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on Adolescent Subjective Well-Being and
the Moderating Role of Perceived Academic
Pressure: Longitudinal Evidence for China**

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ABSTRACT

The Effect of Parental Educational Expectations on Adolescent Subjective Well-Being and the Moderating Role of Perceived Academic Pressure: Longitudinal Evidence for China

Although the strong positive correlation between parental educational expectations (PEE) and child academic achievement is widely documented, little is known about PEE's effects on child psychological outcomes and the mechanisms through which it may work. Hence, in this paper, using nationally representative data from the 2013-2014 and 2014-2015 waves of the China Education Panel Survey, we investigate PEE's causal impact on adolescent subjective well-being (SWB) and the moderating role of the academic pressures that these adolescents perceive. Even though we find robust evidence for a positive causal relation between PEE and adolescent SWB, its moderation by adolescent-perceived academic pressure is negative. In addition, the facts that the benefits of PEE are greater for female adolescents and those from immigrant, one-child, and nonpoor families suggests that it may operate on adolescent SWB through increased family resources, improved family relationships, and higher adolescent aspirations linked to higher PEE.

JEL Classification: I21, I30, J13

Keywords: China, parental educational expectations, adolescents, subjective well-being

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1 Introduction

As a formative phase of human development (Garipey et al., 2017), adolescence is an important transitional period characterized by mood swings, the emergence of mental illness, and declining subjective well-being (SWB) (González-Carrasco et al., 2017; Jach et al., 2018). Given the social burden that mental health disorders impose globally (13.0 percent of disability-adjusted life years and 32.4 percent of years lived with disability; Vigo et al., 2016), adolescent mental health warrants particular concern, especially as depression is now the leading cause of adolescent illness and disability worldwide (Fruehwirth et al., 2019). Adolescence also brings significant physical and cognitive changes that, when paired with stress and crisis, impair adolescents' ability to experience high SWB (Orkibi et al., 2014). This lowering of SWB may in turn give rise to a series of critical consequences at the micro and macro levels, including worse academic performance (Suldo et al., 2011), lower self-esteem (Lin & Yi, 2017), health-risking behaviors (Bergman & Scott, 2001), and even economic losses from mental health disorders (Bursztyn et al., 2019). Successfully addressing this potential deterioration in adolescent SWB requires a deeper understanding of its determinants, especially the important predictive familial factor of parental educational expectations (PEE), which manifest as parental estimations of and beliefs about their child's potential accomplishments, including highest attainable educational level, course achievement, and/or class attendance (Long & Pang, 2016).

One of the several contributions made by our paper is its exploration of whether the relation between PEE and adolescent SWB can validly be interpreted as causal. To identify such relations, it overcomes the strategically problematic presence of measurement errors, reverse

causality, and omitted variable and sample selection biases by employing several different models using either an instrumental variable (IV) approach that tackles the endogeneity problem or a propensity score matching with difference-in-differences (PSM-DID) that addresses selectivity issues.

Our analysis also constitutes the first longitudinal analysis for China, a unique investigative for this topic because the culturally shaped Chinese definition of subjective well-being differs massively from that in Western cultures. This difference stems primarily from the Chinese emphasis on contributing to society as a significant means of attaining happiness (Lu, 2001) and its favoring of “no pain, no gain” over intense hedonic pleasure (Lu, 2001). As a result, Chinese adolescents, even when exposed to materialistic values that facilitate hedonism and the pursuit of pleasure (Lins et al., 2013), may highlight the importance of pursuing meaning as the path to happiness (Yang et al., 2017).

A third contribution is our exploration of whether the stresses perceived by the adolescents may moderate the linkage between their SWB and PEE. Although several relevant studies in psychology and sociology suggest that high parental expectations positively impact the child’s well-being (Lippman et al., 2011), if the latter perceives such expectations to be excessive, the ramifications may be negative (Ang et al., 2009). It is therefore plausible to assume that the academic pressures arising from such expectations may play a negative moderating role in the PEE-SWB nexus, a role that as yet appears neglected in the research. Our work then fills yet another important research void by leveraging a rich set of Chinese Educational Panel Survey (CEPS) data on family resources, family relationships, and adolescent aspirations to extend our exploration of this nexus to the underlying pathways through which PEE may work on

adolescent SWB.

The general conclusion of our study is that there does indeed exist a causal relation between PEE and adolescent SWB, one likely to be negatively moderated by the academic pressures that the adolescents perceive. Given our finding that PEE has greater benefits for female adolescents and those from immigrant, one-child, and nonpoor families, we hypothesize that PEE may operate on adolescent SWB through increased family resources for this age group, improved family relationships, and higher adolescent aspirations linked to higher PEE. We outline the derivation of these findings as follows: after reviewing the relevant literature in Section 2, we describe the data and methods in Section 3, report our results in Section 4, and discuss the implications of our findings in Section 5.

2 Extant literature

2.1 Adolescent SWB and its determinants

For adolescents, the SWB mindset forms gradually during childhood and adolescence, triggering a positive development spiral when the living environment is conducive to the development of positive self-evaluation (Telef & Furlong, 2017). SWB thus not only plays a crucial role in adolescents' social adaptation and healthy development but exerts a major influence on adulthood, possibly serving as a buffer against any deleterious outcomes (Tomyn & Cummins, 2011; Walter & Shenaar-Golan, 2017).

