



# Parental factors and adolescent well-being: Associations between developmental trajectories

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## ABSTRACT

**Objectives:** This study examined the associations between developmental trajectories of parenting and adolescent well-being. The moderating effect of child gender was also explored.

**Method:** The participants were 3,328 Hong Kong Chinese adolescents (52.1% boys, mean age = 12.59 years at baseline) who responded to questionnaires measuring their perceptions of parenting and well-being every year during the six-year high school period.

**Results:** Latent growth curve modeling revealed that trajectories of positive parental factors (behavioral control and parent–child relationship) positively predicted trajectory of life satisfaction, but negatively predicted hopelessness trajectory, indexed by intercept–intercept and slope–slope associations. Reverse associations were found for psychological control. Child gender mainly moderated the influence of psychological control, with the associations appearing to be slightly stronger for girls than for boys.

**Conclusion:** These findings add evidence that there may be long-term parental impacts on children's well-being and highlight the importance of looking at related developmental trajectories involved.

## 1. Introduction

Extensive studies have been conducted on adolescent well-being, which mainly points to how well an individual's life is in broad areas such as physical health, financial safety, emotional happiness, interpersonal relationships, fulfillment in family, community, and society (OECD, 2013). In the scientific literature, life satisfaction and hopelessness are two salient measures of well-being, with the former representing an individual's cognitive appraisal of his or her life as a whole (Diener et al., 2012) and the latter referring to negative views toward or loss of hope about one's life and future (Beck et al., 1974). While high life satisfaction indicates attainment of pleasure and fulfillment of developmental needs, which is associated with positive thinking style and strategies in dealing with challenges (Fredrickson, 2001; Park, 2004), a feeling of hopelessness indicates adolescents' expectations for a gloomy future. Such a negative experience has been found to be associated with negative developmental outcomes (e.g., depression and suicide) among adolescents (Liu et al., 2015; Mac Giollabhui, Hamilton, et al., 2018). Rich empirical findings supported this notion by revealing close relationships between life satisfaction as well as hopelessness and youth functioning as well as psychopathology, such as depression and

suicidal behavior (e.g., Heffner & Antaramian, 2016; Li et al., 2016; Mac Giollabhui, Hamilton, et al., 2018; Moksnes et al., 2016; Zhou et al., 2020).

According to the ecological framework of adolescent development (Lerner & Castellino, 2002), adolescent well-being is shaped by individual-context interactions at different levels, including family, school, community, and society. Seligman and Csikszentmihalyi (2014) also highlights that positive experience in interacting with living environment cultivates adolescents' positive well-being. For example, family and school serve as two important socialization systems where adolescents form meaningful interactions with parents, siblings, teachers, and peers, which are all essential for adolescent well-being. Positive parent–child interactions characterized by parental involvement, support, and responsiveness are associated with greater well-being among adolescents (Leung & Shek, 2020; Raboteg-Saric & Sakic, 2014). Likewise, there is also a close linkage between better adolescent well-being and positive school environment in terms of teacher support, peer acceptance, and positive peer relationships (e.g., Birkeland et al., 2014; Suldo et al., 2013).

Among these contextual factors, family has been regarded as the primary socialization system that exerts an immediate and direct

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influence on children's development (Lerner & Castellino, 2002; Shek et al., 2021). In particular, parents' child-rearing strategies and their interactions with children significantly shape the development of children's well-being (Proctor et al., 2009; Willroth et al., 2020). Research findings in different cultures have demonstrated that adolescents whose parents exercise positive parenting characterized by support, concern, responsiveness, active communication, mutual trust, and/or behavioral control reported higher levels of life satisfaction and lower levels of hopelessness than did their counterparts whose parents exert psychological control, neglect, harshness, and/or other dysfunctional parenting tactics (Lai Kwok & Shek, 2010; Leung & Shek, 2020; Li et al., 2016; van der Kaap-Deeder et al., 2017; Zhu & Shek, 2020).

Although the studies cited above empirically demonstrated parental impacts on adolescent well-being, most of them only focused on the level of well-being while ignoring its developmental trajectories over time. Adolescents' well-being is arguably volatile, given the considerable challenges and life stress they face during adolescence. For instance, Goldbeck et al. (2007) observed a decreasing trend in adolescent life satisfaction, and Stoddard et al. (2011) identified an upward trend in hopelessness among some adolescents. Shek and Liang (2018) also found life satisfaction declined while hopelessness increased among Hong Kong Chinese adolescents. However, a study found life satisfaction increased (Yoo et al., 2017), and another study reported a general decline in hopelessness (Mac Giollabhui, Nielsen, et al., 2018) across adolescence. Given the mixed findings, it is important to identify the predictors of individual variability in adolescent well-being. One possibility is that positive parenting as an indicator of a favorable socialization environment may buffer the negative influence of adjustment challenges and life stress during the transition period, thus protecting adolescent well-being against a fast decline. However, empirical studies testing this argument are not widespread.

Few exceptions are noted. For example, Shek and Liang's (2018) study found that lower initial mother-child subsystem quality indicated by maternal parenting practice and quality of mother-child relationship predicted a slower drop in adolescent life satisfaction, and a poorer initial family functioning predicted a slower increase in adolescent hopelessness. Yoo et al. (2017) also found that a better relationship with parents predicted a slower increase in children's life satisfaction. Such findings contrasted with the general expectation, and the authors conjectured that it might be attributable to a floor or ceiling effect. In fact, as these studies considered parental influence in terms of an aggregated parental indicator instead of individual parent-child relational quality, it is possible that different parental factors, such as behavioral and psychological control, may exert different influences. For example, in Zhu and Shek's (2020) study, while behavioral control and parent-child relationship significantly predicted adolescent life satisfaction in one year, psychological control did not. In addition, parental impacts may differ by child gender, which was not considered in the two studies. For instance, as parental behavior control provides guidelines and standards for proper conduct, it may be more influential on boys as they tend to report higher levels of behavioral problems (Lyons et al., 2014; Pinguart, 2017). On the other hand, psychological control may be more detrimental to girls as they often report higher levels of emotional distress (Moksnes et al., 2016; Rudolph, 2002) and are expected to be more emotionally sensitive and vulnerable to psychological distance from their parents (Leung & Shek, 2020; Van Lissa et al., 2019). As such, there is a need to further understand parental impacts on the changes in adolescent life satisfaction and hopelessness by considering different parental factors and child gender.

