Woods, Stanford, & Schulz, 2001). A study involving 16 countries and 56,000 children aged 8 to 12 found that children exposed to high levels of deprivation were exposed to higher rates of bullying and lower levels of personal welfare. The authors concluded that being victims of bullying is a more important in determining children's subjective sense of well-being in developed countries than in poor countries (Bradshaw, Crous, Rees, & Turner, 2017). Tiliouine (2014) established that bullying victimization is more present in boys and girls who belong to less favored economic contexts.

Some explanations for this relationship are that the poorest schools have shortages of resources and that their interests are broader than merely academic matters. As well, the neighborhoods in which these schools are located can explain the higher levels of violence than occur in schools in middle- or high-income areas (Jansen et al., 2012; Wolke et al., 2001). Zuze et al. (2016) found that more than half the students attending low-income South African schools experience some type of bullying weekly. In a study in which 12,514 students from 292 high-income public schools participated, Winnaar, Arends and Beku (2018) found that children from public schools in high-income areas are harassed less often than students attending schools in low-income areas. This is why SES levels are important in understanding the negative effect of bullying on adolescent well-being.

Therefore, the purpose of this study is to examine the effect of bullying on adolescent subjective well-being while considering the levels of SES of the schools where bullying occurs, which can become a moderator for this relationship. Thus, we examined whether the schools' socioeconomic status influences different consequences for the levels of well-being, considering the high levels of inequality that characterize Chile.

2. Method

2.1. Sample

We examined a sample of 1,914 adolescents (mean age: 11.56 years old; 47.1% female) from 26 urban schools in the two most populous regions of Chile. The sample includes all the currently active schools in the urban areas of the two regions according to a list provided by the Ministry of Education (http://datosabiertos.mineduc.cl/). A random sample of schools was selected from each urban area (Santiago and Concepción), and a class was randomly selected from each school. In cases where there were more than two classes per level in a school, the participation of the class was randomized. In some schools, there was only one class per level and in this case only one class was surveyed.

2.2. Data collection

We used self-reporting questionnaires completed by the participants, which were applied on regular day of classes. Participants had 45 min to complete the questionnaire. The data was collected from May to December 2018. Universidad del Desarrollo ethical committee approved our study. Ethical research protocols were met following university guidelines, with an important emphasis on the confidentiality of the information produced, informed consent of the participating schools, the participants themselves and their parents or guardians.

2.3. Data analysis

The nested nature of the data suggested the use of a hierarchical linear model (HLM) to measure subjective well-being. However, the preliminary inspection of subjective well-being measures showed that the variables depart from linearity. Consequently, although both frequentist and Bayesian approaches were applied, only the latter is reported. The advantage of a Bayesian approach in this context is that the estimation does not depend on the linearity assumed by the HLM. The output is distributed with credibility intervals rather than confidence intervals. All models reported in the study used burning periods of 1,000 iterations and sampling steps with 5,000 iterations. Most models converged with Rhats = 1 and a few cases with Rhats = 1.01. On regards of convergence, all Rhat value were less than 1.01 meaning that the chains converge appropriately (Gelman & Rubin, 1992). Finally, missing data were imputed by generating multivariate imputations using chained equations as implemented by Van Buuren and Groothuis Oudshoorn (2011) with the mice package in R.

2.4. Measures

2.4.1. Individual variables

We used self-reported age as a continuous variable, and sex as a dummy.

2.4.2. Student life satisfaction scale

One of the subjective well-being measures we used was a version of Huebner's (1991) Students' Life Satisfaction Scale (SLSS) based on four items that rate students' self-satisfaction with their lives, with the aim of evaluating their lives in a general context-free manner (Casas & Rees, 2014; Huebner, 2004), adapted from Casas and Rees (2014). The instrument has an 11-point Likert scale (0 = strongly disagree, 10 = very much agree), with questions about the level of agreement with statements about satisfaction with life. Examples of items are: "I like my life", "I have what I want in life". Higher scores indicate greater life satisfaction. The Cronbach's alpha of the measure is = 0.89

