

How does parental involvement matter for children's academic achievement during school closure in primary school?

Xiao Yu^{1,2} | Yinghe Chen³ | Chunliang Yang³ | Xiujie Yang⁴  |
Xin Chen³ | Xixi Dang⁵

¹Department of Psychology, School of Humanities and Social Sciences, Beijing Forestry University, Beijing, China

²Beijing Key Lab of Applied Experimental Psychology, Faculty of Psychology, Beijing Normal University, Beijing, China

³School of Developmental Psychology, Faculty of Psychology, Beijing Normal University, Beijing, China

⁴Faculty of Psychology, Beijing Normal University, Beijing, China

⁵Department of Psychology, Zhejiang Sci-Tech University, Zhejiang, China

Correspondence

Xiujie Yang, Faculty of Psychology, Beijing Normal University, 19 Xijiekouwai Avenue, Haidian District, 100875 Beijing, China.
Email: amyang@bnu.edu.cn

Funding information

Beijing Education Science Planning of 14th Five-year, Grant/Award Number: BEAA21030; The National Natural Science Foundation of China, Grant/Award Number: 32000757; Open Research Fund of the State Key Laboratory of Cognitive Neuroscience and Learning, Grant/Award Number: CNLZD2105

Abstract

Background: COVID-19 has infected over twenty million people across 200 countries. UNESCO claimed that more than 190 countries had implemented countrywide school closures, which resulted in preventing 1.6 billion students of their classroom learning opportunities. As children are unable to study in the classroom with teachers' supervision, the importance of parental engagement is amplified in children's learning at home.

Aim: The primary purpose of the present study was to investigate how parental involvement contribute to children's academic achievement during school closure.

Sample: Two hundred and twenty-nine primary school children and their parents.

Method: Children's academic achievement before (T1) and after school closure (T3), parental involvement (T2) and children's learning engagement (T2) during school closure were measured.

Results: After controlling for gender, age, grade and SES, children's learning engagement (T2) served as a full mediator of the association between parental involvement (T2) and children's academic achievement from T1 to T3. Moreover, parental psychological control (T2) moderated the association between parental involvement (T2) and

Xiao Yu and Yinghe Chen are co-first authors. They made equal contributions to this manuscript.

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children's learning engagement (T2). Specifically, the contribution of parental involvement to children's learning engagement became stronger for children whose parents had higher levels of psychological control. Higher Chinese parental psychological control did not always correlate to lower academic outcomes in the context of COVID-19.

Conclusion: These findings highlight the central roles of parental involvement and children's learning engagement in children's academic achievement during school closure caused by COVID-19.

KEYWORDS

academic achievement, children's learning engagement, COVID-19, parental involvement, parental psychological control

INTRODUCTION

COVID-19 has infected over twenty million people across 200 countries. UNESCO claimed that more than 190 countries had implemented countrywide school closures, which resulted in preventing 1.6 billion students of their classroom learning opportunities (UNESCO, 2020). According to Xinhua News Agency (2020), over two hundred million students were affected by school closures in China. UN secretary General Antonio Guterres also claimed that COVID-19 had caused the worst educational disruption in human history (UNESCO, 2020). As children are unable to study in the classroom with teachers' supervision, the importance of parental engagement is amplified in children's learning at home. Indeed, UNICEF has investigated the impact of COVID-19 on children aged 7 to 14 in many middle-income countries and emphasized the crucial role of parents in children's reading and numeracy skills (Brossard et al., 2020). The primary goal of the present study was to examine the relationships among parental involvement, parental psychological control and children's learning engagement and academic achievement during school closure.

Parental involvement and children's academic achievement

Generally, parental involvement refers to parents' active participation to support children's educational progress (EI Nokali et al., 2010; Fishel & Ramirez, 2005; Karbach et al., 2013; Wang & Sheikh-Khalil, 2014). It broadly includes homework assistance, parental expectations about children's academic outcomes, and parental support, such as providing appropriate learning materials. The statistically significant and positive relationship between parental involvement and children's academic achievement has been reported in several meta-analyses (Boonk et al., 2018; Castro et al., 2015; Fan & Chen, 2001; Jeynes, 2005, 2007; Hill & Tyson, 2009). However, some empirical research does not provide clear evidence for the association between parental involvement and children's academic achievement. Specifically, the types of parental involvement may modulate this relationship. If parental involvement is conceptualized as parental expectations (Castro et al., 2015; Gubbins & Otero 2016; Phillipson, & Phillipson, 2012) or parental supervision (You et al., 2015) for children's academic achievement, the positive relationship is more dominant. However, if parental involvement is defined as homework assistance, the relationship between parental involvement and children's academic achievement is negligible and even negative (Gonida & Cortina 2014; Pezdek et al., 2002; Wilder, 2014). For example, an