Given the importance of SWB in adolescence, its determinants are the subject of a broad body of literature (Aminzadeh et al., 2013; Buijs et al., 2016; Garipey et al., 2017; Lin & Yi, 2017; Sheldon et al., 2004; Suldo et al., 2015), which identifies family socioeconomic status

(Buijs et al., 2016; Garipey et al., 2017), family cohesion (e.g., parent-child relationship) (Lin & Yi, 2017), personality characteristics (e.g., conscientiousness and extraversion) (Suldo et al., 2015), social support (Aminzadeh et al., 2013), and goal-oriented activities (Sheldon et al., 2004) as significant predictors of SWB in adolescence. It is also worth noting that collectivist cultures (especially Confucian societies like China, Japan, and Korea) tend to emphasize social and cultural SWB predictors such as social relations and interpersonal attachment (Lee et al., 2011; Tian et al., 2013), whereas individualist cultures, in particular European and American, give more salience to individual-level factors (such as self-esteem, self-compassion, and personal success (Neff, 2011; Schmuck et al., 2000).

2.2 The role of PEE in adolescent SWB

According to the most recent research, PEE has the ability to positively affect adolescent educational attainment (Ahiakpor & Swaray, 2015; Benner et al., 2016; Lazarides et al., 2016; McCoy et al., 2016), athletic skills (Coakley, 2006), child social competence (Ren & Pope Edwards, 2015), sedentary behaviors (Li et al., 2017), and parental financial investment in their children's education (Ahiakpor & Swaray, 2015; Kim et al., 2018). One Egyptian analysis of 233 adolescents aged 14-17 (Eryilmaz, 2011) also documents that positive parental expectations for the future are positively associated with adolescent SWB.

Nonetheless, information about the nexus between PEE and adolescent SWB is scant, except for a handful of studies that address cultural and gender differences and/or the (mis)match between child and parental expectations. For instance, Oishi and Sullivan (2005) show that American college students who report having fulfilled parental expectations to a greater degree than their peers have higher levels of life satisfaction and self-esteem than their

Japanese counterparts. On the other hand, Flouri and Hawkes's (2008) analysis of data from the 1970 British Cohort Study (BCS70) identifies marked gender differences, with mothers' expectations when the child is 10 being positively correlated to daughters' sense of control at age 30 but uncorrelated with sons' adult psychological outcomes. The importance of parental expectations as a key predictor of child psychological well-being is amply documented by Qin (2008) in an analysis of qualitative 5-year survey data for 20 nondistressed and 18 distressed adolescents from Chinese immigrant families in the US, who have high and low levels of psychological well-being, respectively. His results suggest that parental expectations are responsible for an achievement-adjustment paradox among Asian American students, who, often report poor psychological adjustment even when their academic achievement levels are high. This importance of this linkage is further underscored by Rutherford's finding (2015) – based on data from the 2007 Child Development Supplement (CDS) III of the Panel Study of Income Dynamics (PSID) – that middle-school children whose expectations mismatch those of their parents have lower well-being.

Theoretically, PEE is most likely to exert a beneficial influence when parents' high expectations for their children's educational attainment largely reflect their concern, interest, and family investment in their offspring's lives, which in turn is conducive to healthy adolescent SWB (Hao & Yeung, 2015; Sandefur et al., 2006). Nonetheless, PEE may also be associated with the youngsters' own expectations and interrelated attitudes of self-control, self-confidence, commitment, and challenge, which facilitate their management of stressful situations and crises and their development of resilience (Flouri & Hawkes, 2008; Kim et al., 2015). As both Ronen et al. (2016) and Drake et al. (2008) emphasize, individuals who are more resilient and future-

oriented are less likely to exhibit psychopathological symptoms and more optimistic, which perpetuates their positive functioning and may raise SWB.

Nevertheless, high parental expectations for their children's education can be detrimental to adolescent SWB, particularly for those in Confucian societies like China, where harsh parenting styles are prevalent. These Confucian underpinnings of family interactions and structure in traditional Chinese families – which underscore filial piety and hierarchical relationships – imply the child's obligation to be ever obedient and respectful to parents and care for them in their later years (Lim and Lim, 2003). By extension, Confucianism as it pertains to child rearing highlights academic success and high parental expectations for academic achievement (Chao, 1994).

Yet this Chinese value system, although it fosters academic excellence, may do so at the cost of quality parent-child relationships and child psychological problems such as high anxiety levels associated with test taking (Lim and Lim, 2003). In particular, authoritarian parenting and higher expectations for children are generally associated with lower levels of acceptance and warmth, restrictions on child autonomy, and frequent use of coercive disciplinary strategies, including verbal hostility and corporal punishment (Baumrind, 1996), all of which negatively impact child SWB (Wang et al., 2007).

In the Chinese context specifically, Wang and Heppner (2002) find that a self-perception of *living up to* parental expectations is a better predictor of psychological distress among Taiwanese college students than the parental expectations themselves. Even more interesting, Found and Sam (2013) demonstrate that although neither gender nor birth order has any significant impact on PEE among 344 Chinese college students, those born in mainland China

report much higher PEE than those from Macau.

