RESEARCH ARTICLE

Family socioeconomic status and provincial-level economic, educational, and health-related factors as predictors of present- and future-oriented subjective wellbeing in junior high school students in China

Xiaojing Wu[1] | Xiaosong Gai[1] | Lili Xu[1] | Fangqing Liu[1] | Hong Wang[1] | Hongyang Kou[2]

[1]School of Psychology, Northeast Normal University, Changchun, Jilin, China

[2]Northeast Asian Studies College, Jilin University, Changchun, Jilin, China

Correspondence
Xiaosong Gai, School of Psychology, Northeast Normal University, 5268 Renmin St., Changchun, 130024 Jilin, China.
Email: gaixs669@nenu.edu.cn

Abstract

Introduction: Previous studies have examined family socioeconomic status (SES) and regional-level factors that predict adolescents' present subjective wellbeing (SWB). However, as adolescents' SWB tends to be future-oriented, this study examined the relationships between family SES and provincial-level economic, educational, and health-related factors and adolescents' present- and future-oriented SWB.

Methods: The sample includes 17,341 12- to 17-year-old adolescents (M_{age} = 13.86; SD_{age} = 0.79; 9056 girls and 8285 boys) from 31 different provinces of China. Multilevel modeling was used to analyze the data at two levels.

Results: The findings showed that family SES (Level-1) was positively correlated with present life satisfaction (LS-P), present positive affect (PPA), hopeful future expectations (HFE), and positive affect toward future life (FPA), but negatively correlated with present negative affect (PNA) and negative affect toward future life (FNA). Provincial-level (Level-2) years of education per capita, average life expectancy, and human development index (HDI) were positively associated with LS-P, PPA, FPA, and HFE, and negatively associated with PNA; only average life expectancy was negatively associated with FNA. There was no association between gross domestic product (GDP) per capita and SWB. Simple slope analyses demonstrated that, in provinces with relatively less or short years of education per capita, GDP per capita, average life expectancy, or HDI, the correlations between family SES and present- and future-oriented negative affect were stronger.

Conclusions: The present- and future-oriented SWB of adolescents from families with low SES in underdeveloped areas was relatively poor. More psychologically focused education activities are needed for these adolescents.

KEYWORDS
adolescents, future, provincial-level, socioeconomic status, subjective wellbeing

1 | INTRODUCTION

Subjective wellbeing (SWB) is important for adolescent development. Studies have mainly adopted a traditional SWB model to study adolescents' SWB, including present-oriented life satisfaction, positive affect, and negative affect (Diener, 1984). The engine model of wellbeing proposes that SWB may contribute to positive outcomes (Jayawickreme et al., 2012). Indeed, previous research demonstrated that present-oriented life satisfaction positively predicts adolescents' academic performance (Datu & King, 2018; Ng et al., 2015). Positive affect toward present life is positively associated with self-regulated learning

(Mega et al., 2014), while negative affect toward present life negatively predicts adolescents' academic engagement (Datu & King, 2018).

However, previous studies suggest that adolescents' SWB is more future-oriented than adults' SWB (Carstensen et al., 1999; Ryff & Keyes, 1995; Valle et al., 2006). Considering the future-oriented nature of adolescents' SWB, Wang et al. (2018) proposed the Adolescents' SWB Model, which comprises both present- and future-oriented SWB. The future-oriented SWB incorporates hopeful future expectations (HFE), positive affect toward future life (FPA), and negative affect toward future life (FNA). Studies have demonstrated that, compared to their counterparts, adolescents with more positive expectations for the future are more willing to contribute to society (Callina et al., 2014) and display fewer risky behaviors (Prince et al., 2019). Wu et al. (2020) found that positive affect toward future life positively predicts academic achievement, 14 months later. As previous studies suggest that both present- and future-oriented SWB could contribute to adolescents' development, it is necessary to determine which environmental factors predict adolescents' present- and future-oriented SWB.

According to ecological systems theory, both the exosystem and the macrosystem affect an individual's development (Bronfenbrenner, 1989). The exosystem refers to contexts in which individuals are not directly involved but which affect an individual's development. The macrosystem refers to the broadest and most wide-ranging contexts (such as ethnicity and social culture), which also affect individual development. China has the largest population worldwide, and its provinces have different development levels in many aspects, such as economic and educational. Although exosystems and macrosystems are difficult to change in the short term, it is important to examine how these factors are associated with Chinese adolescents' SWB, as understanding this association is likely to help identify adolescents who may be at risk for lower SWB due to factors that are beyond their control and provide guidance on improving aspects of the macrosystem in a region.