intervention study showed that 6th grade children who obtained more parental help on their mathematics homework only benefited slightly in the post-test stage than children who received less parental help on their mathematics homework (Balli et al., 1997). Several reviewed studies also identified that parental involvement and control of children's homework did not necessarily improve children's academic achievement (Patall et al., 2008). Dumont et al. (2012) even observed a negative association between parental involvement (i.e., children perceived parent–child conflict related to homework) and children's academic achievement. These studies are examples indicating that findings on parental involvement and its relationship with children's academic achievement are mixed.

Additionally, cross-cultural studies have shown that even in regular situations, Chinese parents are more frequently involved in their children's academics than American parents and European parents (Chen & Uttal, 1988; Cheung, & Pomerantz, 2011; Pan et al., 2006). During the lockdown period, parents worked and meanwhile children studied at home. Based on the Chinese notion '*guan*', Chinese parents may take more responsibility for children's learning (Chao, 1994; Cheung & Pomerantz, 2011; Tobin et al., 1989) and exhibit various types of parental involvement (i.e., parental expectation and homework assistance) in children's learning. From this perspective, an interesting question is raised: what is the relationship between Chinese parental involvement and children's academic achievement during the special period of school closure? For clarification, it is necessary to examine the mechanisms through which and under what conditions Chinese parental involvement is associated with Chinese children's academic achievement during the period of school closing.

The mediating role of children's learning engagement on the association of parental involvement and children's academic achievement

Learning engagement refers to children's involvement in their learning activities and is typically clustered into three categories: behavioural engagement, emotional engagement and cognitive engagement (Archambault & Dupere, 2016; Fredricks et al., 2004; Olivier et al., 2021). Specifically, behavioural engagement refers to involvement in academic or extracurricular activities and is essential for achieving high academic performance. Emotional engagement involves students' feelings about learning and strongly relates to children's willingness to learn. Cognitive engagement incorporates a willingness to expend effort to comprehend difficult information or master complex skills (Fredricks et al., 2004).

Some researchers posited that more parental involvement would enhance children's intrinsic motivation (Gonzalez et al., 2005; Jungert et al., 2020). This would promote children's learning engagement as well as academic performance (Mustami'ah et al., 2020; Nunez et al., 2021; Steinmayr et al., 2019). Specifically, the motivational development model explained that when parents are involved, children would become more motivated and engage more in learning for parent-oriented reasons. In turn, children's academic achievement would be enhanced. This model has been tested in many countries including China (e.g., Cheung & Pomerantz, 2011, 2012; Pomerantz et al., 2007; Pomerantz & Moorman, 2010). Thus, children's learning engagement may be a mediator that links parental involvement and children's academic achievement.

Moreover, previous empirical studies have indicated a mediating role of children's learning engagement in the relationship between parental involvement and children's academic achievement. On the one hand, the well-established and positive associations between parental involvement and children's behavioural, emotional and cognitive engagement have been consistently documented (Castro et al., 2015; Linver et al., 2002; Loera et al., 2011). For example, Loera et al. (2011) found that parental involvement in reading, such as reading to children or offering reading materials to their children, facilitates children's reading engagement. On the other hand, previous research has shown a positive association between children's learning engagement and academic achievement in children in grade 5 (Marks, 2000), in grades 6 to 7 (Cheung & Pomerantz, 2012) and in grades 9 to 11 (Sirin & Sirin, 2005). The authors explained that engaged children regularly attend courses, concentrate on learning, avoid disruptive behaviours and generally perform well in academics. In summary, children's learning engagement is an

antidote to poor academic performance and is affected by parental involvement (Finn & Rock, 1997; Fredricks et al., 2004; Loera et al., 2011). When considering this evidence together, it is reasonable to assume that children's learning engagement might mediate the association between parental involvement and children's academic achievement.