Furthermore, none of the studies have considered changes in parental factors over time when investigating parental impacts on adolescent development. This may help explain why some studies did not find significant longitudinal parental impacts. For example, in Saha et al.'s (2010) study, parental support, behavioral control, and autonomy granting were not significant predictors of adolescent life satisfaction after one year. Parental strategies may change over time.

Theoretically, adolescent children become more independent and have a growing need for autonomy, which may lead to changes in parenting strategies and parent-child relationships. For instance, adolescents tend to spend more time with peers and are less willing to disclose themselves, making it more difficult for parents to monitor their children's daily lives, and thus parental behavioral control gradually decreases over time (Hamza & Willoughby, 2011). In addition, the desire for independence and autonomy may result in more parent-child conflicts and mutual dissatisfaction with each party, which leads to deteriorated relationships between parents and adolescents (Shanahan et al., 2007). Indeed, two recent multi-wave longitudinal studies using univariate latent growth curve modeling revealed the expected developmental trajectories in different parental factors, such as behavioral control, support, and parent-child relationship (Mastrotheodoros et al., 2019; Shek & Dou, 2020). Such changes in parenting call for a better understanding of parental impacts by investigating the associations between developmental trajectories in parental factors and adolescent well-being.

In view of these research gaps, our study aimed to examine 1) how developmental trajectories in parental factors are associated with developmental trajectories in adolescent life satisfaction and hopelessness, and 2) whether the associations are differed by child gender. Three parental factors that constitute essential aspects of the family process were considered, including behavioral control, psychological control, and parent-child relationship (Zhu & Shek, 2020). Parental behavioral control is commonly conceived as a functional strategy that aims to regulate children's behavior through monitoring and setting rules and boundaries (Barber et al., 2005). In contrast, psychological control is intrusive parenting that aims to manipulate children's thoughts, feelings, and emotions through shaming, guilt induction, and love withdrawal (Barber et al., 2005). Parent-child relationship refers to the quality of interactions between parents and children as well as the extent to which children are satisfied with parental socialization (Shek & Zhu, 2019).

Empirical findings have documented the general positive nature of behavioral control and parent-child relationship as well as the negative nature of psychological control, as reflected in their associations with the levels of adolescent developmental outcomes (Leung & Shek, 2020; Rothenberg et al., 2020; van der Kaap-Deeder et al., 2017; Zhu & Shek, 2020). Thus, we expected that trajectories of behavioral control and parent-child relationship would be positively associated with the developmental trajectory of life satisfaction (Hypothesis 1a and Hypothesis 1b) while negatively associated with the developmental trajectory of hopelessness (Hypothesis 1c and Hypothesis 1d). For example, intercept and linear slope of parental behavioral control were expected to be positively associated with intercept and linear slope of adolescent life satisfaction, indicating a faster decrease in parental behavioral control would be associated with a faster decrease in adolescent life satisfaction. On the contrary, the developmental trajectory of psychological control was expected to negatively predict the developmental trajectory of life satisfaction (Hypothesis 2a) while positively predict the developmental trajectory of hopelessness (Hypothesis 2b). To test the potential moderating effect of child gender, all these hypotheses were tested using multi-group comparisons (girls vs. boys). Given the limited research findings in this field, we explored child gender effect without making any prior hypotheses. Similar to previous studies, family demographic variables (i.e., economic status and family intactness) were considered as time-invariant control variables as they may affect adolescent well-being (Antaramian, Huebner, & Valois, 2008; Shek & Liang, 2018).

## 2. Methods

### 2.1. Participants and procedures

Grade 7 students in twenty-eight local Chinese secondary schools in

different districts in Hong Kong were invited to join a longitudinal project in which adolescents were surveyed annually during their high school period (Grade 7 to 12) regarding their psychosocial adjustment and associated antecedents. At Wave 1, a total of 3,328 adolescents (mean age = 12.59 ± 0.74 years; 52.1% boys) completed the survey. This sample showed demographic characteristics comparable to the general Grade 7 Chinese adolescent population in Hong Kong at the same year (i.e., mean age = 12.04 years, 52.5% boys) (Education Bureau, 2010).

Among the 3,328 students, 2,905, 2,860, 2,684, 2,474, and 2,385 completed the same survey in the succeeding five waves of data collection. Sample attrition was attributable to the following reasons: some students were absent from school when we collected data, some students had transferred to another school, some had withdrawn from school, and some decided not to respond to the follow-up surveys. Attrition analyses for one wave were conducted between students having completed data (Sample A) and those not responding to the survey (Sample B) at the respective wave. At Wave 2, compared with Sample A, students in Sample B were slightly older (mean difference in baseline age = 0.17,  $t = 3.75, p < .001$ , Hedge's  $g = 0.23$ ), comprised of a higher proportion of boys (Chi-square = 34.75,  $p < .001, \phi = 0.10$ ). But the two samples did not show significant differences in family economic status and intactness. Regarding baseline parental factors and adolescent life satisfaction and hopelessness, the two samples had no significant differences in father's and mother's behavioral control, father-child relationship, and life satisfaction. However, slightly better mother-child relationship, lower levels of father's and mother's psychological control, and lower hopelessness were reported by the students in Sample A as compared to Sample B ( $F$  values varied between 7.47 and 25.86,  $ps < 0.01$ ,  $\eta^2_p$  ranged between 0.002 and 0.008). Attrition analyses yielded similar findings at later assessment occasions. As the effect sizes of the differences were not large, attrition was not a major bias in this study. At each wave, there were also small proportions (0.04%–5.58%) of incomplete data that were not related to attrition. Based on these figures, we regarded missing data in the present study were "missing at random" (Rubin, 1976).

Ethical approval was obtained from the "Human Subjects Ethics Subcommittee" at the authors' institution. Participating schools, as well as students and their parents, also gave their written consent. Prior to each occasion of data collection, participants were explained the principles of volunteer participation, free withdrawal without any consequences, anonymity, and confidentiality of the information they provided. Students completed the survey in a paper-and-pencil manner in a quiet classroom with the presence of a trained research assistant.