Family socioeconomic status (SES), as an exosystem component, is positively related to adolescents' present life satisfaction (LS-P) (e.g., W. Chen et al., 2016; Levin et al., 2011). Similarly, adolescents with higher family SES are more likely to have higher positive expectations of the future (Dixson et al., 2018; M. K. Johnson & Hitlin, 2017; Nurmi, 1991). The family investment model proposes that SES translates into adolescents' wellbeing through material investments and interpersonal investments (Schofield et al., 2011 ; Sohr-Preston et al., 2013). Research indicates that parents with high SES, such as high education level and occupational status, tend to provide abundant family resources (i.e., social, cultural, and financial capital) (Huang et al., 2015) and improved quality of parental time with children (e.g., parental school- and home-based involvement) (X. Li et al., 2020; Zhang et al., 2021), which, in turn, has a positive effect on adolescents' SWB (Ge, 2020; Yap & Baharudin, 2016). In addition, the family stress model proposes that economic pressure on families could lead to parental psychological distress, deterioration of the quality of parents' relationship, and disrupted parenting, which are likely to negatively affect adolescents' mental health (Masarik & Conger, 2017). In the face of a disadvantaged family situation, adolescents with low SES would be likely to feel pessimistic about their future life (Kraus et al., 2012) in accordance with the constructive episodic simulation hypothesis in which people simulate their future life based on their past experiences (Schacter & Addis, 2007); therefore, low family SES may damage adolescents' present- and future-oriented SWB.

Regional-level factors, as macrosystem components, may predict SWB. Livability theory proposes that a subjective appreciation of life depends on the objective quality of that life; that is, the better the living conditions in a region, the happier its inhabitants (Veenhoven & Ehrhardt, 1995). Many factors contribute to the quality of life, such as economic prosperity, health, and educational opportunities (Okulicz-Kozaryn & Valente, 2019). More specifically, studies have found regional differences in present-oriented SWB among children and adolescents from different countries (e.g., Main et al., 2019; Newland et al., 2019), indicating that regional factors contribute in varying ways to adolescents' SWB.

The effect of regional economic factors on adolescents' SWB has been extensively examined among regional-level factors, but the results are inconsistent. Studies have found that regional gross domestic product (GDP) per capita, one indicator of a region's income and economic growth, is positively related to the averaged life satisfaction of children and adolescents in a region (Bradshaw & Richardson, 2009; Levin et al., 2011), which is consistent with the results of studies among adult samples (Deaton, 2008; Diener et al., 1995). Ravens-Sieberer et al. (2013) found that children from European countries with higher GDP per capita were at lower risk for low SWB. However, other studies have found that GDP per capita contributes little to children's and adolescents' present-oriented SWB (Cho, 2019; Klocke et al., 2014; Lee & Yoo, 2015; Main et al., 2019; Newland et al., 2019). Several explanations are possible for these findings concerning the nonsignificant effect of GDP per capita on adolescents' SWB. First, there are studies that show that economic growth might increase work pressure (Lopes et al., 2014), which, in turn, might lead to more parental role overload and parent-adolescent conflict and damage adolescents' SWB (Crouter et al., 1999). Second, economic development has been found to be positively associated with divorce (e.g., Kunzel, 1974; Mo, 2020) and single parenthood (Barber, 2003), which, in turn, decreases the time available to be spent with children as single parents and parents in reconstituted families spent less time on developmental and nondevelopmental activities concerning their children (Fallesen & Gähler, 2020). Therefore, economic development might have a negative effect on adolescents' SWB through decreasing parental involvement and offsetting the positive effects of economic development on adolescents' SWB. Nonetheless, it is unclear whether regional-level GDP per capita is associated with adolescents' future-oriented SWB. Considering the weak relationship between GDP per capita and adolescents' present-oriented SWB, we predicted a weak or nonexistent significant link between GDP per capita and adolescents' present- and future-oriented SWB.

Previous studies have examined the effects of regional education- and health-related factors in explaining adolescents' present-oriented SWB. However, *education expenditure as a percentage of GDP* (Cho, 2019; Lee & Yoo, 2015) has not been found to be significantly related to adolescents' present-oriented SWB, nor has *health expenditure as a percentage of GDP* (Cho, 2019) or *child mortality rates under 5-years-old* (Lee & Yoo, 2015). This may be because these indicators do not directly reflect the health care and educational levels of a region. In this study, we examined the effects of per capita years of education and average life expectancy in explaining adolescents' present- and future-oriented SWB. Per capita years of education is suggested to be the best indicator of educational attainment in a region (Psacharopoulos & Arriagada, 1986). Increased availability of and access to education could reduce cultural and ethnic disparities that weaken social cohesion (Devkota & Upadhyay, 2016), positively influencing adolescents' social environments. In addition, fewer per capita years of education may increase high test anxiety, which hinders students' SWB (Steinmayr et al., 2016), as fewer students were expected to accept higher level of education. Therefore, per capita years of education was expected to positively predict adolescents' present- and future-oriented SWB. Average life expectancy reflects people's health status in a region (Deaton, 2008). According to terror management theory, people may have death anxiety caused by their consciousness of "mortality" (Rosenblatt et al., 1989). Short average life expectancy may trigger more death anxiety (Handal, 1969), which would lower SWB (Aghababaei et al., 2016; Feng et al., 2021). Therefore, we speculated that if the average life expectancy of the population in a province was low, it may negatively predict adolescents' present- and future-oriented SWB.