Relations among parental involvement, parental psychological control, children's learning engagement and academic achievement

Parental psychological control refers to the extent to which parents excessively exert manipulative parenting techniques, such as guilt induction, shaming and love withdrawal (Barber, 1996). The self-determination theory (SDT) proposes that there are three basic psychological needs: autonomy (the perception of self-authorship of one's actions), relatedness (attaining a sense of belonging and relationships) and competence (being effective in one's actions and attaining a sense of mastery) (Ryan & Deci, 2017). While, parental involvement and parental psychological control may facilitate or hinder children's academic development in different ways (Soenens & Vansteenkiste, 2010; Yu et al., 2016). For instance, parental involvement is mainly related to children's needs for relatedness (Yu et al., 2016), whereas parental psychological control conflicts with children's autonomy needs (Deci & Ryan, 1985; Li et al., 2019). Thus, children from highly controlling families often face autonomy-relatedness conflicts. Their parental involvement is conditional and inauthentic. But in the long run, the conflicts and paradox of the parent–child association may exert a negative effect on children's learning engagement. Specifically, some studies have found that the association between parental involvement and children's engagement depends on the type of parental psychological control. For example, Li et al. (2019) examined the integral contributions of parental involvement, autonomy support and psychological control in predicting Chinese children's learning motivation (such as achievement goals and learning engagement) and revealed four distinct profiles of perceived parental involvement labelled low involvement-high control, moderate all, high all and moderate involvement-high autonomy support. They found that children with moderate involvement-high autonomy support engaged more in learning, while children with low involvement-high control were more maladaptive and tend to exhibit poor academic development. Therefore, parental psychological control may be a potential moderator underlying the relationship between parental involvement and children's learning engagement.

Within the framework of SDT, several studies have investigated the potential moderating role of parental psychological control in the effect of parental involvement on children's academic behaviour. For example, Pomerantz et al. (2007) assumed that if parents reduce psychological control and allow autonomy when they are involved in their children's academic activities, children would engage more in learning. The results from subsequent studies suggested that the association between parental involvement and children's performance-approach goals is moderated by parental psychological control (Zong et al., 2018). Namely, when children perceived a low level of parental psychological control, parental involvement (especially home-based involvement) positively predicted children's performance-approach goals. While, when children perceived a high level of parental psychological control, parental involvement had no significant effect on children's performance-approach goals.

Moreover, in the course of the global COVID-19 lockdown, school closures forced parents to care for their children around the clock. They have to supervise their children in online courses and homework. This implied that parents had to rebalance work and child care (i.e., parental involvement and parental psychological control in children's academic education), which is quite different from regular situations (Cui et al., 2020; Neubauer et al., 2021). Therefore, the current study was designed to provide novel insights into the question of whether parental psychological control plays a moderating role in the association between parental involvement and children's learning engagement during school closure.

Overview of the current study

In summary, the present study aimed to examine the associations among parental involvement, children's learning engagement, parental psychological control and children's academic achievement during the COVID-19 pandemic (see [Figure 1](#)). Because the close association between parental involvement and children's academic achievement appears more evident in primary school years (Boonk et al., 2018; Hill & Tyson, 2009), the target population in the present study was elementary school children. Additionally, previous studies have indicated that age, gender, grade and SES are statistically significantly associated with parental involvement and children's academic achievement (Choi et al., 2015; Masarik & Conger, 2017; Sirin, 2005). Thus, the current study included age, gender, grade and SES as covariates.

This study was guided by the following hypotheses (see [Figure 1](#)):

Hypothesis 1 *Children's learning engagement will mediate the association between parental involvement and children's academic achievement during school closure after controlling for grade, age, gender and SES.*

Hypothesis 2 *When controlling for covariates, parental psychological control will moderate the path from parental involvement to children's learning engagement. Specifically, during school lockdown, parental psychological control should be required by children to regulate their learning schedules, and the contribution of parental involvement to children's learning engagement should be stronger for children whose parents have higher levels of psychological control.*

METHOD

Participants

Participants were randomly recruited from Yantai city of Shandong Province, China. Participants at T1 were 234 primary school students (108 boys; mean age was 10.09 ± 0.80 years old), including 63 third graders, 95 fourth graders and 71 fifth graders. Participants at T2 were the same 234 primary school students and their parents. And participants at T3 were 229 primary school students (106 boys; mean age was 10.84 ± 0.90 years old), including 63 third graders, 91 fourth graders and 70 fifth graders. A logistic regression analysis showed that participants' attrition was not related to children's obtained scores on any of these variables, indicating that participants' attrition was caused by random reasons. We used the full-information maximum likelihood (FIML) approach to handle missing data. The FIML estimate model is less likely to result in biased parameter estimates than listwise or pairwise deletion (Graham, 2009).