Overall, several aspects of the literature are worth emphasizing: First, the empirical results suggest that PEE positively affects adolescent SWB as measured by certain indicators, including anxiety, life satisfaction, and self-esteem. Second, because previous research on PEE and adolescent SWB is strongly dominated by studies in Western countries, generalizing the findings to countries like China, with its unique traditional culture and high PEE, is highly problematic. Third, except for Qin's (2008) analysis of 5 years of survey data on Chinese immigrant college students in the US, most studies suffer from the weaknesses of cross-sectional design. Lastly, information on the paths through which PEE affects adolescent SWB is scant. To remedy these shortcomings, in this paper, we analyze two separate waves of CEPS panel data to identify the causal impact of PEE on adolescent SWB in China while also exploring the possible moderating role of adolescent-perceived academic pressures and the potential mechanisms through which PEE may influence adolescent SWB.

3 Data and methods

3.1 Survey and study sample

This study exploits data from the 2013-2014 and 2014-2015 waves of the CEPS, a nationally representative longitudinal panel survey of Chinese junior high students selected through a multistage stratified design that first samples middle schools and then the students within them. By administering separate questionnaires to students, parents, teachers, and school principals, the survey amasses a rich set of multilevel information on student characteristics, family structures, and school features (Li et al., 2017). The survey's baseline wave (2013-2014)

encompassed 19,487 seventh and ninth graders from 112 schools in 28 regions of China, while the second wave (2014-2015) included 10,751 students from the same schools, with a large proportion of respondents resurveyed. For this study, we use a mostly unbalanced panel that yields a final sample of 28,499 Chinese students (14,682 boys and 13,817 girls) aged 11-17 years.

3.2 SWB Measures

Following Telef and Furlong (2017), we define SWB as having an affective component (the adolescents' own assessment of their recent emotions and feelings) and a cognitive component (their perceived happiness). We measure these components based on responses to a CEPS survey item asking respondents whether, during the previous week, they had felt (i) discouraged, (ii) depressed, (iii) meaningless, (iv) sad, or (v) unhappy. Respondents indicated the frequency of each feeling on a 5-point scale of 1 = never, 2 = seldom, 3 = sometimes, 4 = often, and 5 = always. We first recode the responses so that the higher values represent higher SWB (i.e., fewer negative emotions) and then generate a composite SWB score by summing the values for all five emotions, which yields a total score between 5 and 25 with higher values indicating higher levels of SWB. According to the distribution of SWB subdomains (Table 1), most students report a low frequency of negative emotions, with 59.16 percent reporting rarely or never feeling unhappy compared to only 8.47 percent admitting to always or frequently having such feelings.

Table 1 Distribution of SWB subdomains

	Category (%)					Mean
	1 = always	2 = often	3 = sometimes	4 = seldom	5 = never	
Discouraged	3.04	5.62	32.42	33.66	25.26	3.725
Depressed	3.11	6.27	22.84	30.51	37.27	3.926
Meaningless	3.60	4.72	14.30	24.29	53.09	4.185
Sad	3.34	5.13	22.44	34.58	34.51	3.918
Unhappy	3.77	7.31	29.76	34.80	24.36	3.687

3.3 PEE

We measure our key explanatory variable PPE based on responses to the question, “How far do you expect your child to go in his/her education?,” the options for which range from 1 = drop out now, 2 = graduate from junior high school, 3 = attend technical secondary/technical school, 4 = attend vocational high school, 5 = attend senior high school, 6 = graduate from junior college, 7 = earn a bachelor’s degree, 8 = earn a master’s degree, and 9 = earn a doctorate. We convert this 9-point scale to a binary variable (dummy) equal to 1 if the expectation is a master’s or doctoral degree and 0 otherwise. Such a measure of PEE has been widely used in the literature (e.g., Hao & Yeung, 2015; Roth & Salikutluk, 2012).

3.4 Moderating variable: adolescent-perceived academic pressure

Our moderating variable, the academic pressure perceived by the adolescents, is measured based by responses to “How much pressure do you feel from your studies?”, ranked from 1 = no pressure at all to 5 = tremendous pressure. For simplicity, we again recode the multipoint scale to a binary variable (dummy) equal to 1 if the pressure reported is some or tremendous and 0 otherwise.

Following both Walter and Shenaar-Golan (2017) and Yap and Baharudin (2016), we also control for several demographic and socioeconomic variables that are relevant for adolescent SWB, including age, self-reported health (SRH), family economic status, adolescent migration

status, and only child status. In particular, we control for four items that proxy the family interrelations vital to healthy child development (Lu et al., 2018); namely, mother-child relationship, father-child relationship, spousal relationship, and adolescent residential status (i.e., in or out of the parental home). Similarly important, because Chinese parents tend to maintain strict control over their children's behaviors – including study, entertainment, and extracurricular activities (Wang et al., 2007) – we control for cram school participation, hours of TV viewing, and frequency of Internet use. Lastly, in addition to year dummies (with 2013-2014 as the reference group), we include school and regional effects to capture unobserved factors at these levels.

As Table 2 shows, the mean age of the adolescents in the sample is around 14 years, although the girls are slightly younger than the boys. The girls also report somewhat lower levels of SWB than the boys, perhaps because Chinese parents, despite showing a preference for sons (especially in rural China; Das Gupta et al., 2003), report higher educational expectation for daughters. One possible reason is that economic openness and urbanization in China has allowed some Chinese parents to let go their traditional preference for sons, which the feminization of migration in China has also greatly attenuated in origin communities (Lu & Tao, 2015). Nevertheless, gender differences in SWB and PEE are small. Where we do note quite a large difference between boys and girls is in academic pressure, with boys having a 6 points higher probability of experiencing academic pressure than girls.