The data collected in this project have been utilized to address different research questions, such as associations among parental factors and adolescent problem behavior (Shek & Zhu, 2019; Zhu & Shek, 2020) and the developmental trajectories of parental factors and adolescent well-being (Shek & Dou, 2020; Shek & Liang, 2018). While the team's prior work has documented developmental trajectories in parenting and adolescent well-being separately using univariate latent growth curve modeling, the present study aimed to address new research questions. Specifically, this study examined how the developmental trajectories in parenting predict the developmental trajectories of adolescent well-being and whether the associations are moderated by child gender. Therefore, the foci of the present study are different from those in previous studies. Table 1 summarizes what had been done in prior work and the related limitations that were further addressed in this study.

## 2.2. Measures

### 2.2.1. Parent factors

Parental factors were measured by a validated indigenous scale entitled "Parent-Child Subsystem Quality Scale", which included two 17-item subscales for paternal factors and maternal factors, respectively (Shek & Law, 2016). In each subscale, seven items assessed behavioral

**Table 1**

Summaries of research questions addressed in prior work and limitations addressed in the present study using the same data set.

Related work based on the 6-year dataset	Research method	Research objectives	Limitations
Shek and Liang (2018)	Univariate Latent Growth Curve Modeling	1. Examine developmental trajectories of adolescent well-being (life satisfaction and hopelessness) 2. Explore predictive effects of baseline (i.e., Wave 1) internal assets (e.g., resilience) and external assets (e.g., family functioning, aggregated parenting) on the developmental trajectories	1. Did not distinguish between different parental factors 2. Did not consider changes in parental factors over time – how changes in different parental factors over time may predict changes (i.e., developmental trajectories) of adolescent well-being? 3. Did not conduct multi-group comparisons across child gender (boys vs. girls)
Shek and Dou (2020)	Univariate Latent Growth Curve Modeling	1. Examine developmental trajectories of different parental factors (e.g., behavioral control and psychological control) 2. Compare differences between paternal and mother factors	1. Did not examine the influence of parental factors on adolescent well-being 2. Did not conduct multi-group comparisons across child gender (boys vs. girls)
The present study	Multivariate Latent Growth Curve Modeling	1. Examine associations between developmental trajectories of different parental factors and changes in adolescent well-being 2. Explore the moderating effect of child gender on the associations between changes in parental factors and changes in adolescent well-being	The present study focused on different research questions and addressed the above limitations

control (e.g., "My father/mother asked me about what I did after school" and "my father/mother expects me to have good behavior in school"), four items assessed psychological control (e.g., "Father/mother often wants to change my mind or feelings for things"), and the final six items assessed parent-child relationship (e.g., "My father's/mother's discipline of me is reasonable" and "I shared my feelings with my father/mother"). Respondents indicated the extent to which they agreed with each statement from "1" ("strongly disagree") to "4" ("strongly agree"). Cronbach's alpha and McDonald's omega estimates of all subscales were above 0.80 at all waves (see Table 2).

### 2.2.2. Life satisfaction

The five-item translated Chinese version of the "Satisfaction with Life Scale" was employed to assess adolescents' overall perceptions of the quality of their lives (Diener et al., 1985; Shek, 2004). A six-point reporting scale (1 = "strongly disagree", 6 = "strongly agree") was

**Table 2**  
Descriptive statistics of key variables and reliability analyses of measures at six waves.

N	Mean (SD)						Reliability Cronbach's alpha (McDonald's omega)					
	W1	W2	W3	W4	W5	W6	W1	W2	W3	W4	W5	W6
Total	3,328	2,905	2,860	2,684	2,574	2,385						
Male	1,735	1,445	1,433	1,336	1,200	1,161						
Female	1,584	1,419	1,407	1,338	1,265	1,218						
<b>Parental factors</b>												
FBC	2.56 (0.65)	2.54 (0.62)	2.51 (0.60)	2.50 (0.58)	2.47 (0.56)	2.45 (0.57)	0.89 (0.89)	0.89 (0.89)	0.89 (0.89)	0.89 (0.89)	0.88 (0.89)	0.89 (0.89)
FPC	2.24 (0.67)	2.25 (0.69)	2.19 (0.71)	2.18 (0.69)	2.16 (0.65)	2.17 (0.69)	0.80 (0.81)	0.83 (0.84)	0.86 (0.87)	0.86 (0.87)	0.85 (0.86)	0.88 (0.88)
FCRQ	2.81 (0.66)	2.78 (0.65)	2.76 (0.64)	2.74 (0.61)	2.73 (0.61)	2.72 (0.60)	0.90 (0.90)	0.91 (0.91)	0.90 (0.90)	0.90 (0.90)	0.90 (0.90)	0.91 (0.90)
MBC	3.04 (0.60)	2.97 (0.58)	2.92 (0.56)	2.91 (0.54)	2.87 (0.54)	2.85 (0.52)	0.90 (0.90)	0.89 (0.90)	0.89 (0.89)	0.88 (0.88)	0.88 (0.88)	0.87 (0.87)
MPC	2.28 (0.75)	2.28 (0.74)	2.23 (0.74)	2.21 (0.72)	2.20 (0.70)	2.20 (0.71)	0.85 (0.86)	0.88 (0.88)	0.89 (0.89)	0.89 (0.90)	0.90 (0.90)	0.91 (0.91)
MCRQ	3.07 (0.65)	2.98 (0.63)	2.97 (0.59)	2.96 (0.56)	2.94 (0.56)	2.94 (0.54)	0.91 (0.91)	0.91 (0.91)	0.90 (0.90)	0.90 (0.90)	0.90 (0.90)	0.89 (0.89)
<b>Well-being</b>												
LS	3.97 (1.05)	3.85 (1.06)	3.79 (1.03)	3.71 (1.04)	3.59 (1.02)	3.59 (1.05)	0.85 (0.85)	0.87 (0.87)	0.87 (0.86)	0.88 (0.87)	0.88 (0.87)	0.88 (0.88)
HL	2.59 (1.11)	2.66 (1.09)	2.64 (1.08)	2.63 (1.05)	2.69 (1.06)	2.67 (1.06)	0.85 (0.85)	0.87 (0.87)	0.87 (0.87)	0.88 (0.88)	0.89 (0.89)	0.89 (0.89)

Note. W1 = Wave 1, W2 = Wave 2, W3 = Wave 3, W4 = Wave 4, W5 = Wave 5, W6 = Wave 6, FBC = father's behavioral control, FPC = father's psychological control, FCRQ = father – child relationship quality, MBC = mother's behavioral control, MPC = mother's psychological control, MCRQ = mother – child relationship quality, LS = life satisfaction, HL = hopelessness.

used. Cronbach's alpha and McDonald's omega estimates ranged between 0.85 and 0.88 (see Table 2).