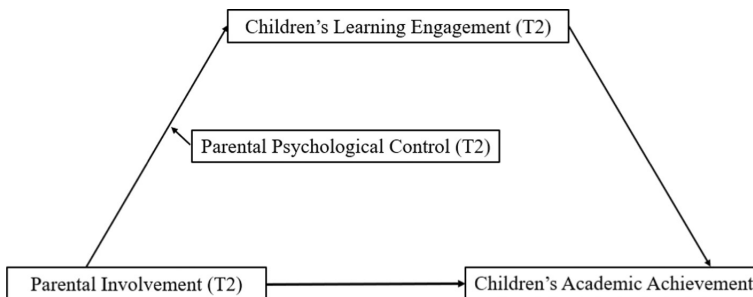


FIGURE 1 The hypothesized model of parental involvement, children's learning engagement, parental psychological control and children's academic achievement during school closure, controlling for age, gender, grade and SES. *Note:* 'Children's Academic Achievement' indicated the difference between standard academic scores at T3 and standard academic scores at T1

All students are typically developing children and native Chinese speakers. Based on information from the statistical yearbook released on the official website of Shandong Provincial Statistics (<http://www.stats.com.cn/tjsj/tjsj.asp>), all children came from middle-class families. Informed consent was obtained from their parents.

Procedure

COVID-19 has resulted in the postponement of school reopening in China since February, 2020, and students were not allowed return to class until June 2020 when the COVID-19 was under control. Data on children's academic achievement was collected twice at school before and after the COVID-19 pandemic, respectively, in December 2019 (time 1--T1) and July 2020 (time 3--T3). Children's learning engagement, parental involvement and psychological control were assessed via an online survey in April 2020 (time 2--T2). Participants completed the online surveys during school closure, when they were taking online classes at home. Children required approximately 5 to 8 minutes to complete the children's learning engagement questionnaire. Parents required approximately 15 to 25 minutes to complete the parenting questionnaire and demographic information survey. After completing the online questionnaires, each family received a detailed feedback on parenting for their participation. This study was approved by the ethics committee of the university. Written informed consent was obtained from each participant and their guardians.

Measures

Parental involvement

Parental involvement was assessed using a Chinese version of Parental Involvement scale with 23 items (Cheung & Pomerantz, 2011; Grolnick & Slowiaczek, 1994). The measure included three latent constructs of parental involvement, namely, *cognitive involvement* (with 8 items, such as 'I study the textbooks and tutorials on my own first in order to help my children to learn them'), *behavioural involvement* (with 6 items, such as 'I made a schedule of watching TV for my children') and *personal involvement* (with 9 items, such as 'I helped my child to defuse his/her negative emotions during their studies'). Parents were asked to complete the questionnaire on a scale ranging from '1 = never' to '5 = very often'. The mean scores of all items were calculated, with higher scores indicating higher levels of parental involvement. These scales have been used among Chinese students, which showed well-reliability and well-valid in previous research (Cheung & Pomerantz, 2011; Grolnick & Slowiaczek, 1994; Zhang et al., 2020). We also conducted confirmatory factor analyses (CFAs) to examine the three dimensions. The CFA supported the model fit indices: $\chi^2/df = 1.96$, $CFI = .92$, $TLI = .90$, $SRMR = .06$ and $RMSEA = .05$. In the current study, the three scales demonstrated good reliability (McDonald's omega ranged from .74 to .82) and the McDonald's omega of the whole measure was .92.

Parental psychological control

Parental psychological control was measured by a subscale of the Chinese version of the Parental Psychological Control scale (Cheung & Pomerantz, 2011; Wang et al., 2007). The scale included three dimensions, namely, *guilt induction* (with 9 items, such as 'We told our child that if he or she truly cared about us, he would not do anything that would worry us'), *love withdrawal* (with 4 items, such as 'If the child did something we did not like, we wouldn't let the child do stuff with us') and *authority assertion* (with 4 items, such as 'I told my child that we wanted him to do what was best for him and that he should not question this'). Parents were asked to complete the questionnaire and

answered these 17 items on a scale ranging from '1= *never to*' to '5 = *almost*'. Mean scores were calculated to reflect the level of parental psychological control. Higher scores indicated stronger parental psychological control. The CFA supported the three proposed parental psychological control measures as unique latent dimensions, and the model fit indices were $\chi^2/df = 1.92$, $CFI = .93$, $TLI = .91$, $SRMR = .06$ and $RMSEA = .06$. In the current study, the three scales displayed good reliability (McDonald's omega ranged from .75 to .88), and the McDonald's omega of the whole measure was .89.