Table 2 Descriptive statistics

Variables	Full sample	Boys	Girls	MD
SWB (5-25)	19.45 (4.25)	19.60 (4.42)	19.29 (4.06)	0.31***
PEE (1=higher; 0=lower)	0.33 (0.47)	0.32 (0.46)	0.34 (0.47)	-0.02***
Academic pressure (1=higher; 0=lower)	0.36 (0.48)	0.39 (0.49)	0.33 (0.47)	0.06***
Gender (1=boys; 0=girls)	0.52 (0.50)			
Age	13.54 (1.09)	13.59 (1.09)	13.48 (1.09)	0.11***
Self-reported health (SRH, 1=good; 0=other)	0.71 (0.45)	0.73 (0.44)	0.69 (0.46)	0.04***
Migration status (1=migrant child; 0=other)	0.21 (0.41)	0.22 (0.41)	0.21 (0.40)	0.01**
Only-children (1=only child; 0=other)	0.43 (0.49)	0.46 (0.50)	0.39 (0.49)	0.07***
Emotionally close to the mother (1=higher; 0=lower)	0.71 (0.46)	0.68 (0.47)	0.73 (0.44)	-0.05***
Emotionally close to the father (1=higher; 0=lower)	0.58 (0.49)	0.58 (0.49)	0.57 (0.49)	0.01*
Spousal relationship (1=good; 0=other)	0.57 (0.50)	0.56 (0.50)	0.58 (0.49)	-0.02***
Residential status (1=living with parents; 0=other)	0.88 (0.33)	0.87 (0.33)	0.88 (0.32)	-0.01**
Family economic status (1=poor; 0=other)	0.20 (0.40)	0.20 (0.40)	0.19 (0.39)	0.01*
Cram school participation (1=attending; 0=other)	0.31 (0.46)	0.28 (0.45)	0.33 (0.47)	-0.05***
TV viewing time (1=intensive; 0=other)	0.60 (0.49)	0.61 (0.48)	0.58 (0.49)	0.03***
Internet use (1=intensive; 0=other)	0.52 (0.50)	0.55 (0.50)	0.49 (0.50)	0.06***

Note: MD=mean difference. Standard deviations are given in parentheses. Significance levels, obtained from *t*-tests, are **p* < 0.1, ***p* < 0.05, ****p* < 0.01.

Source: CEPS 2013/2014 and 2014/2015.

3.5 Empirical strategies

Because the interval between the two CEPS waves is rather short and our key independent variables vary little within it, we reject the use of a fixed effects (FE) estimator to partially rule out endogeneity issues because it may result in statistical insignificance in the variables of interest even when they are economically significant (Arampatzi et al., 2018). Rather, to capture time-variant unobserved individual heterogeneities, we use a random effects (RE) estimation whose appropriateness (*p*-value>0.1) we confirm via a Hausman test. We thus measure the impact of PEE on adolescent SWB by estimating the following equation:

$$SWB_{it} = \alpha PE_{it} + \beta AP_{it} + \gamma X_{it} + \varepsilon_{it} \quad (1)$$

where SWB_{it} is the subjective well-being of adolescent i in wave t , PE_{it} represents adolescent i 's PEE in wave t , AP_{it} denotes the academic pressure adolescent i perceives

during wave t , X_{it} represents a vector of covariates, and ε_{it} is the error term. As an additional step, we estimate a second equation to assess the moderating effect of academic pressure on the relation between PEE and adolescent SWB:

$$SWB_{it} = \alpha PE_{it} + \beta AP_{it} + \varphi(PE_{it} \times AP_{it}) + \gamma X_{it} + \varepsilon_{it} \quad (2)$$

where $PE_{it} \times AP_{it}$ represents the interaction term between PEE and adolescent SWB.

To rule out potential endogeneity in PEE, we first employ an IV (2SLS, RE-IV, IV-Heckit) approach that uses two sets of instruments: parental education levels and prevalence of high PEE at the classroom level. The first set is borrowed from seminal work by Davis-Kean (2005), who demonstrates that PEE significantly mediates the relation between parental education and child achievement. Accordingly, we hypothesize that parental education levels are more likely to be correlated with PEE because of their important role in shaping child-related beliefs and values (Horta çsu, 1995). One potential threat to the validity of this instrument set, however, is that parental education may also be related to both child educational opportunities (Hao & Yeung, 2015) and parental time investment in their children (Sayer et al., 2004), which would in turn affect adolescent SWB. To account for this possibility, we also include information on family economic status and family relationships.

One caveat to our design is the obvious impossibility of controlling for all metrics that might possibly relate to PEE and the outcome variables, especially when the metric on the left side of the equation is a subjective measure. A second caveat is that although we take into account certain measurable channels through which parental education levels may affect adolescent SWB, the effect of our IVs on adolescent SWB may still operate through other unmeasurable channels beyond PEE, most especially, brain and psychological activities.