The human development index (HDI) is used to reflect a region's overall development level (United Nations Development Programme, 2010). The HDI comprises three domains: health (life expectancy at birth), education (expected years of education at birth and mean years of schooling for adults), and economic (gross national income per capita in purchasing power parity). Therefore, compared with specific development indicators, the HDI is more representative of a region's development level or social progress. As HDI scores have been found to be highly related to the SWB of people above the age of 15 (Chaaban et al., 2016), we speculated that the HDI would positively predict adolescents' present- and future-oriented SWB.

Additionally, macrosystem factors may moderate the relationship between family SES and adolescents' SWB. A meta-analysis found that the relationship between SES and present-oriented SWB in developing countries was stronger among low-income developing economies than among high-income developing economies (Howell & Howell, 2008). Levin et al. (2011) found that higher SES had less effect on children's LS-P in high-income compared with low-income countries. The need theory proposes that economic and material factors have their strongest influence on SWB when they can satisfy basic physiological needs (Diener & Biswas-Diener, 2002; Veenhoven, 1991). Further, when people's physiological needs are being satisfied, the effect of SES on SWB diminishes (Kraus, 2018), because higher-order needs (e.g., belonging, love, esteem, self-actualization) are nonmaterial in general (Arthaud-day & Near, 2005; Lever et al., 2005). Physiological needs are more likely to be met in relatively high-income regions where more resources are available than in relatively low-income regions. Therefore, the link between SES and SWB can be expected to be smaller in more developed regions than in less developed regions (Kraus, 2018). In accordance with the need theory and previous studies, we examined whether regional factors could moderate the relationship between family SES and adolescents' present- and future-oriented SWB.

In summary, this study focused on four types of provincial-level factors, namely, GDP per capita, per capita years of education, average life expectancy, and the HDI (Table 1 shows the definitions and sources of the regional-level variables), to address the following research questions:

TABLE 1 Definitions and sources of provincial-level variables

Variable	Definition	Source	Year
GDP per capita	GDP per capita refers to the ratio of the absolute value of the gross domestic product to the average population in that year. It is an indicator of a region's income and economic growth.	National Bureau of Statistics of China	2018
Per capita years of education	Per capita years of education refers to the average of the total number of years of academic education for people aged 6 and above, which is a weighted average of the proportion of people with different educational levels in the total population. It is an indicator that reflects educational development achievement of a region.	The research report of Y. T. Chen and Lei (2019)	2017
Average life expectancy	Average life expectancy is the number of years a person can expect to live after birth. It is a comprehensive index reflecting the level of human health.	National Bureau of Statistics of China	2010
Human development index	Human development index comprises three domains: health (life expectancy at birth), education (expected years of education at birth and mean years of schooling for adults), and income (gross national income per capita in purchasing power parity). The three domains are attributed equal importance in the overall index. It is a composite indicator of societal progress.	The research report of C. J. Liu et al. (2020)	2017

1. What is the relationship between family SES and adolescents' present- and future-oriented SWB?
2. What is the relationship between provincial-level factors and adolescents' present- and future-oriented SWB?
3. Compared to more developed regions, were the correlations between family SES and present- and future-oriented SWB stronger in less developed regions?

On the basis of previous studies and theories, family SES and provincial-level factors were expected to be positively or not related to LS-P, present positive affect (PPA), HFE, and FPA, and negatively or not related to present negative affect (PNA) and FNA. Compared to more developed regions, the correlations between family SES and present- and future-oriented SWB were expected to be stronger in less developed regions.

2 | METHOD

2.1 | Participants

This study used a cross-sectional design to collect data from junior high school students in 31 different provinces of China. We recruited from schools willing to participate and provide volunteers in this study through posting notifications on WeChat moments. We excluded 128 students from the analysis because of missing data on age, gender, or SES. Therefore, the final sample consisted of 17,341 students (9056 girls and 8285 boys; mean $[M]_{age}$ = 13.86; standard deviation [SD] = 0.79). Each province's average sample size was 559.39 (SD = 924.44; range = 58–4416). The median sample size was 249. Detailed information on the participant distribution is provided in Table S1.