Children's learning engagement

Children were asked to report the extent to which each statement was true for themselves during school closure. Ten items were used to assess children's learning engagement (Lam et al., 2014). As an example, 'I can study for a long time with little rest'. Each item was rated on a scale ranging from '1= *Not at all true for me*' to '5 = *Very true for me*'. Mean scores across items were calculated, with higher scores indicating greater academic engagement. The model fit indices were $\chi^2/df = 1.17$, $CFI = .99$, $TLI = .99$, $SRMR = .02$ and $RMSEA = .03$. In this sample, the McDonald's omega of the scale was .92.

Academic achievement

Children's final grades in three major subjects (i.e., Chinese, English and math) were obtained from school records immediately before and after school lockdown because of COVID-19. The examinations are based on the national curriculum standards for elementary school students. The final grades at T1 were obtained in December 2019 (i.e., before school lockdown for COVID-19). The final grades at T3 were obtained in July 2020 (i.e., when the school was reopened after a semester of school lockdown). Children's final grades in Chinese, English and math were averaged and standardized within their grades. The standard Z-scores were considered as the indicators of children's academic achievement. Because we solely focused on children's performance during school closure, we calculated children's academic achievement progress by calculating differences in children's standard academic scores before and after school closing (i.e., standard academic scores at T3 - standard academic scores at T1). Higher scores reflect higher academic achievement during school closure. In this sample, McDonald's omega of the scale was .84 for the first final grades and .83 for the second final grades.

Covariates

The present study included students' gender (0 = female, 1 = male), age (9 to 12 years), grade level (3rd to 5th) and family socioeconomic status (SES) as control variables. SES was indexed based on parental highest parental educational level, parental occupation and family monthly income. Parents answered questions on their level of education, which included both mother's and father's highest level of education according to the following scale: 1 = High school and below, 2 = Junior college or technical secondary school, 3 = Bachelor's degree, 4 = Master's degree and 5 = Doctor's degree or above. Parental occupation was rated as the highest value between the parents' occupation scores based on the International Standard Classification of Occupations (Yang et al., 2019). The original scores were reversed, ranging from 9 (managers) to 0 (not working). Parents also rated their 'family monthly income', which covered both mothers' and fathers' income, using the following scale: 1 = 2000 or less, 2 = 2000–5000, 3 = 5000–10,000, 4 = 10,000–30,000, 5 = over 30,000. Correlations among these factors ranged from .38 to .65, $pr < .001$. In this sample, the McDonald's omega of the scale was .87.

TABLE 1 Descriptive statistics and correlations for all variables. (N = 229)

Variable	1	2	3	4	5	6	7	8
1. Gender	1							
2. Age	.08	1						
3. Grade	-.01	.69**	1					
4. SES	.02	-.05	-.03	1				
5. Parental involvement	.01	-.10	-.14*	.19*	1			
6. Parental psychological control	.09	-.10	-.07	-.19**	.11	1		
7. Children's learning engagement	-.23**	.14*	.10	.03	.38**	-.07	1	
8. Academic achievement	.05	.08	.13*	.10	.10	-.14*	.18**	1
<i>M ± SD</i>	–	10.59 ± .91	4.09 ± .78	5.85 ± 1.83	3.60 ± .71	2.05 ± .66	3.82 ± .81	.00 ± 1.00
<i>M</i> ₁	0	9	3	3	1	1	1	–46.72
<i>M</i> ₂	1	13	5	11	5	5	5	30.07

Note: 1. ** $p < .01$, * $p < .05$. 2. Academic achievement was reported as standardized z-scores within each grade and represented the differences in children's standard academic scores before and after the school closing (i.e., standard academic scores at T3 - standard academic scores at T1). 3. A negative score indicated that children's academic performance decreased during the school lockdown.

Data analysis

First, a preliminary analysis was conducted to compute means, standard deviations and correlations among the involved variables. Second, the mediating effects of children's learning engagement on the relationship between parental involvement and academic achievement were examined using PROCESS macro software (Preacher & Hayes, 2004). The bias-corrected bootstrap method with 5000 resample was employed to calculate the 95% confidence intervals (CI) (Hayes & Scharkow, 2013; Tian et al., 2021). The moderated mediation effects would be found only when the interaction was significant and the 5000 bootstrapped 95% confidence interval did not include zero (Preacher et al., 2007). The simple slope analyses would be conducted when the moderating effects existed.