Following Acemoglu et al. (2001), we adopt two strategies to validate parental education levels as a valid instrument: first, we employ mother's and father's education as direct control variables with which to assess parental education's impact on adolescent SWB, and second, we use overidentification tests to detect whether this impact is in fact direct. The results are encouraging in that they generate no evidence that parental education directly impacts adolescent SWB.

Nonetheless, to check robustness, we use the alternative IV of high PEE being prevalent at the classroom level, measured as the proportion of parents with high educational expectations in each of their children's classes. On the one hand, this IV may positively affect PEE through the ability of social networks to exert a peer or neighborhood effect on both general parental attitudes toward education and parental expectations for their children (Roth & Salikutluk, 2012). On the other hand, being measured at the aggregate level, it is unlikely to impact adolescent SWB directly.

Finally, to check the reliability of the IV estimates, we reexamine the causal impact of PEE on adolescent SWB using PSM-DID, a commonly used matching method that, because it does not assume a linear relation between variables, can effectively address problems of endogeneity and self-selection bias (Heckman et al., 1997). The use of PSM-DID can thus significantly improve the quality of nonexperimental evaluations and identify causal relations (Blundell and Costa Dias, 2000).

4 Results

4.1 PEE and adolescent SWB

In Table 3, we first show the results of regressing adolescent SWB on PEE without controlling for covariates (columns 1 and 4), and then report the estimated PEE effect on adolescent SWB conditional on all our controls (columns 2 and 5). Next, to test whether the PEE-adolescent SWB linkages differ by perceived (higher vs. lower) academic pressure, we add in the interaction between this pressure and PEE (columns 3 and 6). As the table shows, once we adjust for covariates, PEE is uniformly and positively associated with adolescent SWB, with the SWB of adolescents with higher PEE being approximately 0.2 points greater than that of their lower PEE counterparts (columns 2 and 5). At the same time, in line with Denovan and Macaskill (2017), adolescent SWB is significantly negatively related to perceived academic pressure, with a higher academic pressure leading to a decrease in SWB by approximately 1.3 points (columns 2 and 5). The interaction between academic pressure and PEE is likewise significantly negative (columns 3 and 6), suggesting that perceived academic pressure attenuates any positive effect that PEE may have on adolescent SWB.

Table 3 OLS and RE estimates of the PEE effect on adolescent SWB

	Pooled OLS			RE		
	(1)	(2)	(3)	(4)	(5)	(6)
PEE	0.393*** (0.054)	0.184*** (0.053)	0.323*** (0.061)	0.389*** (0.055)	0.197*** (0.053)	0.314*** (0.061)
Academic pressure		-1.239*** (0.054)	-1.103*** (0.065)		-1.115*** (0.053)	-1.003*** (0.064)
PEE × academic pressure			-0.402*** (0.111)			-0.336*** (0.107)
Gender		0.383*** (0.049)	0.384*** (0.049)		0.377*** (0.053)	0.378*** (0.053)
Age		-0.243*** (0.022)	-0.243*** (0.022)		-0.249*** (0.023)	-0.250*** (0.023)
SRH		1.840*** (0.058)	1.838*** (0.058)		1.722*** (0.058)	1.721*** (0.058)
Migrant child		-0.165** (0.072)	-0.164** (0.072)		-0.139* (0.075)	-0.139* (0.075)
Only child		0.057 (0.060)	0.054 (0.060)		0.062 (0.065)	0.060 (0.065)
Emotionally close to the mother		0.944*** (0.068)	0.941*** (0.068)		0.916*** (0.068)	0.913*** (0.068)
Emotionally close to the father		0.919*** (0.058)	0.919*** (0.058)		0.873*** (0.059)	0.873*** (0.059)
Spousal relationship		0.262*** (0.076)	0.260*** (0.076)		0.208*** (0.071)	0.207*** (0.071)
Life status		0.248*** (0.088)	0.253*** (0.088)		0.197** (0.090)	0.202** (0.090)
Poor family		-0.279*** (0.065)	-0.279*** (0.065)		-0.260*** (0.066)	-0.260*** (0.066)
Cram school participant		-0.182*** (0.062)	-0.180*** (0.062)		-0.188*** (0.062)	-0.187*** (0.062)
TV viewing time		-0.090 (0.065)	-0.090 (0.065)		-0.081 (0.063)	-0.082 (0.063)
Internet use		-0.522*** (0.076)	-0.521*** (0.076)		-0.455*** (0.073)	-0.454*** (0.073)
Year effect	No	Yes	Yes	No	Yes	Yes
School effect	No	Yes	Yes	No	Yes	Yes
Region effect	No	Yes	Yes	No	Yes	Yes
Observations	26,983	26,983	26,983	26,983	26,983	26,983

Note: Standard errors are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** p value < 0.01 .

Having adopted an IV approach to address any endogeneity problem in PEE, we also check for endogeneity in the PEE-academic pressure interaction by including as instruments pair-wise interactions between mother's or father's education and academic pressure. An overidentification test demonstrates that the validity of our instruments cannot be rejected at the 1% level: the coefficients from the first-stage regression and corresponding F -test suggest that the mother's education (p -value=0.000) and father's education (p -value=0.000) are jointly and individually strong predictors of PEE (Table 4, Panel B).