2.4.3. Brief Multidimensional students' life satisfaction scale

A second measure of subjective well-being is the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS), which explored children's and adolescents' subjective perceptions about various domains of their well-being, namely family, friends, school, and life in general (Seligson, Huebner, & Valois, 2003). This measure is based on five items which use an 11-point Likert scale (0 = strongly unsatisfactory, 10 = strong satisfactory), with questions about how

satisfactory they self-report different domains. Higher scores represent more satisfaction with their lives. Examples of items are: "How satisfied are you with each of the following things in your life: "Your friends?", "Your school experience?". The scale has an internal consistency using Cronbach's alpha = 0.77

2.4.4. Overall life satisfaction scale

The last instrument we used to measure subjective well-being is the Overall Life Satisfaction Scale (OLS). This is a single item measure with the following question: How satisfied (happy or unhappy) are you with your life as a whole? Participants reply based on an 11 Likert scale (0 = not at all satisfied, 10 = completely satisfied). A higher score indicates more positive self-reported life satisfaction.

2.5. Bullying behavior

We used the Illinois Bullying Scale (IBS), which has been used in other studies in Chile (Berger & Caravita, 2016) to measure three forms of bullying behavior (Espelage & Holt, 2001), these being bully, fighting, and victim. *Bully* is based on students' self-reports of aggressive behaviors toward others in school in the previous 30 days, such as teasing, spreading rumors, and excluding other students. It is based on a four-item Likert scale (1 = never; 4 = almost always; $\alpha = 0.90$). Example items are "I upset other students for the fun of it"; "In a group I teased other students". Higher scores indicate more bullying. *Fighting* is a four-item scale (1 = never; 4 = almost always; $\alpha = 0.89$) that measures physical fighting among youths, such as physical aggression in the previous 30 days. Examples of items are "I got in a physical fight"; "I fought students I could easily beat". Higher scores indicate more bullying by the perpetrator of fights. *Victim* is based on a four-point Likert scale with four items to capture self-reports by students that have been victims of aggressive behavior in their school in the previous 30 days (1 = never; 4 = almost always; $\alpha = 0.87$). Example items are: "I got hit and pushed by other students"; "Other students picked on me". Higher scores indicate more self-reports of being a victim of bullying in school.

2.6. School variables

2.6.1. Type of school

We used the type of school as a measure, based on the way schools are funded, and employing a dummy variable (1 = Private school). We constructed this measure according to how schools are funded: public schools are completely funded by government sources, while private schools include schools that receive any amount of private income.

2.6.2. Vulnerability index

We used a measure as a proxy of socioeconomic status of the school, termed the School Vulnerability Index (IVE in Spanish), which has been used by the Chilean Government to measures the levels of students' socioeconomic vulnerability (Junta Nacional de Auxilio Escolar y Becas, JUNAEB, 2005). This index considers information about children and their family and other background information about their communities. Original IVE scores ranged from 0 to 100, with higher scores indicating more vulnerability. However, the distribution of school IVE show a three-mode pattern. Consequently, the variable was recoded into three groups with values 1 for the range 0 to 50, 2 for the range 50 to 80, and 3 for the range 80 to100.

3. Results

Table 1 shows the descriptive statistics for the studied variables. As expected, on average the three subjective well-being measures have higher self-reported values, which is consistent with the literature. Bullying measures have lower mean values, which was also expected based on the results of others studies.

Table 1
Descriptive Statistics.

	%	Mean	SD	Min	Max
Level 1					
Age	–	11.56	1.21	8	16
Female	47.1	–	–	1	2
SLSS	–	8.15	2.17	0	10
BMSLSS	–	8.57	1.64	0	10
OLS	–	8.71	2.19	0	10
Bullying	–	1.50	0.74	1	4
Fighting	–	1.51	0.72	1	4
Victim	–	1.92	0.99	1	4
Level 2					
Type school (=1)*	26.8%	–	–	1	2
IVE	–	2.15	0.80	1	3

* / 1 = Private, 2 = Public

The comparison between the null models, with and without group levels, suggests that hierarchical models are pertinent to estimate SBW measures (for example, SES proxied by type of school gives ICC = 23.1% for SLSS, 18.4% for BMSLSS and 9.5% for OLS). Bullying and fighting subscales did not vary among schools across specifications. We found a negative relationship between victimization and wellbeing estimates at the student level, whether we used the vulnerability proxy or the type of school as a proxy for SES. As shown in Table 2, using the type of school as the grouping factor for SES, the estimates of victims were all negative for the SLSS ($\beta = -0.6$), BMSLSS ($\beta = -0.52$), OLS ($\beta = -0.59$), and all with credibility intervals of 95%, which excludes zero.