2.2.3. Hopelessness

Hopelessness was measured by the “Chinese Hopelessness Scale” (Shek, 1993). This scale contained five items that were translated and modified from the “Hopelessness Scale” developed by Beck et al. (1974). The participants reported the extent to which they agreed with the five statements (e.g., “the future seems gloomy”) from “1” (“strongly disagree”) to “6” (“strongly agree”). In this study, Cronbach's alpha and McDonald's omega values were above 0.85 across occasions (see Table 2).

2.2.4. Control variables

Two family demographic factors, including family economic status and intactness, were control variables as they were linked to adolescent

well-being (Antaramian et al., 2008; Proctor et al., 2009). Family economic disadvantage was indicated by receiving government welfare “Comprehensive Social Security Assistance” (CSSA). At Wave 1, 225 adolescents reported they were living on CSSA. Family intactness was indicated by the marital status of parents. Specifically, if parents were in their first marriage, the adolescent was considered living in an intact family. Other marital status of parents, such as divorce, separation, or remarriage, indicated non-intact families. At Wave 1, a total of 515 adolescents were in non-intact families.

2.3. Data analysis plan

Latent growth curve (LGC) modeling was used to estimate the associations between the trajectories of parental factors and adolescent well-being. As the developmental trajectories of parental factors and adolescent well-being have been separately investigated in previous

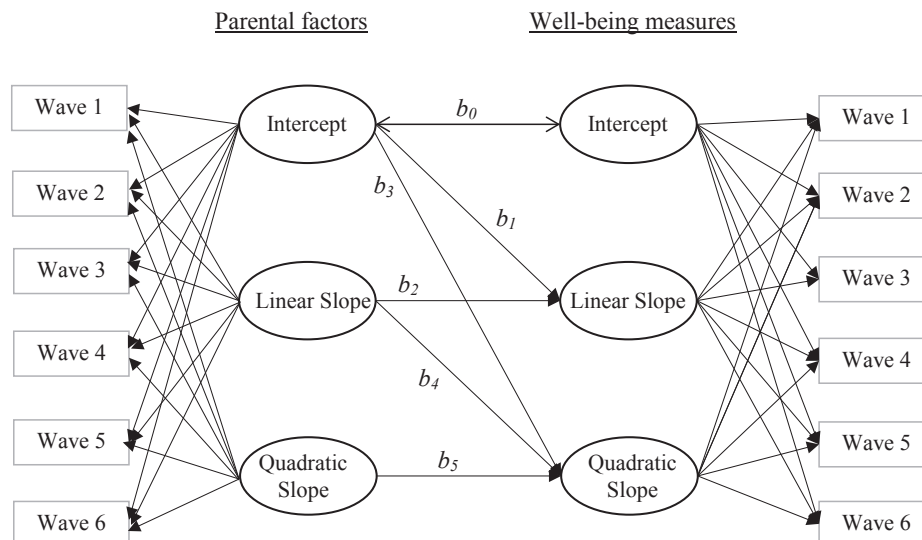


Fig. 1. Conceptual diagram of associations between latent growth curve models. Error terms and covariates were not shown in the figure.

studies using univariate latent growth curve modeling (Shek & Dou, 2020; Shek & Liang, 2018), we performed univariate LGC only for setting the basic models for further testing the associations between the trajectories (see Table 1 for comparisons between our previous work and the current study). In other words, univariate LGC was not the focus, but just the primary preparation for the multivariate LGC described later.

As shown in Fig. 1, intercept, linear and quadratic slopes were three latent variables estimated based on the six observed variables obtained at the corresponding waves. The adjacent waves were one year apart except for the last two waves, of which the average interval was ten months. The reason is that students were in Grade 12 at the final wave, and they had to sit the public examination during the last two months of their high school study. Therefore, we set the path coefficient from each observed variable to intercept as 1. The path coefficients were set as 0, 1, 2, 3, 4, and 4.83, respectively, for the linear slope, and 0, 1, 4, 9, 16, and 23.33, respectively, for the quadratic slope.

We estimated three sets of models: no growth, linear growth, and quadratic growth models. Several model indices were used to test model fit, including chi-square, CFI (“Comparative Fit Index”), NNFI (“Non-Normed fit index”), and RMSEA (“Root Mean Square Error of Approximation”) (Kline, 2015). Based on comparisons of the models based on these indices, a model that best fitted the present data was selected for each variable for further analyses. Multi-group comparisons were performed to explore if the trajectories varied depend on adolescent gender.

After setting the individual models, we performed multivariate LGC to test how the developmental trajectory of each parental factor predicted the developmental trajectories of adolescent life satisfaction and

hopelessness. There were three main predictive effects: a)  $b_0$ : the association between the initial levels (intercepts) of parental factors and well-being measures (this cross-sectional association was modeled as covariance); b)  $b_1$ : the association between the intercepts of parental factors and the linear slopes (i.e., growth rates) of well-being measures; and c)  $b_2$ : the association between the linear slopes of parental factors and well-being measures (see Fig. 1). If quadratic slopes were included in the final analyses, the predictive effects from the intercepts, linear slopes, and quadratic slopes of parental factors to the quadratic slopes of well-being measures represented by  $b_3$ ,  $b_4$ , and  $b_5$ , respectively would also be investigated (see Fig. 1).

Multi-group comparisons were performed to examine adolescent gender differences in the predictive effects. Three indices mentioned earlier, including CFI, NNFI, and RMSEA, were used to test the model fit. As some participants had incomplete data at one or more waves of assessment as illustrated in previous section, we adopted the “full information maximum likelihood” estimation method in AMOS 25.0 to handle missing data (Arbuckle, 2017). This method makes use of all available data for each case and has been proved to yield unbiased results for “missing at random” data (Acock, 2005; Cham et al., 2017).