Next, to determine whether maternal and paternal education levels directly impact adolescent SWB, we regress these latter on the former (Panel C), revealing that once we control for the effect of PEE, family relationships, and family economic status on adolescent SWB, neither mother's education nor father's education is significant. Not only does this latter provide strong support for the validity of parental education levels as instruments, but the Hausman test confirms the presence of endogeneity in PEE, implying that the IV results are more reliable than other estimations. Yet even after we take this endogeneity into account, PEE still has a statistically significant positive impact on adolescent SWB, while the moderating effect of academic pressure remains significantly negative.

Table 4 IV estimates for the PEE effect on adolescent SWB

	(1)	(2)	(3)	(4)
	2SLS	2SLS	RE-IV	RE-IV
Panel A: Second stage, SWB as dependent variable				
PEE	0.865**	1.370***	1.013**	1.422***
	(0.431)	(0.350)	(0.478)	(0.379)
Academic pressure	-1.250***	-0.107	-1.138***	-0.064
	(0.052)	(0.186)	(0.052)	(0.184)
PEE × academic pressure		-3.351***		-3.149***
		(0.522)		(0.521)
Controls	Yes	Yes	Yes	Yes
Observations	26,101	26,101	26,101	26,101
Panel B: First stage, PEE as dependent variable				
Mother's education	0.018***		0.017***	
	(0.002)		(0.002)	
Father's education	0.023***		0.021***	
	(0.002)		(0.002)	
Panel C: Effect of parental education on SWB, RE				
Mother's education	0.038*		0.024	
	(0.020)		(0.020)	
Father's education	0.033*		0.009	
	(0.019)		(0.018)	
PEE	No		Yes	
Family economic status	No		Yes	
Family relationships	No		Yes	
Other controls	Yes		Yes	

Note: Standard errors are in parentheses. *p < 0.1, ** p < 0.05, *** p < 0.01.

4.2 Heterogeneous effects

To better understand the consequences of PEE for adolescent SWB, we next investigate whether the estimated effects differ by gender, migrant status, number of siblings, or poor versus nonpoor families. As regards the first, we find that the positive effect of PEE is significant for adolescent girls but insignificant for boys (Table 5, Panel A, columns 1 and 2), perhaps because girls are more attached to parents and have higher affective needs than boys (Nie et al., 2016). This positive impact of PEE on SWB is even more pronounced for migrant adolescents (Panel A, columns 3 and 4), although the moderating effect of academic pressure

is insignificant for these latter while being significant for their nonimmigrant peers (Panel A, columns 11 and 12). One possible explanation is that rural-to-urban migration increases children's desire to study (Kandel & Kao, 2000) while also improving their social resilience, especially the ability to cope with stress (Adger et al., 2002). As a result, the educational expectations of migrant adolescents' parents are more likely to match the adolescents' own aspirations.

Table 5 Heterogeneous effects (RE-IV)

<i>Panel A</i>	Boys	Girls	Immigrant children	Nonimmigrant children	Only children	Child with siblings	Poor families	Nonpoor families
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PEE	0.284 (0.662)	1.876*** (0.706)	2.398** (1.158)	0.816 (0.525)	1.092** (0.544)	0.483 (0.969)	1.184 (2.301)	0.862* (0.487)
Academic pressure	-1.062*** (0.075)	-1.194*** (0.072)	-1.034*** (0.125)	-1.171*** (0.058)	-1.314*** (0.085)	-1.040*** (0.069)	-1.002*** (0.132)	-1.200*** (0.059)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,283	12,818	4,933	21,168	11,483	14,618	5,262	20,839
<i>Panel B</i>	Boys	Girls	Immigrant children	Nonimmigrant children	Only children	Children with siblings	Poor families	Nonpoor families
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
PEE	0.836* (0.499)	1.878*** (0.487)	1.086 (0.718)	1.501*** (0.408)	1.472*** (0.454)	0.796 (0.583)	-1.905** (0.952)	1.425*** (0.390)
Academic pressure	-0.115 (0.226)	-0.530** (0.268)	-1.087*** (0.351)	0.061 (0.197)	-0.337 (0.225)	-0.738** (0.319)	-1.226** (0.481)	-0.219 (0.184)
PEE × academic pressure	-2.833*** (0.644)	-1.929*** (0.744)	0.096 (0.992)	-3.622*** (0.555)	-2.461*** (0.567)	-0.938 (0.983)	0.932 (1.386)	-2.886*** (0.516)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,283	12,818	4,933	21,168	11,483	14,618	5,262	20,839

Note: Standard errors are in parentheses. *p < 0.1, ** p < 0.05, *** p < 0.01.

As regards number of siblings, although only children may receive more attention and resources from their parents, they may also be more sensitive to parental expectations and various forms of stress (Zhao & Zhou, 2018). We therefore perform separate estimations of the PEE effect on SWB among only children versus children with siblings, revealing a strong and

significant effect for only children but not for those with siblings (Panel A, columns 5 and 6). The negative moderating effect of academic pressure also manifests primarily among only children (Panel B, columns 13 and 14). An additional split analysis by family economic status (poor versus nonpoor) similarly reveals a positive PEE effect on SWB for adolescents from economically disadvantaged households but no such significant effect for those from nondisadvantaged households (Table 5, Panel A, columns 7 and 8). It does, however, show this effect to be moderated by adolescent-perceived academic pressure, particularly among adolescents from medium and upper-class families (Panel B, columns 15 and 16).