Using the vulnerability proxy as the grouping factor for SES (see Tables 3, 4, and 5), the estimates of victim on SLSS, BMSLSS, and OLS were all negative and stable across models with credibility intervals at 95% excluding zero.

At the school level, we found a negative relationship between SES and each subjective well-being measure. Fig. 1 (OLS by SES), Fig. 2 (SLSS by SES) and Fig. 3 (BMSLSS by SES) show the posterior distribution predicted by model 2 in Tables 3, 4 and 5, respectively. Each one based on 8,000 draws per subject. We report three models to show the stability of estimates, for each well-being measures. The first is a slope-only model (Model 1 in Tables 3-5), the second includes first-level predictors (Model 2 in Tables 3-5), and the third add interaction effects between the first and second level variables (Model 3 in Tables 3-5). The estimates remained stable when random slopes are included for victims, with OLS and SLSS models yielding negative correlations between SES and victims, while the BMSLSS model yielded positive correlations. However, none of the credibility intervals allowed us to exclude zero for those models. Lastly, Table 6 replicates the analysis based on two age groups. The results do not show a significant difference between the two groups.

4. Discussion

Our results highlight the negative effects of bullying on adolescent well-being based on different measures that provide important insights for prevention programs. We also found that SES is related to well-being at the school level, which evidences the relevance of other features to be considered for prevention programs. This provides evidence in the Chilean context of the negative effects of risk levels and inequity on subjective adolescent well-being.

Based on different measures, being a victim of bullying was associated with fewer reports of adolescent well-being, which is consistent with the findings of other studies (Varela et al., 2018, 2019). If we consider bullying as a permanent form of aggressive behavior against other students, we can expect it to have a negative effect in other adolescent domains. Moreover, different *meta*-analyses have shown the negative effects of bullying based on comparisons of bullied and not

Table 2
Hierarchical Models of Subjective Well-being, SES (proxied by type of school).

	OLS			
	Estimate	Cred. Interval	Estimate	Cred. Interval
Group-Level Effects:				
sd(Intercept)	0.56	[0.01 : 2.81]	4.08	[0.08 : 17.38]
sd(age)			0.91	[0.01 : 5.26]
sd(gender)			2.54	[0.03 : 13.14]
cor(Intercept,age)			−0.07	[-0.93 : 0.89]
cor(Intercept,gender)			−0.02	[-0.9 : 0.9]
cor(age,gender)			−0.03	[-0.92 : 0.91]
Population-Level Effects:				
Intercept	8.7	[8.13 : 9.27]	13.79	[5.63 : 21.69]
Age			−0.25	[-1.23 : 1.03]
Gender			−0.34	[-5.02 : 4.8]
Bullying			0.02	[-0.27 : 0.3]
Fighting			0.14	[-0.11 : 0.39]
victim			−0.59	[-0.73 : −0.45]
Family Specific Parameters:				
sigma	2.19	[2.12 : 2.26]	2.06	[1.99 : 2.13]
ICC	0.061373			
	SLSS			
	Estimate	Cred. Interval	Estimate	Cred. Interval
Group-Level Effects:				
sd(Intercept)	2.35	[0.04 : 8]	4.01	[0.07 : 17.18]
sd(age)			0.75	[0.01 : 3.94]
sd(gender)			2.43	[0.03 : 12.28]
cor(Intercept,age)			−0.08	[-0.93 : 0.88]
cor(Intercept,gender)			−0.01	[-0.92 : 0.9]
cor(age,gender)			−0.03	[-0.93 : 0.9]
Population-Level Effects:				
Intercept	8.11	[6.46 : 9.79]	13.41	[6.41 : 20.46]
age			−0.26	[-1.22 : 0.74]
gender			−0.46	[-5.12 : 3.93]
Bullying			0.03	[-0.27 : 0.33]
Fighting			−0.14	[-0.4 : 0.11]
victim			−0.6	[-0.74 : −0.45]
Family Specific Parameters:				
sigma	2.26	[2.19 : 2.32]	2.1	[2.03 : 2.17]
ICC	0.51952			
	BMSLSS			
	Estimate	Cred. Interval	Estimate	Cred. Interval
Group-Level Effects:				
sd(Intercept)	0.5	[0.02 : 1.74]	4.14	[0.09 : 16.49]
sd(age)			0.94	[0.01 : 5.18]
sd(gender)			2.4	[0.02 : 13.14]
cor(Intercept,age)			−0.08	[-0.94 : 0.87]
cor(Intercept,gender)			−0.02	[-0.9 : 0.9]
cor(age,gender)			−0.01	[-0.91 : 0.9]
Population-Level Effects:	8.56	[7.91 : 9.42]	13.08	[5.71 : 20.51]
Intercept				
age			−0.24	[-1.37 : 1.05]
gender			−0.4	[-5.35 : 4.18]
Bullying			0	[-0.22 : 0.21]
Fighting			0.04	[-0.15 : 0.22]
victim			−0.52	[-0.63 : −0.42]
Family Specific Parameters:				
sigma	1.64	[1.64 : 1.69]	1.54	[1.48 : 1.59]
ICC	0.085045584			