### 3. Results

#### 3.1. Trajectories of parental factors and adolescent well-being

As previous studies have documented the related trajectories (Shek & Dou, 2020; Shek & Liang, 2018), we only briefly reported the findings,

**Table 3**  
Trajectories of parental factors and adolescent well-being measures over time.

	Model fit					Intercept		Linear slope		Quadratic slope		
	Chi-square	df	CFI	NNFI	RMSEA	Mean	Variance	Mean	Variance	Mean	Variance	
Father's behavioral control												
No growth model	462.793	19	0.931	0.946	0.107							
Linear growth model	80.264	16	0.990	0.991	0.045							
Quadratic growth model	33.581	12	0.997	0.996	0.030	2.56***	0.29***	-0.02**	0.04**	0.0004	0.001***	
Father's psychological control												
No growth model	363.177	19	0.912	0.930	0.095							
Linear growth model	104.689	16	0.977	0.979	0.052	Male	2.34***	0.18***	-0.03**	0.04***	0.003	0.002**
Quadratic growth model	60.670	12	0.988	0.984	0.045	Female	2.16***	0.21***	-0.03**	0.04***	0.003	0.001**
Father-child relationship quality												
No growth model	548.484	19	0.919	0.936	0.271							
Linear growth model	129.940	16	0.983	0.984	0.059							
Quadratic growth model	33.967	12	0.997	0.996	0.030	2.81***	0.28***	-0.03***	0.05***	0.002	0.002***	
Mother's behavioral control												
No growth model	624.308	19	0.892	0.914	0.126							
Linear growth model	111.335	16	0.983	0.984	0.054							
Quadratic growth model	34.444	12	0.996	0.995	0.030	3.04***	0.22***	-0.06***	0.04***	0.001	0.001***	
Mother's psychological control												
No growth model	319.382	19	0.921	0.937	0.088							
Linear growth model	64.199	16	0.987	0.988	0.039	Male	2.34***	0.29***	-0.03**	0.06***	0.003	0.002***
Quadratic growth model	26.784	12	0.996	0.995	0.024	Female	2.24***	0.28***	-0.03**	0.05***	0.003	0.002***
Mother-child relationship quality												
No growth model	564.613	19	0.902	0.922	0.119							
Linear growth model	132.449	16	0.979	0.980	0.060							
Quadratic growth model	42.746	12	0.994	0.993	0.036	3.06***	0.28***	-0.06***	0.05***	0.01**	0.001***	
Life satisfaction												
No growth model	890.120	19	0.844	0.877	0.151							
Linear growth model	133.024	16	0.979	0.980	0.060							
Quadratic growth model	44.553	12	0.994	0.993	0.037	3.97***	0.73***	-0.11***	0.16***	0.01*	0.01***	
Hopelessness												
No growth model	443.137	19	0.906	0.926	0.105							
Linear growth model	159.971	16	0.968	0.970	0.067	Male	2.70***	0.69***	0.03*	0.16***	-0.003	0.006***
Quadratic growth model	91.105	12	0.983	0.978	0.057	Female	2.52***	0.65***	0.03*	0.16***	-0.003	0.001***

Note. Family economic status and intactness were statistically controlled. Non-poor (vs. poor) families were related to higher initial levels of father-child relationship quality and adolescent life satisfaction. Intact (vs. non-intact) families were related to higher initial levels of parental behavioral control, parent-child relationship qualities, and adolescent life satisfaction and slower declines in these measures. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

mainly the results of multi-group comparisons (girls vs. boys) that were not performed in previous studies. As shown in Table 3, the quadratic growth models fitted the data significantly better than the other two models (i.e., no growth and linear growth models) for all parental factors and well-being measures. Thus, the quadratic growth model was adopted for all measures.

Multi-group comparisons were conducted to examine whether the trajectories varied among boys and girls by constraining a) intercept (i.e., model 1), b) linear slope (i.e., model 2), and c) quadratic slope (i.e., model 3), respectively, to be equal across the two subsamples. Results indicated that constraining intercept resulted in worse model fit for paternal psychological control ( $\Delta\chi^2_{(1)} = 38.50, p < .001$ ), maternal psychological control ( $\Delta\chi^2_{(1)} = 13.25, p < .001$ ), and adolescent hopelessness ( $\Delta\chi^2_{(1)} = 7.43, p = .006$ ), but not for other measures ( $\Delta\chi^2_{(1)}$  varied between 0.23 and 2.71,  $p$  ranged between 0.10 and 0.63). Furthermore, constraining linear or quadratic slopes did not result in significant changes in model fit as compared to the unconstrained model for all measures ( $\Delta\chi^2_{(1)}$  varied between 0.02 and 2.97,  $p$  ranged between 0.08 and 0.89). Thus, for parents' psychological control and adolescent hopelessness, trajectories were calculated by freely estimating intercepts and constraining linear and quadratic slopes to be equal across adolescent gender. For other parental factors and adolescent life satisfaction, the trajectories were estimated by combining the two subsamples (i.e., using the whole sample).

As shown in Table 3, there were gradual declines in the levels of parents' behavioral and psychological control, parent-child relationship quality, and adolescent life satisfaction. In addition, a slight increase trend was observed for adolescent hopelessness. Furthermore, small quadratic slopes were observed for mother-child relationship quality and life satisfaction but not for other measures. As for the child gender effect, boys reported higher initial levels of parental psychological control and hopelessness than girls.

### 3.2. Relationship between trajectories of parental factors and adolescent well-being

We performed multivariate LGC to examine the associations between trajectories of parental factors and adolescent well-being. In each multivariate LGC analysis, one parental factor and one adolescent well-being measure were included. As quadratic changes were not significant or only minimal (for mother-child relationship and life satisfaction), quadratic slopes were not considered in the multivariate LGC analyses for parsimony. As suggested by scholars (Robitaille et al., 2012), it is often complicated to interpret associations between two trajectories if quadratic slopes are modeled and additional analyses may be needed to understand the results as there may be "high collinearity between linear and quadratic temporal metrics" (p. 6). Similar to previous studies (Robitaille et al., 2012; Shek & Lin, 2017), we used linear-only models to save space for illustrating more details on the linear models and simplify interpretations of the results. As this may have implications for the associations between the trajectories of parental factors and adolescent well-being, future research would be warranted to further address the complications result from modeling nonlinear slopes.

Based on the above justification, the predictive effects marked as  $b_0$ ,  $b_1$ , and  $b_2$  were examined. First, we conducted multi-group comparisons (boys vs. girls) by constraining one predictive effect (i.e.,  $b_0$ ,  $b_1$ , or  $b_2$ ) each time to examine whether there was any significant child gender effect. Based on the results of univariate LGC analyses, in the multi-group comparisons of multivariate LGC, the intercepts of parental psychological control and adolescent hopelessness were freely estimated. In contrast, the intercepts of other measures and linear slopes of all measures were constrained to be equal across the two subsamples.