2.2 | Measures

2.2.1 | Subjective wellbeing

The Adolescent Well-being Scale (AWBS) (Wang et al., 2018; Wang, 2015) was used in this study, which is a 59-item self-report scale. The AWBS has six dimensions, including LS-P (21 items), PPA (7 items), PNA (7 items), HFE (10 items), FPA (8 items), and FNA (6 items). In this study, LS-P α's ranged from .83 to .94, PPA α's ranged from .78 to .92, PNA α's ranged from .71 to .88, HFE α's ranged from .84 to .94, FPA α's ranged from .85 to .94, and FNA α's ranged from .75 to .87. Participants rated each item on a 5-point Likert scale ranging from 1 = *does not correspond at all* to 5 = *corresponds exactly*. We assessed the metric invariance and scalar invariance for the six dimensions across 31 provinces, detail information was shown in Table S2.

2.2.2 | Family SES

Family SES was quantified as a combination of parental education and parental occupational status (H. B. Chen & Liu, 2018; Qiao et al., 2013; Zhang et al., 2020). Parental education was divided into six levels, ranging from primary schools and below = 1, to master's degree or above = 6. Referring to Zhang et al. (2020) in measuring parents' occupations, parental occupational status was divided into five levels, ranging from 1 = unemployed or temporary workers, to 5 = senior managers and senior professional and technical personnel. Students rated their parents' educational and occupational statuses, and the scores were standardized and summed to form a single index of SES (Zhang et al., 2020). Young and Hannum (2018) found that directly asking families to report their income resulted in high levels of missing or biased data. In addition, Davis-Kean (2005) found that parental income was highly related to parental education levels. Therefore, we did not include income in this study.

2.2.3 | Provincial-level factors

This study employed four provincial-level variables, including GDP per capita, per capita years of education, average life expectancy, and HDI. Table 1 shows the definitions and sources of the provincial-level variables.

2.2.4 | Controlling variables

In terms of age and gender, the participants reported on their birth date and whether they were male (0) or female (1). As studies have found that age is negatively related to life satisfaction from childhood to adolescence (Main et al., 2019; Newland et al., 2019) and that boys' SWB is significantly higher than that of girls (Michel et al., 2009; Newland et al., 2019), we included age and gender as controlling variables in the multilevel analysis.

Demographics and means concerning SWB for each of the 31 provinces are illustrated in Table S1.

2.3 | Procedures

Data were collected through administering the questionnaires in schools or online between April and June 2019. Informed consent was obtained from school administrators, teachers, students, and parents before data collection. Students were told that their participation was completely voluntary and confidential. The study was approved by the institution's internal review board.

2.4 | Model building approach

The missingness of the six dimensions of SWB was relatively low. Multiple imputation techniques were used to impute the missing data to mitigate the potential of bias in parameter estimates due to missing data. The detailed descriptions of the missing data analyses are presented in the Supporting Information.

As both the data (students nested within each province) and the research questions were multilevel, multilevel modeling (MLM) analyses were performed using the linear mixed modeling procedure in SPSS 21.0 (Nezlek, 2008). Provincial-level variables were grand mean-centered, and age and family SES were group mean-centered. We examined the six dimensions of SWB separately, which would help us understand the effects of regional factors on different aspects of SWB (Keyes, 2005).

Following the method adopted by L. K. Johnson (2020) in using MLM to examine the predictive roles of two-level factors, five steps were used to answer the research questions in this study. First, a null model (Model 1 in Tables S3–S8) was developed to calculate the intraclass correlation coefficient (ICC), an index of the proportion of between-province variation in the six dimensions of SWB. Second, we examined the relationships between family SES and the six dimensions of SWB, with gender and age as the control variables, using random intercept multilevel models (see Model 2 in Tables S3–S8). Third, based on step 2, random slope multilevel models (Model 3 in Tables S3–S8) were used to examine whether the relationships between family SES and the six dimensions of SWB differed across the 31 provinces. Fourth, after adjusting for Level-1 factors (student), we added provincial-level factors to examine the relationships between the Level-2 factors and the six dimensions of SWB. As the selected provincial-level factors may correlate with each other, we avoided the problem of multicollinearity by building four separate models (Models 4, 6, 8, and 10 in Tables S3–S8) to examine the relationships. Fifth, the Level-2 predictors of slope (i.e., the slope of SES regressed on provincial-level factors) were added to the model (Models 5, 7, 9, and 11 in Tables S3–S8). If the cross-level interaction (Υ_{02}, Υ_{04}, Υ_{06}, or Υ_{08}) was significant, this meant that the SES-SWB slope differed significantly at different levels of a provincial factor.