Note. E = Estimate; C.I. = Cred. Interval
Sigma: Residual Variance on the population level (pupil level).
ICC = (Posterior mean of the residual variance)^2 / [(Posterior mean of the residual variance)^2 + sigma^2] = sd(Intercept)^2/[sd(Intercept)^2 + Sigma^2].

bullied children (Gini et al., 2019; Wolke & Lereya, 2015), and even establishing a direct negative causal link to well-being (Schoeler, Duncan, Cecil, Ploubidis, & Pingault, 2018), which highlights the importance of prevention programs in schools.

Conversely, bullying and fighting did not have an effect on student well-being, indicating a different dynamic for bullying. Previous studies have provided less evidence of these relationships with adolescent well-being, and have instead found more long-term negative effects on students that play the role of victims or perpetrators, highlighting more complex dynamics for bullying (Flaspohler, Elfstrom, Vanderzee, Sink, & Birchmeier, 2009; Wolke, Copeland, Angold, & Costello, 2013). O'Brennan, Bradshaw, and Sawyer (2009) described the differences in socioemotional development trajectories for victims, bullies and bullies/victims, and pointed out that bullies present less internalizing symptoms than do victims. This could be related to the effect of more self-reporting on measures of well-being by victims than by bullies, since they could be more sensitive to report the impact of bullying on their perceived quality of life.

In the current study, we explored the negative effects of low SES on adolescent SWB, including bullying. This is important considering the

Table 3
Hierarchical models of OLS, SES (proxied by the vulnerability index).

		Model 1		Model 2		Model 3	
		Estimate	Cred. Interval	Estimate	Cred. Interval	Estimate	Cred. Interval
Group-Level Effects:	sd(Intercept)	0,77	[0,16 : 2,91]	0,78	[0,02 : 3,12]	0,84	[0,02 : 3,2]
	sd(age)			0,10	[0,00 : 0,50]	0,13	[0 : 0,62]
	sd(gender)			0,49	[0,02 : 2,11]	0,51	[0,02 : 2,15]
	sd(victim)					0,42	[0,01 : 1,87]
	cor(Intercept, age)		−0,14	[-0,93 : 0,85]	−0,09	[-0,87 : 0,79]	
	cor(Intercept, gender)		−0,09	[-0,92 : 0,87]	−0,05	[-0,85 : 0,8]	
	cor(age, gender)		−0,01	[-0,90 : 0,89]	0,01	[-0,82 : 0,83]	
	cor(Intercept,victim)			**−0,03**	**[-0,84 : 0,81]**		
	cor(age,victim)				−0,12	[-0,88 : 0,77]	
	cor(gender,victim)				−0,05	[-0,85 : 0,8]	
Population-Level Effects:	Intercept	8,79	[7,79 : 9,94]	13,64	[12,16 : 15,22]	13,68	[12,14 : 15,32]
	age			−0,29	[-0,44 : −0,11]	−0,29	[-0,45 : −0,07]
	gender			−0,39	[-1,09 : 0,47]	−0,38	[-1,12 : 0,52]
	bully			0,11	[-0,15 : 0,37]	0,1	[-0,16 : 0,36]
	fight			0,20	[-0,04 : 0,43]	0,19	[-0,04 : 0,43]
	victim			**−0,63**	**[-0,77 : −0,5]**	**−0,64**	**[-1,26 : 0,11]**
Family Specific Parameters:	sigma	2,19	[2,12 : 2,26]	2,10	[2.03 : 2.17]	2,10	[2,03 : 2,17]
	ICC	0,11		0,12		0,14	