For parental behavioral control and parent-child relationship quality, constraining either one predictive effect did not result in significant changes in model fit as compared to the unconstrained model ( $\Delta\chi^2_{(1)}$  ranged between 0.004 and 3.26,  $p$  ranged between 0.95 and 0.07).

Therefore, in the final analyses, the predictive effects were estimated based on the whole sample with child gender controlled as a covariate. However, for the models involving parental psychological control and adolescent life satisfaction, constraining  $b_0$  or  $b_1$  lead to a worse model fit ( $\Delta\chi^2_{(1)}$  ranged between 10.80 and 12.22,  $p$  ranged between 0.001 and 0.007). Therefore, the final analyses were performed by freely estimating  $b_0$  and  $b_1$  while constraining  $b_2$  to be equal across adolescent gender. As for the models involving parental psychological control and adolescent hopelessness, constraining  $b_1$  resulted in a worse model fit ( $\Delta\chi^2_{(1)}$  ranged between 5.85 and 6.87,  $p$  ranged between 0.02 and 0.009). Thus, the final analyses were performed by freely estimating  $b_1$  while constraining  $b_0$  and  $b_2$  to be equal across child gender. In all final multivariate LGC analyses, family economic status and intactness were statistically controlled. As shown in Table 4, all the final models demonstrated good model fit.

Results of the predictive effects based on the final models are also presented in Table 4. First, the initial levels of parental behavioral control and parent-child relationship were positively and negatively associated with the initial levels of adolescent life satisfaction and hopelessness, respectively. In contrast, the initial levels of parental psychological control were negatively and positively associated with the initial levels of adolescent life satisfaction and hopelessness, respectively. These findings are consistent with our hypotheses. In addition, for life satisfaction, the negative association with psychological control seemed greater among girls (father:  $r = -0.25, p < .001$ ; mother:  $r = -0.27, p < .001$ ) than that among boys (father:  $r = -0.09, p = .02$ ,  $Z_{\text{difference}} = 4.88, p < .001$ ; mother:  $r = -0.11, p = .002$ ,  $Z_{\text{difference}} = 4.92, p < .001$ ).

Second, the initial levels of maternal behavioral control ( $\beta = -0.13, p < .001$ ) and father-child relationship ( $\beta = -0.11, p = .003$ ) negatively predicted the linear slope of adolescent life satisfaction, suggesting that higher initial levels of maternal behavioral control and father-child relationship predicted a faster drop in adolescent life satisfaction. In addition, the initial levels of both paternal and maternal psychological control negatively predicted the linear slope of adolescent hopelessness, indicating that higher initial levels of parental psychological control predicted a slower increase in adolescent hopelessness. These results are unexpected and just opposite to our hypotheses. Besides, such effects of parental psychological control appeared stronger among girls (father:  $\beta = -0.18, p < .001$ ; mother:  $\beta = -0.16, p < .001$ ) than that among boys (father:  $\beta = -0.13, p < .001$ ,  $t_{\text{difference}} = 53.13, p < .001$ ; mother:  $\beta = -0.12, p = .003$ ,  $t_{\text{difference}} = 57.24, p < .001$ ).

Third, in line with our hypotheses, the linear slopes of parental behavioral control and parent-child relationship positively and negatively predicted the linear slopes in adolescent life satisfaction and hopelessness, respectively. In contrast, the slopes of parental psychological control negatively and positively predicted the linear slopes of adolescent life satisfaction and hopelessness, respectively. These results suggested that when parents' behavioral control or parent-child relationship declined at a slower rate, or parents' psychological control decreased at a faster rate, their children's life satisfaction and hopelessness declined and increased, respectively, at a slower rate. In addition, the predictive effects of parental psychological control on life satisfaction and hopelessness were equivalent across child gender.

## 4. Discussion

Although ample research has documented the significance of parents in the development of their children's well-being, there is scant research examining how changes in parental factors predict changes in adolescent well-being over time. The aim of this study was to fill this research gap by investigating the relationship between developmental trajectories of parental factors and adolescent well-being (i.e., life satisfaction and hopelessness) over six years. Besides, the current study explored the moderating effect of child gender on the associations. The present findings add value to the field by delineating not only cross-sectional

**Table 4**  
Associations between trajectories of parental factors and adolescent well-being.

Model	Model fit			$b_0$			$b_1$			$b_2$		
	CFI	NNFI	RMSEA	Estimate	SE	r	B	SE	$\beta$	B	SE	$\beta$
FBC predicted LS <sup>#</sup>	0.957	0.946	0.054	0.18	0.01	0.45***	-0.02	0.01	-0.06	0.57	0.08	0.31***
MBC predicted LS <sup>#</sup>	0.955	0.944	0.053	0.15	0.01	0.41***	-0.05	0.01	-0.13***	0.54	0.09	0.28***
FCRQ predicted LS <sup>#</sup>	0.946	0.932	0.062	0.21	0.01	0.53***	-0.03	0.01	-0.11**	0.58	0.07	0.35***
MCRQ predicted LS <sup>#</sup>	0.934	0.917	0.066	0.18	0.01	0.46***	-0.02	0.01	-0.06	0.65	0.07	0.39***
FPC predicted LS <sup>^</sup>	0.972	0.965	0.028									
Male				-0.03	0.01	-0.09*	0.01	0.01	0.02	-0.31	0.07	-0.19***
Female				-0.09	0.01	-0.25***	0.02	0.01	0.07	-0.31	0.07	-0.18***
MPC predicted LS <sup>^</sup>	0.971	0.965	0.029									
Male				-0.05	0.02	-0.11**	0.01	0.01	0.02	-0.29	0.07	-0.20***
Female				-0.11	0.02	-0.27***	0.02	0.01	0.07	-0.29	0.07	-0.20***
FBC predicted HL <sup>#</sup>	0.974	0.967	0.040	-0.11	0.01	-0.29***	0.01	0.01	0.03	-0.20	0.08	-0.10*
MBC predicted HL <sup>#</sup>	0.970	0.962	0.041	-0.10	0.01	-0.28***	0.02	0.01	0.05	-0.21	0.09	-0.11*
FCRQ predicted HL <sup>#</sup>	0.964	0.955	0.047	-0.15	0.01	-0.38***	0.01	0.01	0.04	-0.27	0.07	-0.16***
MCRQ predicted HL <sup>#</sup>	0.959	0.948	0.048	-0.14	0.01	-0.35***	0.01	0.01	0.04	-0.25	0.08	-0.14**
FPC predicted HL <sup>^</sup>	0.954	0.945	0.034									
Male				0.14	0.01	0.39***	-0.05	0.01	-0.13***	0.45	0.08	0.28***
Female				0.14	0.01	0.39***	-0.06	0.02	-0.18***	0.45	0.08	0.26***
MPC predicted HL <sup>^</sup>	0.947	0.935	0.037									
Male				0.16	0.01	0.40***	-0.04	0.01	-0.12**	0.52	0.07	0.36***
Female				0.16	0.01	0.40***	-0.05	0.01	-0.16***	0.52	0.09	0.35***