3 | RESULTS

3.1 | The unconditional model (null model) for SWB

We built six null models (Model 1 in Tables S3–S8) to examine how much variation in the six dimensions of SWB was attributable to adolescent- and provincial-level factors.

$$\text{Level 1 (student): } \Upsilon_{ij} = \beta_{0j} + r_{ij},$$
$$\text{Level 2 (province): } \beta_{0j} = \gamma_{00} + u_{0j}.$$

The score on the six dimensions of SWB of student i in province j (Υ_{ij}) was modeled as a function of the mean score of each dimension for province j (β_{0j}) and a residual term signaling individual differences around the mean of the province j (r_{ij}). The mean score for province j (β_{0j}) was modeled as a function of the grand mean score in the sample (γ_{00}) and a province-specific deviation from the mean (u_{0j}).

Model 1 (Tables S3–S8) illustrates the null model for the six dimensions, respectively. The results of the null models suggested that there was significant variability in the six dimensions of SWB between the provinces, as the ICC ($\tau_{00}/[\tau_{00} + \sigma^2]$) ranged from 0.024 to 0.065.

3.2 | The relationships between family SES and the six dimensions of SWB

On the basis of Model 1, Model 2 added family SES as an individual-level factor, with gender and age as the control variables. Family SES positively correlated with LS-P, PPA, HFE, and FPA (Model 2 in Tables S3, S4, S6, and S7). However, it negatively correlated with PNA and FNA (Model 2 in Tables S5 and S8).

On the basis of Model 2, random slope multilevel models (Model 3 in Tables S3–S8) were used to examine whether the relationships between family SES and the six dimensions of SWB differed among the 31 provinces. The results of Model 3, illustrated in Tables S3–S8, showed that the correlations between family SES and the six dimensions did not vary across the 31 provinces ($p > .05$).

3.3 | The relationships between provincial-level factors and the six dimensions of SWB

On the basis of Model 3, we developed four separate models (Models 4, 6, 8, and 10 in Tables S3–S8) to examine the relationships between provincial-level factors and the six dimensions of SWB. The equations below reflect the estimated model for the six dimensions of SWB:

$$\text{Level 1 (student):} \Upsilon_{ij} = \beta_{0j} + \beta_{1j}(\text{age}) + \beta_{2j}(\text{gender}) + \beta_{3j}(\text{SES}) + r_i,$$

$$\text{Level 2 (province):} \beta_{0j} = \gamma_{00} + \gamma_{0n}(\text{provincial} - \text{level factor}) + u_{0j},$$

$$\beta_{1j} = \gamma_{10}; \beta_{2j} = \gamma_{20}; \beta_{3j} = \gamma_{30}; n = 1, 3, 5, 7.$$

For LS-P (see Models 4, 6, 8, and 10, shown in Table S3), we found significant and nonsignificant correlations with the provincial-level factors: GDP per capita, $\gamma_{01} = 0.272$, 95% confidence interval (CI) (−0.142, 0.686), $t = 1.29$, $p = .198$; years of education per capita, $\gamma_{03} = 1.554$, 95% CI (0.532, 2.576), $t = 2.98$, $p = .003$; average life expectancy, $\gamma_{05} = 0.584$, 95% CI (0.149, 1.019), $t = 2.63$, $p = .008$; HDI, $\gamma_{07} = 26.336$, 95% CI (5.893, 46.779), $t = 2.52$, $p = .012$.

For PPA (see Models 4, 6, 8, and 10, shown in Table S4), we found significant and nonsignificant correlations with the provincial-level factors: GDP per capita, $\gamma_{01} = 0.112$, 95% CI (−0.035, 0.259), $t = 1.49$, $p = .136$; years of education per capita, $\gamma_{03} = 0.617$, 95% CI (0.265, 0.969), $t = 3.43$, $p = .001$; average life expectancy, $\gamma_{05} = 0.221$, 95% CI (0.068, 0.375), $t = 2.82$, $p = .005$; HDI, $\gamma_{07} = 10.503$, 95% CI (3.359, 17.647), $t = 2.88$, $p = .004$.

For PNA (see Models 4, 6, 8, and 10, shown in Table S5), we found significant and nonsignificant correlations with the provincial-level factors: GDP per capita, $\gamma_{01} = -0.075$, 95% CI (−0.204, 0.054), $t = -1.14$, $p = .256$; years of education per capita, $\gamma_{03} = -0.407$, 95% CI (−0.744, −0.070), $t = -2.36$, $p = .018$; average life expectancy, $\gamma_{05} = -0.202$, 95% CI (−0.337, −0.068), $t = -2.94$, $p = .003$; HDI, $\gamma_{07} = -8.732$, 95% CI (−15.169, −2.295), $t = -2.66$, $p = .008$.