Note. E = Estimate; C.I. = Cred. Interval
Sigma: Residual Variance on the population level (pupil level).
ICC = (Posterior mean of the residual variance)^2 / [(Posterior mean of the residual variance)^2 + sigma^2] = sd(Intercept)^2/[sd(Intercept)^2 + Sigma^2].

significant level of socioeconomic inequality in Chile. Available evidence shows that Chile has the highest Gini coefficient among Organization for Economic Co-operation and Development member states (OECD, 2019). Thus, we examined if bullying has more negative consequences on SWB among more socially vulnerable adolescents. We explored this relationship based on previous studies that linked SES with victims and bullying (Tippett & Wolke, 2014). However, we did not find a different effect on SWB while considering the levels of school-related vulnerability. Our study nevertheless contributes to the literature by examining SES at the school level using hierarchical methods to account for the degree to which variance is shared between schools and contexts. Cummins (2000) and Main (2014) have noted that there is no significant linear association between income and poverty, and that SWB does not necessarily mean a lack of association between them. Indeed, these authors suggest that there are other factors associated with poverty and that factors other than low income affect SWB.

Although we found an effect of SES on adolescent SWB, we still do not know the underlying mechanisms of this relationship. This is important because we can recognize possible mediators of this relationship, such as community, family and other school variables. As described above, international comparisons have focused on inequality, Gross Domestic Product (GDP), and access to material resources (Chzhen et al., 2016; Levin et al., 2011; Sarriera et al., 2014). For example, Chzhen, Moor, Pickett, Toczydlowska, and Stevens (2016) studied the relationship between the socioeconomic context of adolescents and low self-reports on health and well-being in 32 European and North American countries, analyzing four cycles of the Health Behavior in School-aged Children Study, 2002–2014. The study showed that adolescents from less economically favored countries are more likely to exhibit lower life satisfaction indicators than their counterparts in wealthier countries. However, other underlying variables that also explain this effect are important to improve our understanding of

Table 4
Hierarchical models of SLSS, SES (proxied by the vulnerability index).

		Model 1		Model 2		Model 3	
		Estimate	Cred. Interval	Estimate	Cred. Interval	Estimate	Cred. Interval
Group-Level Effects:	sd(Intercept)	1,07	[0.29 : 3.34]	0,86	[0,02 : 3,21]	0,92	[0,03 : 3,42]
	sd(age)			0,13	[0 : 0,59]	0,15	[0 : 0,67]
	sd(gender)			0,53	[0,02 : 2,23]	0,46	[0,01 : 2,02]
	sd(victim)					0,28	[0,01 : 1,39]
	cor(Intercept, age)		−0,15	[-0,94 : 0,83]	−0,13	[-0,88 : 0,76]	
	cor(Intercept, gender)		−0,07	[-0,91 : 0,87]	−0,05	[-0,85 : 0,81]	
	cor(age, gender)		0,04	[-0,87 : 0,91]	0,04	[-0,81 : 0,85]	
	cor(Intercept,victim)				**−0,03**	**[-0,85 : 0,81]**	
	cor(age,victim)				−0,07	[-0,86 : 0,81]	
	cor(gender,victim)				−0,02	[-0,83 : 0,83]	
Population-Level Effects:	Intercept	8,26	[7.01 : 9.68]	12.72	[11,09 : 14,33]	12,69	[11,03 : 14,4]
	age			−0.23	[-0,4 : −0,02]	−0,24	[-0,43 : −0,01]
	gender			−0.45	[-1,22 : 0,46]	−0,44	[-1,11 : 0,37]
	bully			−0.02	[-0,33 : 0,28]	0,02	[-0,24 : 0,29]
	fight			0.06	[-0,19 : 0,32]	0	[-0,23 : 0,23]
	victim			**−0.58**	**[-0,72 : −0,44]**	**−0,52**	**[-1,02 : −0,07]**
Family Specific Parameters:	sigma	2,23	[2.16 : 2.31]	2,15	[2.08 : 2.22]	2,15	[2,09 : 2,22]
	ICC	0,19		0,14		0,15	