Note. FBC = father’s behavioral control; MBC = mother’s behavioral control; FCRQ = father-child relationship quality; MCRQ = mother-child relationship quality; FPC = father’s psychological control; MPC = mother’s psychological control; LS = life satisfaction; HL = hopelessness.  $b_0$  = the association between intercepts of parental factor and adolescent well-being;  $b_1$  = the intercept of parental factors predicted the linear slope of adolescent well-being;  $b_2$  = the linear slope of parental factors predicted the linear slope of adolescent well-being. # The models were estimated based on the whole sample with child gender statistically controlled. ^ The models were estimated based on multi-group analyses (male vs. female) where  $b_2$  was constrained to be equal across gender, while  $b_0$  and  $b_1$  were freely estimated. ~ The models were estimated based on multi-group analyses (male vs. female) where  $b_0$  was constrained to be equal across gender, while  $b_1$  and  $b_2$  were freely estimated. For all models, family economic status and intactness were statistically controlled. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

and longitudinal predictions of parental factors on the level of adolescent life satisfaction and hopelessness, but also the associations between change slopes. Several findings are highlighted below.

First, echoing previous findings (e.g., Leung & Shek, 2020; Li et al., 2016; Pérez-Fuentes et al., 2019), the significant associations between intercepts provide additional support for cross-sectional relationships between parental factors and adolescent well-being. Generally speaking, positive parenting (behavioral control and good parent-child relationship) was associated with higher life satisfaction and lower hopelessness among adolescents, whereas negative parenting (i.e., psychological control) exerted opposite predictions. It is maintained that providing behavioral regulations for and establishing a close relationship with children are conducive to the formation of children’s adaptive internal working model of “self” (e.g., I can behave well, and I am good) and “others” (e.g., parental support is available and parents can be trusted) (Li et al., 2016). These positive beliefs are, in turn, essential boosters for life satisfaction and protective factors against hopelessness. In contrast, parental psychological control interferes with children’s basic psychological needs satisfaction, intrudes on children’s psychological worlds, and hinders the development of children’s self-esteem, thus harm children’s well-being (Chew, 2016; Pérez-Fuentes et al., 2019; Soenens & Vansteenkiste, 2010). Furthermore, parental psychological control seemed to be more strongly associated with hopelessness than with life satisfaction, concerning the magnitude of standardized regression coefficients (i.e., around 0.40 versus 0.20). It is possible that psychological control is especially detrimental in ruining children’s core beliefs about self and future, causing feelings of hopelessness and even suicidal ideations (Leung & Shek, 2020; Li et al., 2016).

Second, based on the associations between intercepts and linear slopes (i.e.,  $b_1$ ), adolescents with lower initial maternal behavioral control and worse father-child relationship showed a slower decline in life satisfaction than their counterparts. Meanwhile, adolescents whose parents displayed lower psychological control showed a steeper increase in hopelessness. Similar effects have been observed in previous studies. For example, some studies found that internal developmental assets and positive parental factors were positively associated with a rapid increase

in adolescent problem behaviors (Shek & Zhu, 2018; 2019; Shek et al., 2018). One explanation is “regression to the mean” effect which caused lower levels of well-being move up to the mean level while higher levels of well-being move down to the mean in the present study. An alternative conjecture is that the floor and ceiling effects may narrow the gaps in adolescent well-being resulting from differences in these parental factors (Yoo et al., 2017). It is possible that children become less affected by their parents as they gradually mature and form other salient social relationships, such as peer relations (Suldo & Huebner, 2004).

During adolescence, adolescents become increasingly independent from their parents and spend increasingly more time with peers, and interaction experience with peers comes to play a more important role in shaping adolescent well-being and buffering parental impacts (Brown & Larson, 2009). Individual changes during adolescence such as the increasing independence, seeking of more autonomy, and the establishment of self-concepts may result in changes in family dynamics and allow adolescents to be less affected by contextual factors including their interactions with parents (Collins & Laursen, 2004; McElhaney et al., 2009). Despite all these possibilities, the effect of most parental factors examined in this study, such as the influence of psychological control on life satisfaction seems nevertheless evident over time in the present study. This echoes previous observation that interaction with parents still have its role in adolescent development despite the contextual and individual changes during adolescence (Birkeland et al., 2014; Cava et al., 2014; Laursen & Collins, 2009).

Third, the associations between linear slopes of parental factors and adolescent well-being are congruent with our expectations. Specifically, with slower decreases in positive parental factors (behavioral control and parent-child relationship), or a rapid decrease in psychological control, there was a corresponding slower decline in life satisfaction as well as a slower increase in hopelessness among adolescents. These findings reinforce the notion that positive parenting is a protective factor, while negative parenting is a risk factor for adolescent development. While the aforementioned intercept-slope associations may attenuate parental impacts in the long run, the slope-slope associations

offset such effect. It can be argued that parenting continues to be a significant shaping force of children's well-being, in spite of children's increasing independence and individuality during adolescence (Schwarz et al., 2012; Yoo et al., 2017). Indeed, gaps in the levels of adolescents' well-being attributable to parental factors have been found to present at different developmental stages, ranging from childhood to early adulthood (Chen, 2014; Gherasim et al., 2017; Leung & Shek, 2020; Schwarz et al., 2012). Nevertheless, given the changes in parental factors over time, it is still possible to observe insignificant long-term parental influence if only considering parental factors at a single time point (Saha et al., 2010). The present pioneering findings highlight the importance of treating parenting as a time-variant concept in examining parental impacts on child development.