RESULTS

Preliminary and correlation analyses

Common method bias (CMB) can influence correlations among variables in self-reported studies (Lindell & Whitney, 2001). Thus, the present study conducted procedural remedies, including anonymous surveys and the use of reverse-worded items to control common method variance (CMV). Additionally, we employed Harman's single-factor test to test CMV. Specifically, we set the common factor of all variables to 1. Each item of all variables was used as the explicit variable for confirmatory factorial analysis. The CFA showed that $\chi^2/df = 4.02$, $CFI = .34$, $TLI = .32$, $SRMR = .16$ and $RMSEA = .12$. The model fit was unsatisfactory, indicating that there was no common method bias.

Means, standard deviations and correlations for the main variables are presented in Table 1. Results showed that children's learning engagement was positively correlated with parental involvement ($r = .38$, $p = .001$) and children's academic achievement ($r = .18$, $p = .01$). Parental psychological control was negatively correlated with children's academic achievement ($r = -.14$, $p = .03$). While, parental psychological control was not significantly correlated with parental involvement or children's learning engagement.

The mediating role of children's learning engagement

First, the total effect of parental involvement on children's academic achievement was statistically non-significant (total effect size = .90, $SE = .59$, $t = 1.54$, $p > .05$, 95% CI = [-.25, 2.06]) when controlling for age, grade, gender and SES.

Then, as shown in Figure 2, after controlling for age, grade, gender and SES, parental involvement was entered as the independent variable, with children's academic achievement as the outcome variable and children's learning engagement as the mediator. The model explained 24.32% of the variance in children's learning engagement ($F [5, 223] = 14.33$, $R^2 = .24$, $p < .001$) and explained 6.46% of the variance in children's academic achievement ($F [6, 222] = 2.55$, $R^2 = .06$, $p < .05$). Parental involvement was a statistically significant predictor of children's learning engagement ($\beta = .41$, $SE = .06$, $t = 6.92$, $p = .000$, 95% CI = [.30, .53]), but not a statistically significant predictor of children's academic achievement ($\beta = .03$, $SE = .64$, $t = .52$, $p = .68$, 95% CI = [-1.00, 1.53]). Children's learning engagement was a statistically significant predictor of children's academic achievement ($\beta = .18$, $SE = .65$, $t = 2.37$, $p = .02$, 95% CI = [.26, 2.82]). The indirect effect of parental involvement on children's academic achievement through children's learning engagement was statistically positive and significant at a 95% confidence interval (indirect effect size = .64, $SE = .33$, 95% CI = [.05, 1.36]). By controlling the mediators, the direct effect of parental involvement on children's academic achievement was not statistically significant (direct effect size = .27, $SE = .64$, $t = .42$, $p = .68$, 95% CI = [-1.00, 1.53]), indicating the full mediation of children's engagement in the relationship between parental involvement and children's academic achievement. These results fully supported hypothesis 1.

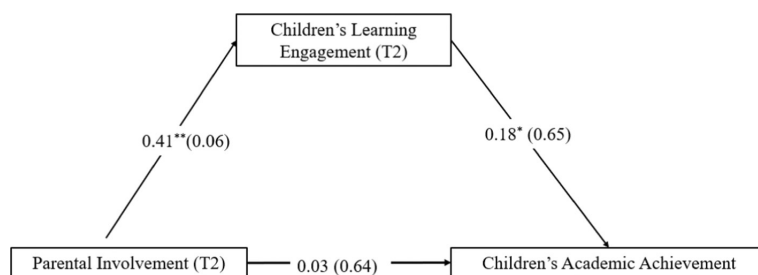


FIGURE 2 Mediating effects of children's learning engagement. *Note:* 1 Numbers outside of the brackets are the standardized coefficients, and numbers inside the brackets are the standard errors. 2. Gender, age, grade and SES were controlled for but were not shown for simplicity of presentation. 3. 'Children's Academic Achievement' indicated the difference between standard academic scores at T3 and standard academic scores at T1