Note. E = Estimate; C.I. = Cred. Interval
Sigma: Residual Variance on the population level (pupil level).
ICC = (Posterior mean of the residual variance)^2 / [(Posterior mean of the residual variance)^2 + sigma^2] = sd(Intercept)^2/[sd(Intercept)^2 + Sigma^2].

Table 5
Hierarchical models of BMSLSS. SES (proxied by the vulnerability index).

		Model 1		Model 2		Model 3	
		Estimate	Cred. Interval	Estimate	Cred. Interval	Estimate	Cred. Interval
Group-Level Effects:	sd(Intercept)	0,8	[0,21–2,67]	0,7	[0,02 : 2,84]	0,75	[0,03 : 2,92]
	sd(age)			0,1	[0 : 0,44]	0,13	[0,01 : 0,62]
	sd(gender)			0,31	[0,01 : 1,48]	0,33	[0,01 : 1,65]
	sd(victim)					0,36	[0,01 : 1,8]
	cor(Intercept,age)			−0,12	[-0,94 : 0,85]	−0,08	[-0,86 : 0,79]
	cor(Intercept,gender)			−0,04	[-0,91 : 0,88]	−0,03	[-0,84 : 0,83]
	cor(age,gender)			−0,02	[-0,9 : 0,88]	−0,02	[-0,85 : 0,82]
	cor(Intercept,victim)					**−0,03**	**[-0,83 : 0,82]**
	cor(age,victim)					−0,14	[-0,89 : 0,75]
	cor(gender,victim)					0,02	[-0,82 : 0,83]
Population-Level Effects:	Intercept	8,64	[7,56–9,87]	12,44	[11,19 : 13,71]	12,46	[11,17 : 13,8]
	age			−0,22	[-0,36 : −0,05]	−0,22	[-0,39 : −0,02]
	gender			−0,26	[-0,78 : 0,3]	−0,26	[-0,85 : 0,34]
	bully			0,04	[-0,15 : 0,23]	0,04	[-0,15 : 0,23]
	fight			0,11	[-0,06 : 0,28]	0,1	[-0,06 : 0,27]
	victim			**−0,53**	**[-0,63 : −0,44]**	**−0,53**	**[-1,06 : 0,13]**
Family Specific Parameters:	sigma	1,62	[1,57–1,68]	1,54	[1,49 : 1,59]	1,54	[1,49 : 1,59]
	ICC	0,20		0,17		0,19	

Note. E = Estimate; C.I. = Cred. Interval
Sigma: Residual Variance on the population level (pupil level).
ICC = (Posterior mean of the residual variance)^2 / [(Posterior mean of the residual variance)^2 + sigma^2] = sd(Intercept)^2/[sd(Intercept)^2 + Sigma^2].