For HFE (see Models 4, 6, 8, and 10, shown in Table S6), we found significant and nonsignificant correlations with the provincial-level factors: GDP per capita, $\gamma_{01} = 0.188$, 95% CI (−0.030, 0.407), $t = 1.69$, $p = .091$; years of education per capita, $\gamma_{03} = 1.051$, 95% CI (0.553, 1.548), $t = 4.14$, $p < .001$; average life expectancy, $\gamma_{05} = 0.415$, 95% CI (0.201, 0.630), $t = 3.79$, $p < .001$; HDI, $\gamma_{07} = 18.536$, 95% CI (8.416, 28.656), $t = 3.59$, $p < .001$.

For FPA (see Models 4, 6, 8, and 10, shown in Table S7), we found significant and nonsignificant correlations with the provincial-level factors: GDP per capita, $\gamma_{01} = 0.068$, 95% CI (−0.060, 0.196), $t = 1.05$, $p = .296$; years of education per capita, $\gamma_{03} = 0.554$, 95% CI (0.248, 0.861), $t = 3.54$, $p < .001$; average life expectancy, $\gamma_{05} = 0.190$, 95% CI (0.057, 0.324), $t = 2.79$, $p = .005$; HDI, $\gamma_{07} = 8.955$, 95% CI (2.707, 15.203), $t = 2.81$, $p = .005$.

For FNA (see Models 4, 6, 8, and 10, shown in Table S8), we found significant and nonsignificant correlations with the provincial-level factors: GDP per capita, $\gamma_{01} = -0.016$, 95% CI (−0.117, 0.085), $t = -0.31$, $p = .757$; years of education per capita, $\gamma_{03} = -0.217$, 95% CI (−0.493, 0.059), $t = -1.54$, $p = .124$; average life expectancy, $\gamma_{05} = -0.122$, 95% CI (−0.235, −0.010), $t = -2.14$, $p = .033$; HDI, $\gamma_{07} = -4.798$, 95% CI (−10.097, 0.501), $t = -1.77$, $p = .076$.

In summary, the significant provincial-level positive slopes demonstrated increases in LS-P, PPA, FPA, and HFE as years of education per capita, average life expectancy, and the HDI increased. The significant provincial-level negative slopes demonstrated a decrease in PNA as the years of education per capita, average life expectancy, and the HDI increased; a decrease in FNA as the average life expectancy increased. GDP per capita were not significantly associated with these six dimensions of SWB.

3.4 | The moderating role of provincial-level factors on the relationships between family SES and the six dimensions of SWB

For LS-P, PPA, FPA, and HFE (Models 5, 7, 9, and 11, illustrated in Tables S3, S4, S6, and S7), none of the four provincial-level factors moderated the relationship between family SES and these four dimensions of SWB ($p > .05$).

For PNA (Models 5, 7, 9, and 11, illustrated in Table S5), the following provincial-level factors moderated the relationship between family SES and PNA: GDP per capita, $\gamma_{02} = 0.022$, 95% CI (0.008, 0.036), $t = 3.13$, $p = .002$; years of education per capita, $\gamma_{04} = 0.051$, 95% CI (0.007, 0.094), $t = 2.28$, $p = .023$; average life expectancy, $\gamma_{06} = 0.021$, 95% CI (0.003, 0.040), $t = 2.26$, $p = .024$; HDI, $\gamma_{08} = 1.094$, 95% CI (0.253, 1.935), $t = 2.55$, $p = .011$.

For FNA (Models 5, 7, 9, and 11, shown in Table S8), the following provincial-level factors moderated the relationship between family SES and negative affect toward future life: GDP per capita, $\gamma_{02} = 0.016$, 95% CI (0.002, 0.029), $t = 2.22$, $p = .026$; years of education per capita, $\gamma_{04} = 0.043$, 95% CI (0.003, 0.082), $t = 2.10$, $p = .036$; average life expectancy, $\gamma_{06} = 0.025$, 95% CI (0.010, 0.040), $t = 3.19$, $p = .001$; HDI, $\gamma_{08} = 1.089$, 95% CI (0.350, 1.828), $t = 2.89$, $p = .004$.

Simple slope analyses (Table 2) demonstrated that, in provinces with relatively less or short years of education per capita, GDP per capita, average life expectancy, or the HDI, the relationship between family SES and adolescents' PNA and FNA were stronger (Figures S1–S8).