The moderated mediation analysis

As shown in [Table 2](#), Model 7 PROCESS for SPSS was used to test the hypothesized moderated mediation model. The model explained 28.56% of the variance in children's learning engagement ($F [7, 221] = 12.62, R^2 = .29, p < .001$) and explained 6.46% of the variance in children's academic achievement ($F [6, 222] = 2.55, R^2 = .06, p < .05$). Having examined the moderating effect of parental psychological control, the results indicated that parental involvement negatively predicted children's learning engagement ($\beta = -.17, SE = .06, t = -2.66, p = .01, 95\% CI = [-.30, -.04]$) and the interaction term between parental involvement and parental psychological control significantly and positively predicted children's learning engagement ($\beta = .19, SE = .06, t = 3.28, p = .001, 95\% CI = [.08, .30]$). [Table 3](#) shows the bootstrapping estimates and slope coefficient for the conditional indirect effects of the model. Parental involvement was positively related to children's learning engagement at high (+1 *SD*) level of parental psychological control than that at low (-1 *SD*) level.

The simple slope analysis ([Figure 3](#)) indicated that the association between parental involvement and children's learning engagement was statistically significant and positive for both high and low levels of parental psychological control (lower level of parental psychological control: $\beta = .27, SE = .08, t = 3.54, p < .001, 95\% CI = [.12, .42]$; high level of parental psychological control: $\beta = .61, SE = .08, t = 7.52, p < .001, 95\% CI = [.45, .77]$). Specifically, during the school lockdown, the contribution of parental

TABLE 2 The moderated mediation models

Predictors	Children's learning engagement			Children's academic achievement		
	β	SE	95%CI	β	SE	95%CI
Consent	-1.50*	.74	[-2.97, -.04]	-5.55	7.37	[-20.07, 8.98]
Gender	-.42***	.12	[-.65, -.19]	1.57	1.18	[-.76, 3.90]
Grade	.06	.10	[-.15, .25]	1.70	1.01	[-.28, 3.69]
Age	.15	.09	[.08, .30]	-.45	.87	[-2.16, 1.27]
Parental involvement	.44***	.06	[.32, .55]	.27	.64	[-.99, 1.52]
Parental psychological control	-.17**	.06	[-.30, -.04]			
Parental involvement \times Parental psychological control	.19**	.06	[.08, .30]			
Children's learning engagement				1.54*	.65	[.26, 2.82]
R^2	.29			.06		
F	12.62***			2.55*		

Note: *** $p < .001$, ** $p < .01$, * $p < .05$.

TABLE 3 Bootstrap estimates of indirect effects at $-1SD$ and $+1SD$ moderator levels

Parental psychological control level	Indirect effect	SE	95% bootstrap CI
$-1 (M - 1SD)$.42	.24	[.03, .98]
$0 (M)$.62	.32	[.06, 1.32]
$1 (M + 1SD)$.94	.47	[.08, 1.95]

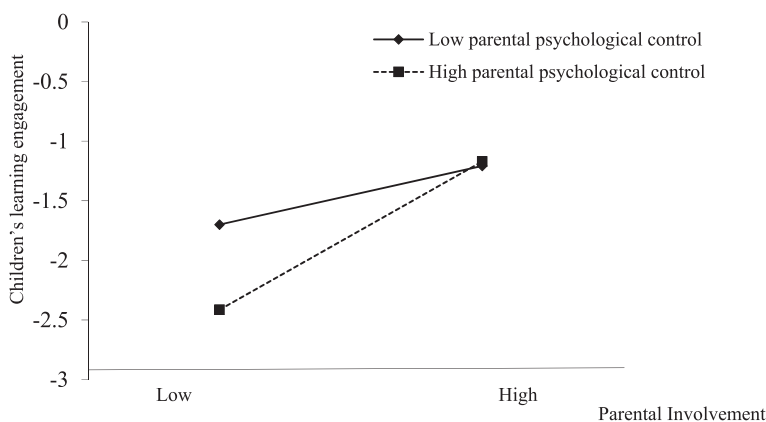


FIGURE 3 Parental psychological control moderated the relation between parental involvement and children's learning engagement. *Note:* Two levels of parental psychological control were graphed: one standard deviation above the mean and one standard deviation below the mean

involvement to children's learning engagement was stronger for children whose parents had high levels of psychological control than for those whose parents had low levels of psychological control. These results fully supported hypothesis 2.

GENERAL DISCUSSION

The present study examined the relationships among Chinese parental involvement, parental psychological control, children's learning engagement and children's academic achievement during school closure with a three-wave longitudinal design. After controlling for gender, age, grade and SES, children's learning engagement emerged as a full mediator of the association between parental involvement and children's academic achievement, and parental psychological control moderated the association between parental involvement and children's learning engagement.