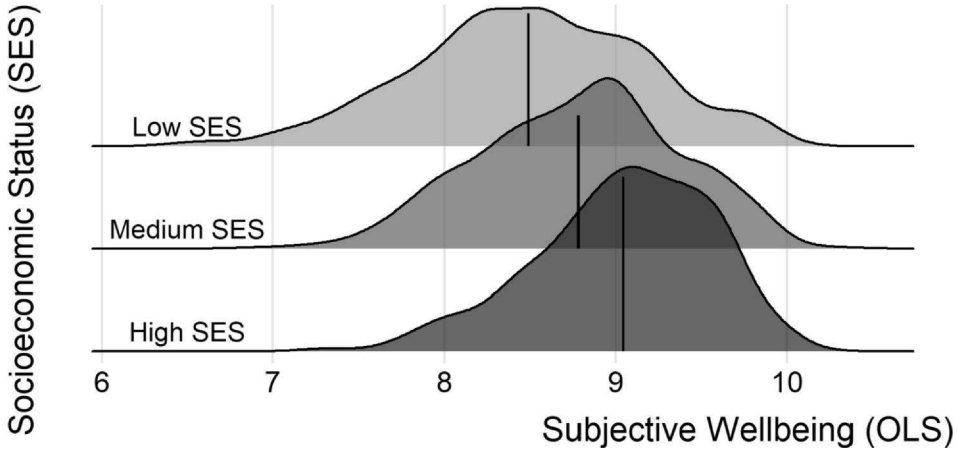

Fig. 1. Posterior predicted OLS by SES. Graphs shows the distribution of predicted samples of OLS by SES based on 8000 draws of the posterior probabilities based on model 2 in table 3. The vertical lines represent the mean value per socioeconomic status: 9.04 (High SES), 8.79 (Medium SES), and 8.49 (Low SES).

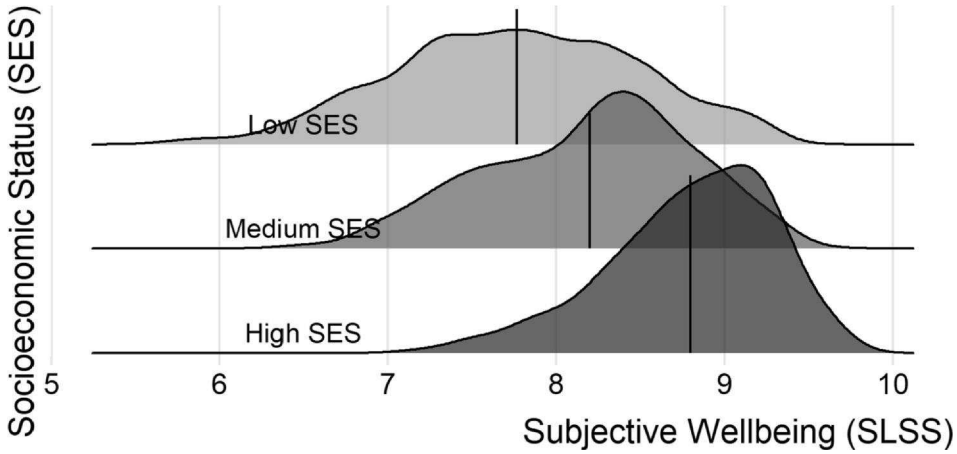

Fig. 2. Posterior predicted SLSS by SES. Graph shows the distribution of predicted samples of SLSS by SES based on 8000 draws of the posterior probabilities based on model 2 in table 3. The vertical lines represent the mean value per socioeconomic status: 8.79 (High SES), 8.20 (Medium SES), and 7.77 (Low SES).