4.3 Robustness checks

In our initial tests of result robustness, we first generate a new composite index for SWB using a principal component analysis (PCA) in which the eigenvalue of one factor exceeds 1, while the scree test clearly indicates the retention of one factor accounting for 66.87% of the variance (Table 6, Panel A). We thus replace this composite index with the often-used SWB proxy of *perceived happiness* (Panel B) and then redefine our PEE variable to be equal to 1 for the expected earning of a bachelor's degree or above and 0 otherwise (Panel C). Not only are the results for all three specifications similar to those in Table 4, but re-running the estimation using a balanced student data panel and conditional on additional covariates that may correlate with PEE and adolescent SWB (e.g., adolescent-perceived PEE, adolescent grades, and frequency of parent-teacher contact) yields no notably different outcomes (Panel D).

Next, to verify our IV estimates, we begin by replacing the PEE instrument with an alternative aggregate PEE, defined as the proportion of parents in each class who have higher than average expectations for their child's academic performance (Table 6, Panel E). We then

account for possible endogeneity in academic pressure by instrumenting it as the proportion of students feeling above average academic pressure at the classroom level (Table 6, Panel F), a common social setting in which, according to stress contagion theory, stressful experiences can be transmitted from one individual to another (Oberle & Schonert-Reichl, 2016). As a final check, we use an IV-Heckit model to simultaneously address both the endogeneity and sample selection bias problems (Table 6, Panel G.). Once again, all three specifications yield results similar to those in the main analysis.

Lastly, we estimate the ATTs by comparing the change in SWB for adolescents with above-average PEE (treatment group) versus those with below-average PEE (control group; see Table 6, Panels H and I). Although our PSM-DID results confirm the causal impact of PEE on adolescent SWB (Panel H), it is worth noting that in the absence of treatment, the PSM-DID estimator requires the dependent variable to follow the parallel trend in both the treatment and the control group (Lan & Yin, 2017). We thus address any concerns about this assumption's validity by estimating the treatment effect using the semiparametric difference-in-differences (SDID) technique developed by Abadie (2005), which improves parallel trend assumption credibility by addressing any characteristics imbalance between the two groups (Houngbedji, 2016). As before, the results are almost identical to those in our main analysis (Panel I).

Table 6 Robustness checks

Not controlling for the interaction term	Controlling for the interaction term		IMR	ATT	Observations
PEE	PEE	PEE × academic pressure			
<i>Panel A: PCA-generated composite SWB measure; RE-IV</i>					
0.433** (0.206)	0.607*** (0.163)	-1.351*** (0.224)			26,101
<i>Panel B: SWB subindex with SWB proxied by perceived happiness; RE-IV</i>					
0.297*** (0.114)	0.318*** (0.092)	-0.586*** (0.130)			26,345
<i>Panel C: Dichotomous measure of PEE with an alternative threshold; RE-IV</i>					
1.159** (0.573)	1.162** (0.454)	-2.700*** (0.474)			26,101
<i>Panel D: Balanced panel sample plus additional control variables; RE-IV</i>					
1.798* (1.025)	1.212** (0.597)	-2.704*** (0.623)			17,549
<i>Panel E: Aggregate PEE (replacing PEE); RE-IV</i>					
0.934** (0.377)	1.236*** (0.389)	-0.928** (0.360)			26,983
<i>Panel F: Aggregate PEE; aggregate academic pressure (replacing academic pressure); RE-IV</i>					
0.968** (0.394)	2.462** (0.967)	-4.586* (2.667)			26,983
<i>Panel G: IV-Heckit method; aggregate PEE; aggregate academic pressure</i>					
0.854** (0.347)			15.019** (7.077)		26,983
	2.571*** (0.872)	-5.212** (2.561)	13.669* (8.078)		26,983
<i>Panel H: PSM-DID estimations of ATT</i>					
				0.307*** (0.116)	17,638
<i>Panel I: SDID estimations of ATT</i>					
				0.232*** (0.086)	17,526

Note: Standard errors are in parentheses. *p < 0.1, ** p < 0.05, *** p < 0.01.

4.4 Underlying mechanisms

To identify the mechanisms through which PEE may influence adolescent SWB, we begin by estimating the PEE effect on three important dimensions: the adolescent's (i) family resources, (ii) family relationships, and (iii) aspirations. Because PEE is generally associated with parental investment (e.g., money, time, energy) in their offspring (Downey, 1995), we argue that parents who place higher expectations on their children are more likely to provide them with a positive learning environment, which in turn may have a beneficial impact on adolescent SWB. In addition, as stressed by Becker and Lewis (1973), the tradeoff between child quantity and child

quality implies that parents with high educational expectations for their offspring may have fewer children to avoid resource dilution. In fact, our results do reveal that PEE is positively associated with the likelihood of having extracurricular books, desks, and computers in the home but negatively correlated with number of siblings (Table 7, Panel A). These findings imply that one pathway through which PEE may affect adolescent SWB is improvement in family resources.