TABLE 2 Conditional effect of SES on present negative affect and negative affect toward future life at different levels of provincial-level factors

Dependent variables	Provincial-level factors	Different levels of provincial-level factors	B	S. E.	t
Present negative affect	Gross domestic product per capita	$M - SD$	−0.24	0.03	−7.81**
		M	−0.17	0.02	−8.08**
		$M + SD$	−0.10	0.03	−3.41**
	Per capita years of education	$M - SD$	−0.23	0.04	−6.27**
		M	−0.17	0.02	−7.37**
		$M + SD$	−0.11	0.03	−3.45**
	Average life expectancy	$M - SD$	−0.23	0.04	−6.05**
		M	−0.17	0.02	−6.91**
		$M + SD$	−0.11	0.03	−3.32**
	Human development index	$M - SD$	−0.23	0.04	−6.45**
		M	−0.17	0.02	−7.28**
		$M + SD$	−0.11	0.03	−3.24**
Negative affect toward future life	Gross domestic product per capita	$M - SD$	−0.22	0.03	−7.11**
		M	−0.17	0.02	−8.02**
		$M + SD$	−0.12	0.03	−4.15**
	Per capita years of education	$M - SD$	−0.22	0.03	−6.56**
		M	−0.17	0.02	−7.85**
		$M + SD$	−0.12	0.03	−4.03**
	Average life expectancy	$M - SD$	−0.24	0.03	−7.62**
		M	−0.17	0.02	−8.38**
		$M + SD$	−0.10	0.03	−3.70**
	Human development index	$M - SD$	−0.23	0.03	−7.36**
		M	−0.17	0.02	−8.25**
		$M + SD$	−0.11	0.03	−3.72**

Note: M is the mean of a provincial-level factor across 31 provinces. SD is the standard deviation of a provincial factor across 31 provinces.

**$p < .01$.

4 | DISCUSSION

Previous studies have explored the role of regional-level factors in explaining children's and adolescents' present-oriented SWB (e.g., Du et al., 2019; Newland et al., 2019). However, this study contributes to the existing literature through examining how family- and provincial-level factors are related to adolescents' present- and future-oriented SWB. To the best of our knowledge, this is the first study to examine the role of family- and specific provincial-level factors in adolescents' present- and future-oriented SWB across 31 provinces of China. This study could help to identify adolescents who may be at risk for lower present- and future-oriented SWB due to factors that are beyond their control. Moreover, this study provides information that could be used to improve specific aspects of the macrosystem.

As expected, we found that students from low SES families had low present-oriented SWB, consistent with previous research results (e.g., W. Chen et al., 2016; Yan et al., 2021), and low future-oriented SWB. Students with low SES often have a low-quality living environment and insufficient educational resources (Sohr-Preston et al., 2013), which could make them feel unhappy about their present life. Furthermore, in a disadvantaged situation, students with low SES are likely to feel pessimistic about their future life, as people simulate their future life based on their past experiences (Schacter & Addis, 2007). In addition to factors relating to parents and family resources and the family process factors (highlighted in family investment and family stress models, as noted in Introduction) that may explain the relationship between SES and SWB, studies have found that people with low SES or substantial family economic hardship are more likely to experience discrimination (Bao et al., 2016) and have a low sense of control over the outcome of their actions (Kraus et al., 2009), both of which are likely to be detrimental to one's present- and future-oriented SWB (Benner et al., 2018; X. Liu & Zhao, 2016; Urzúa et al., 2018). Future studies might usefully explore the underlying mechanisms accounting for the relationships between family SES and adolescents' present- and future-oriented SWB.

The results of this study accord with the understandings of ecological systems theory that a macrosystem can affect an individual's development (Bronfenbrenner, 1989) and of livability theory that living conditions can affect one's evaluation of one's life (Veenhoven & Ehrhardt, 1995). In this study, approximately 2%–7% of the variations in Chinese adolescents' SWB could be attributable to provincial differences, which was similar to a previous result (Du et al., 2019). Furthermore, this study used different provincial-level indicators to investigate the relationship between provincial development levels and adolescents' SWB. We found that years of education per capita, average life expectancy, and the HDI were associated with adolescents' present- and future-oriented SWB, while GDP per capita was not associated with adolescents' present- and future-oriented SWB.

This study showed that when the years of education per capita in a province were relatively high, the adolescents had more present- and future-oriented SWB. People with a higher level of education have been found to be more likely to have higher incomes (Peng & Zhang, 2017), stronger awareness of legal rights' protection (Liang et al., 2017), and a higher level of kindness, empathy, and friendliness (X. Liu et al., 2016) than their counterparts in China. These factors might jointly contribute to adolescents' SWB toward their present life as the mutually reinforcing presence of these factors could create a positive atmosphere of interpersonal interaction for adolescents. Moreover, Bandura (1977) posited that expectations or self-efficacy could be derived from vicarious experiences. Therefore, if adolescents live in a province where they are exposed to highly educated people with good jobs, high incomes, and many character strengths, they may form more positive expectations and attitudes about their futures. Future studies might usefully incorporate measures of perceptions of others' interpersonal characteristics (e.g., kindness, empathy, and friendliness), the number of role models, or self-efficacy to examine the underlying mechanisms accounting for the relationships between years of education per capita and adolescents' present- and future-oriented SWB.