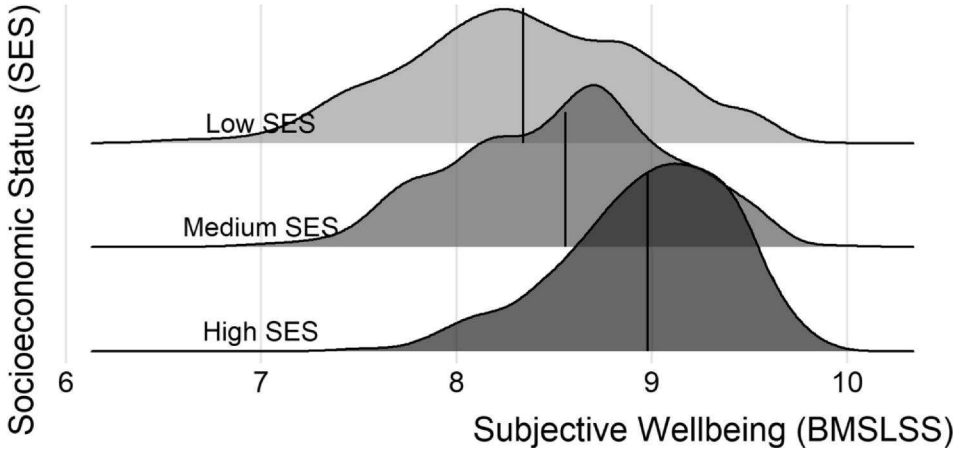

Fig. 3. Posterior predicted BMSLSS by SES. Graph shows the distribution of predicted samples of BMSLSS by SES based on 8000 draws of the posterior probabilities based on model 2 in table 3. The vertical lines represent the mean value per socioeconomic status: 8.98 (High SES), 8.56 (Medium SES), and 8.34 (Low SES).

Table 6
Hierarchical models of OLS, SLSS and BMSLSS with pupils divided by their developmental level, SES (proxied by Vulnerability Index).

		Model 1		Model 2		Model 3	
		Estimate	Cred, Interval	Estimate	Cred, Interval	Estimate	Cred, Interval
Group-Level Effects:	sd(Intercept)	0,77	[0,03 : 2,4]	0,68	[0,22 : 2,11]	0,76	[0,2 : 2,34]
	sd(victim)	0,57	[0,04 : 2,07]	0,13	[0,01 : 0,5]	0,22	[0,02 : 0,83]
	cor(Intercept,victim)	−0,24	[-0,98 : 0,9]	−0,28	[-0,98 : 0,82]	−0,67	[-1 : 0,23]
	Intercept	−8277,03	[-36026,14 : 35105,03]	−6190,8	[-25293,57 : 21521,5]	−2679,96	[-28817,99 : 14556,68]
	children	8287,85	[-35093,06 : 36036,48]	6201,26	[-21511,35 : 25304,02]	2690,33	[-14546,74 : 28828,76]
	adolescent	8287,16	[-35093,69 : 36035,75]	6200,7	[-21511,88 : 25303,65]	2689,77	[-14547,32 : 28828,36]
	gender	−0,37	[-0,58 : −0,18]	−0,45	[-0,69 : −0,25]	−0,32	[-0,48 : −0,16]
	bully	0,02	[-0,24 : 0,26]	−0,02	[-0,32 : 0,31]	0,03	[-0,18 : 0,21]
	fight	0,14	[-0,08 : 0,37]	−0,06	[-0,32 : 0,27]	0	[-0,22 : 0,21]
	victim	−0,62	[-1,35 : 0,14]	−0,55	[-0,73 : −0,32]	−0,53	[-0,79 : −0,25]
Population-Level Effects:	sigma	2,06	[1,99 : 2,13]	2,08	[2,01 : 2,16]	1,53	[1,49 : 1,59]
	ICC	0,12		0,10		0,10	

Note. E = Estimate; C.I. = Cred. Interval

significant predictors of adolescent SWB.

Despite the importance of the aforementioned results, our study has limitations worth noting. Firstly, we collected data using a random sample from the two largest cities in Chile, but did not sample rural areas. This could be relevant for future studies considering economic differences between rural and urban contexts for adolescents. Secondly, our analysis only considered data at one point in time, highlighting the need to examine longitudinal samples based on different types of analysis in the future. Thirdly, we only examined face-to-face bullying, and did not consider other forms of aggression like cyberbullying. Future studies should apply a similar analysis to cyberbullying among adolescents, as well as to other types of bullying. Lastly, we used quantitative data to explore adolescent subjective well-being, without considering qualitative approaches. Future studies could include mixed designs to capture other possible variables that also explain well-being. Despite previous limitations, our study adds to the literature by examining bullying using different measures of well-being while considering socioeconomic status at the school level using hierarchical methods.

CRediT authorship contribution statement

Jorge J. Varela: Conceptualization, Formal analysis, Investigation, Methodology, Writing - original draft. **Jorge Fábrega:** Formal analysis, Methodology, Software. **Gisela Carrillo:** Conceptualization, Writing - original draft. **Mariavictoria Benavente:** Data curation, Investigation, Writing - original draft. **Jaime Alfaro:** Conceptualization, Funding acquisition. **Carlos Rodríguez:** Conceptualization, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2020.105398.

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