Table 7 PEE effect on intermediate factors

	Parental educational expectations			
	Pooled-OLS (1)	RE (2)	2SLS (3)	RE-IV (4)
<i>Panel A: Family resources</i>				
Many extracurricular books in the home	0.069*** (0.006)	0.055*** (0.006)	1.378*** (0.078)	1.329*** (0.114)
Observations	28,499	28,499	26,784	26,784
Desk in the home	0.033*** (0.005)	0.031*** (0.005)	0.475*** (0.044)	0.495*** (0.049)
Observations	28,499	28,499	26,784	26,784
Computer in the home	0.007 (0.005)	0.003 (0.004)	0.704*** (0.051)	0.692*** (0.071)
Observations	28,499	28,499	26,784	26,784
Number of siblings	-0.030** (0.014)	-0.017 (0.013)	-0.968*** (0.209)	-0.907*** (0.268)
Observations	12,823	12,823	12,398	12,398
<i>Panel B: Family relationships</i>				
Spousal relationship	0.011** (0.005)	0.011** (0.005)	0.091** (0.038)	0.091** (0.038)
Observations	28,499	28,499	26,784	26,784
Emotionally close to the mother	0.061*** (0.006)	0.055*** (0.006)	0.292*** (0.047)	0.317*** (0.052)
Observations	28,499	28,499	26,784	26,784
Emotionally close to the father	0.055*** (0.006)	0.047*** (0.006)	0.344*** (0.052)	0.366*** (0.060)
Observations	28,499	28,499	26,784	26,784
<i>Panel C: Adolescent aspirations</i>				
Adolescent's own expectations for the future	0.044*** (0.005)	0.037*** (0.005)	0.240*** (0.038)	0.260*** (0.042)
	28,499	28,499	26,784	26,784

Note: Standard errors are in parentheses. *p < 0.1, ** p < 0.05, *** p < 0.01.

One means of motivating action toward the achievement of educational expectations is to set aspirational goals (Markus & Nurius, 1986), goals whose levels need not inherently depend on family resources. Nonetheless, parents with higher aspirations for their children may be more motivated to provide a harmonious home environment (especially good family relationships) to promote healthy development. Given that good family relationships are generally conducive to child SWB (Amato & Afifi, 2006), it is plausible to assume that family relationships are a potential channel through which PEE operates on adolescent SWB. To test this assumption, we examine the effect of PEE on three emotional linkages that measure familial harmony: spousal relationships, mother-child relationships, and father-child relationships. We find that PEE does indeed have a significantly positive impact on all three familial ties (Table 7, Panel B), implying that PEE may influence adolescent SWB via improvements in family relationships. As to whether PEE contributes to the adolescents' own hopes for the future, which may further affect their SWB indirectly (see, e.g., Eryilmaz, 2011), we observe a significantly positive association between PEE and adolescent aspirations (Table 7, Panel C), suggesting these latter as another potential conduit for PEE's observed beneficial effect on adolescent SWB.

5 Conclusions

Despite growing research attention to PEE's beneficial impacts on child development, the evidence for a causal relation between PEE and adolescent SWB is scant, especially for developing countries like China. Our analysis of two waves of nationally representative CEPS data begins filling this void by exploiting PEE's heterogeneous effects to confirm its linkage

with adolescent SWB, assess the moderating effect of adolescent-perceived academic pressure, and explore the potential mechanisms through which PEE may operate.

Our study results not only provide robust evidence that PEE has a significantly positive effect on adolescent SWB, they also confirm that adolescent-perceived academic pressure significantly attenuates this linkage. Interestingly, however, although the positive benefits of PEE and the negative moderation of perceived academic pressure are both greater for students from immigrant, one-child, and nonpoor families, the former are more positive for girls and the latter more negative for boys. As regards the underlying mechanisms, we find that the effect of PEE on adolescent SWB may operate through improvements in family resources and family relationships, as well as through the raising of the adolescents' own aspirations. Taken together, these results provide convincing evidence that increasing PEE can have a beneficial effect on child well-being.

Yet despite this potential benefit, policies that help parents form such expectations are both few and difficult to formulate and implement. One exception is the child savings account (CSA), which provides children and families with an initial seed deposit to incentivize asset accumulation. CSAs also incorporate matching funds and motivators that add public or philanthropic funds to family savings in order to extend meaningful savings incentives, support balance-building among lower income savers, and parallel the supports already available to higher income households through tax benefits (Woo et al., 2010). According to a randomized control trial by SEED for Oklahoma Kids (SEED OK), parents given CSAs not only had higher expectations for their children (aged birth through four) but these expectations were more likely to remain constant or increase during the study period than those of controls receiving no CSAs,

most especially among the poorest families (Kim et al., 2015). Rauscher et al. (2017) provide similar evidence of a positive relation between PEE and exposure to the community-based Promise Indiana children's savings account, although their results differ by parental income and education. That is, not only were parents awarded CSAs or exposed to additional program motivators (e.g., college and career focused classroom activities, trips to university campuses) more likely to expect their elementary school-age children to attend college, but this tendency was three times stronger when both parents received the additional exposure and 13 times greater when these latter had no college education (Rauscher et al., 2017).

Yet although programs such as CSAs are effective for PEE formation, one important challenge to all such policies is that the expectations produced be *realistic*. In practice, information asymmetry between children and parents may make it difficult for some parents to accurately evaluate their children's potential. One possible remedy for this asymmetry is for schools to invite parents to nonacademic seminars or peer-group interventions that facilitate parent-teacher communication, which could in turn help parents form more realistic expectations for their children's educational achievement.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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