This large-scale study also found that each province's average life expectancy was significantly associated with adolescents' present- and future-oriented SWB. Maintaining good health or longevity is one of the basic physiological needs of people. Average life expectancy reflects ones' health status and the medical resource of a region to some extent, both of which are predictors of people's happiness (Graham, 2008; L. Li & Guo, 2019; Zhao & Yang, 2017). People may have death anxiety due to a consciousness of death's certainty (Rosenblatt et al., 1989); thus lower average life expectancy may cause adolescents to have more death anxiety and worry about their future life. On the contrary, high SWB appears to aid longevity, with previous longitudinal studies finding that SWB predicts increased longevity (Gana et al., 2016; Sadler et al., 2011). Future studies should examine whether death anxiety in relation to average life expectancy predicts adolescents' present- and future-oriented SWB and whether adolescents' present- and future-oriented SWB is associated with their longevity.

According to the understandings of livability theory, if adolescents live in provinces with higher levels of social development (as indicated by the HDI), they will have higher levels of present- and future-oriented SWB. Consistent with previous research results (Cho, 2019; Klocke et al., 2014; Lee & Yoo, 2015; Main et al., 2019; Newland et al., 2019), GDP per capita was not significantly associated with adolescents' present- and future-oriented SWB. These results have two implications. On the one hand, it could be inferred that GDP is not a complete representation of a region's development (Ahluwalia, 1976; Hicks & Streeten, 1979), and a comprehensive development index such as the HDI can better represent the development level of a region than a single economic development index (GDP per capita). Therefore, to ensure effective development, a region

needs to develop not only its economy but also its education- and health-related resources. On the other hand, the adolescents living in less developed areas reported lower levels of present- and future-oriented SWB, which suggests that in less developed areas, more psychologically focused education activities are needed to improve adolescents' present- and future-oriented SWB.

Consistent with our hypothesis, it was found that, in less developed regions, the relationships between SES and adolescents' present- and future-oriented negative affect were stronger than in more developed regions. These results accord with the results of a meta-analysis conducted by Howell and Howell (2008). As noted, need theory posits that income and assets make the most significant contribution to SWB when these factors satisfy basic physiological needs. In regions with higher levels of education, health, or economic development, adolescents may be above the threshold of physiological need fulfillment as they have abundant resources. Alternatively, in regions with lower levels of education, health, or economic development, adolescents may be below or near the threshold of physiological need fulfillment as they have limited resources. Therefore, rises in family SES were more closely related to adolescents' PNA in less developed provinces than in more developed provinces. Schacter and Addis (2007) claim that people simulate their future life based on their past experiences. Therefore, the relationships between family SES and regional factors and FPA mirrored the pattern between family SES and PNA. Future studies should examine whether perceived need fulfillment is higher in more developed regions than in less developed regions and whether it could moderate the relationship between family SES and adolescents' SWB. Another possible explanation for this phenomenon is that adolescents from developed regions may have higher standards and expectations about their living conditions, making their SWB less susceptible to the effects of their family's SES (Du et al., 2019; Graham, 2008), which also needs further examination.

In summary, this study's results suggest that low family SES and varying types and degrees of provincial underdevelopment, either separately or more so in combination, are likely to negatively affect adolescents' present- and future-oriented wellbeing.

5 | LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study had some limitations. First, stratified sampling was not adopted within the provinces, and the sample size from some provinces was relatively small, which may have led to scalar invariance violation in some dimensions. Second, this study only selected objective individual-level indicators. Future studies should select more subjective indicators and microsystem factors, such as subjective family socioeconomic status and perceptions of parenting styles. Third, this was a cross-sectional study; therefore, causal inferences could not be drawn. Fourth, family income was not included in the measure of SES. Future studies could measure SES by using the Family Affluence Scale (FAS) (Zou et al., 2018), which asks participants to report on the following four items: ownership of a family car, van, or truck; possession of their own bedroom; travel times during the past 12 months; possession of family computer(s). SES measured using the FAS is found to be positively related to adolescents' LS-P (Zou et al., 2018).

6 | CONCLUSION

This study has several implications. First, the mental health status of adolescents from low family SES in underdeveloped areas is of particular concern because their SWB was relatively low. Therefore, more psychologically focused education activities are needed to improve these adolescents' present- and future-oriented SWB. Future research is recommended to identify relevant protective factors and interventions to improve adolescents' present- and future-oriented SWB. Second, the level of economic, education, and health development in some provinces needs to be improved. Third, the results indicate that there are likely to be provincial or regional differences in adolescents' present- and future-oriented SWB within a country. Future studies should examine differences in adolescents' SWB not only between countries but also between regions within a country. Finally, this study found that some provincial-level education- and health-related indicators could predict adolescents' SWB. Future studies should also consider these indicators when examining the predictive value of macrosystem factors in adolescents' present- and future-oriented SWB.

CONFLICT OF INTERESTS
The authors declare that there are no conflict of interests.

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