Fourth, we found stronger cross-sectional associations between parents' psychological control and life satisfaction for girls than for boys. Stronger predictions of initial parental psychological control on the increased rate of hopelessness were also observed among girls. This is consistent with previous findings that document the more substantial influence of psychological control on girls. For example, Shek (2007) reported that paternal psychological control exerted a more vital prediction on satisfaction in one year for daughters than for sons. Leung and Shek (2020) identified the negative influence of maternal psychological control on life satisfaction only for adolescent girls, but not for boys. Girls often report greater affiliative needs and are more sensitive to emotional bonds with parents than boys; besides, girls were found to be prone to interpret negative life events (e.g., parents' psychological control) in a negative inferential style (Cyranowski et al., 2000; Hankin, 2009). Thus, girls may be more vulnerable to be thwarted by psychological control. Nonetheless, there are also findings showing no child gender effect on the influence of psychological control on depression, a concept that is closely related to hopelessness (Bleys et al., 2018). In addition, the present study did not find differences between boys and girls regarding the predictions of behavioral control and parent-child relationship.

In the scientific literature, mixed findings have been reported regarding the difference between girls and boys in parental influence on their well-being, and most studies have not identified a systematic gender effect. For example, Cava et al. (2014) reported a stronger influence of parent-child communication on life satisfaction and self-esteem for girls. Leung and Shek (2020) reported a more vital prediction of maternal behavioral control on life satisfaction for boys than for girls. Garthe et al. (2015) failed to find any significant gender effect on parental impacts on depressive symptoms regarding behavioral control and acceptance. In conjunction with the present findings, the lack of conclusive findings may suggest that gender differences might emerge when both parental factors and adolescent development indicators are assessed in specific domains, which awaits further investigation in future research.

The present findings imply that it is necessary to promote adolescent well-being by enhancing their positive interaction experience with parents. Both parents and children face challenges in adapting to changes in adolescence. On the one hand, adolescents' perceptions of negative parenting (e.g., psychological control) and unfavorable relationships with parents are associated with their own decreased well-being. It is especially important to help adolescents develop essential skills, such as emotional and communication skills, to tackle the challenges, take own responsibilities, effectively communicate with parents, and build a more constructive family relationship. Youth enhancing programs using positive youth development or social emotional learning approaches may be good choices (Durlak et al., 2015; Shek et al., 2019).

On the other hand, parents need to understand their children's changes and developmental needs during adolescence in order to have best parenting practice and enhance children's well-being. Parents' misunderstanding of children's emotions and behaviors during adolescence may result in their dysfunctional parenting such as psychological control and less involvement (Rogers et al., 2003; Zhu & Shek, 2020).

Therefore, programs and services need to be provided to help parents better understand and cope with their children's needs for self-development, independence, autonomy, and formation of other meaningful social relations. Through such training programs, parents can acquire the necessary knowledge, attitude, and skills to minimize dysfunctional parenting and promote parenting efficacy.

Although this study reports the predictive effects of parental factors on adolescent life satisfaction and hopelessness over six years, findings should be interpreted in light of several limitations. First, the primary methodological weakness of the paper is the solely reliance on self-report data from a single source (i.e., adolescents) for both parental factors and adolescent well-being, which may inflate the associations between the trajectories. For example, adolescents may perceive their parents' behaviors in a biased way based on how they feel (e.g., hopeless or satisfied). Such bias might be even worse if the adolescent experience mental illness such as depression that is associated with hopelessness. However, the mean levels of hopelessness among the adolescents were not high across waves, which may help reduce the likelihood of giving ratings in such a distorted way. Besides, although collecting data from different sources (e.g., parents) may seem methodological favorable, parents might also misreport or justify their behaviors based on their "understanding" (or misunderstanding) of children's feelings and behaviors. For example, it is also possible that parents do not think they psychologically control their child as their intention is to help the child get rid of the hopeless feelings. Some studies indeed identified a discrepancy between parents and adolescents regarding their perceptions of parenting (Mastrotheodoros et al., 2019). Yet, it can also be argued that it is adolescents' own perception of parental factors that really matters in their development. This might be one of the reasons that self-reporting from adolescents has been widely adopted as a legitimate research method in studies on adolescents (Archer et al., 2019; Massarwi et al., 2019). Nevertheless, it is also important to triangulate or compare findings based on data provided by different informants.

Second, the present study investigated one parental factor and one adolescent well-being measure in one multivariate LGC model, which did not consider the interactive effects between different parental factors and between different well-being indicators. Different parental measures may interactively shape adolescent well-being (Leung & Shek, 2020). Besides, within a broad ecological system, parental factors may further interact with other contextual factors, such as school factors and peer influence (Birkeland et al., 2014; Lampropoulou, 2018). Future research could extend the present research scope by taking into account these interactions.

Third, although we considered the predictions of parental factors on adolescent well-being, it is theoretically plausible that adolescent well-being may also shape parental behaviors. The ecological system theory emphasized the interactions between individual and his or her environment and individual development may re-build the environment (Lerner & Castellino, 2002). It is possible that parents may adjust their parenting strategies according to their children's cognitive, emotional, and behavioral development (Pinquart, 2017; Rogers et al., 2003; Zhu & Shek, 2020). Future studies can utilize cross-lagged models to test the reciprocal associations between parental factors and adolescent well-being measures.

Fourth, family economic status and intactness were treated as control variables that were time invariant. It is possible that these two factors change over time, which could subsequently result in changes in both parents' behaviors and adolescents' life satisfaction and feelings of hopelessness. In addition, in the present study, only a very small proportion of the participants reported family economic disadvantage or family intactness, meaning that no variability was controlled for most of the adolescents. Future research will benefit from recruiting students living in more diversified environment and taking into account changes in their family conditions.

Despite these limitations, this study was among the first to



investigate the linkages between developmental trajectories of parental factors and developmental trajectories of adolescent well-being. Our findings add value to the research field by revealing how changes in parenting may affect trajectories in adolescent well-being. The findings provide further evidence for the long-term positive impacts of parents' behavioral control and parent-child relationship as well as the harmful influence of psychological control. Additionally, this study also suggests that girls seem to be more vulnerable to psychological control. These findings highlight the importance of considering parental changes and child gender in testing parental impacts in the long run.

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## CRedit authorship contribution statement

**Xiaoqin Zhu:** Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing, Funding acquisition. **Daniel TL Shek:** Conceptualization, Writing - review & editing, Supervision, 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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