Consistent with the findings from many previous studies (Castro et al., 2015; Lee & Bowen, 2006; Uluhan & Yasemin, 2018; Weihua et al., 2010), the current study documented a positive correlation between parental involvement and children's learning engagement. With a strong desire of having an outstanding child, Chinese parents would do their best to be involved in their child's academic career. For example, they may emphasize the importance of education, give constant encouragement (Marjoribankes, 2005) and provide consistent support for the learning environment and resources to their children (Sheldon & Epstein, 2005). In addition, the positive association between children's learning engagement and academic achievement was also documented in the present study. Engaged students are usually active, goal-directed and persistent in their academics, which might be related to better academic outcomes (Dehyadegary et al., 2011; Furrer & Skinner, 2003; Nota et al., 2004).

However, in contrast to previous studies showing that parental involvement was positively related to parental psychological control for Chinese children (Cheung & Pomerantz, 2011), the current study found no significant relationship between them during school closure. During the national lockdown, Chinese parents worked at home, who might pay more attention to their children's academics and apply much more controlling methods (e.g., love withdrawal to punish children) or autonomy methods (e.g., opinion exchange) to motivate their children to study harder (Chen et al., 2020; Giorgio et al., 2020). Hence, parental involvement may combine with different levels of parental controlling during school closure.

Mediating role of children's learning engagement

The results showed that children's learning engagement played a mediating role in the association between parental involvement and children's academic achievement. This highlighted that the most important role in promoting children's academic achievement during school lockdown was parental support in facilitating children's autonomous learning. That is, during school closure, parental involvement facilitated children's learning engagement, which subsequently improved children's academic achievement. According to previous findings, the association between parental school-based involvement and academic achievement is mediated by academic engagement (Easton, 2010; Hedvat, 2008), and the current study provided convergent evidence from home-based parental involvement. Due to COVID-19, school closing enforced parents to work at home, and children had to study online with parents, resulting in more home-based parental involvement. Parents were more aware of their children's academic progress and provided more support to their children's learning, such as providing more guidance and encouragement to children. Children might engage more in academics when their parents show high expectations, and might attain higher academic achievement. Furthermore, unlike previous studies using child reports (Cheng & Pomerantz, 2012), the current study utilized parental reports to measure parental involvement, which provided the consistent mediation results. These findings suggested that parental involvement and children themselves were both beneficial factors contributing to children's academic achievement.

Moderating role of parental psychological control

The results showed a moderating role of parental psychological control between parental involvement and children's learning engagement among primary school students. This moderating effect demonstrated that with either level of parental psychological control, parental involvement was positively associated with children's learning engagement. It was worth noting that, in contrast to previous studies (Ma & Bellmore, 2012; Wang et al., 2007; Zong et al., 2018), in the context of school closure, parental involvement was still positively associated with children's learning engagement even when parental psychological control was at high level.

Two explanations are possible for this result. On the one hand, cross-cultural studies have showed that although Chinese parents exert greater psychological control over children than American or European parents, this higher level of psychological control does not prevent children from increasing their engagement and achievement (Chao & Tseng, 2002; Cheung & Pomerantz, 2011; Ng et al., 2014; Pomerantz et al., 2008). While, during school closure, children could not obtain sufficient learning support from their teachers (Lau & Lee, 2021; Yan et al., 2021), and hence parental factors played a more important role (Neubauer et al., 2021). Influenced by the Confucian values, Chinese parental psychological control not only relies on guilt induction and love withdrawal, but also prefers to guide and monitor their children's behaviours (Cao et al., 2020). During this special moment, parental psychological control, such as parental guidance and perceived parental expectations (Leung et al., 2016), may have fostered children's self-regulation. Thus, even if parents are at high level of psychological control, parental involvement still could be still positively

associated with children's learning engagement. On the other hand, as shown in [Figure 3](#), children typically receive more emotional, intelligence and behavioural supports from their parents especially children with high levels of parental involvement and high levels of psychological control. Parents would buy studying materials for children, help children review the knowledge, check children's homework and encourage children more. In this case, even if parental psychological control is strong, children still engage more in academic activities (Spera, 2005). That is, if children's parents are controlling, it's less damaging if parents are highly involved. While, parents involve less in children's learning but control them at high level, their children would be more likely to engage less in academic learning.

Overall, stronger Chinese parental psychological control does not always relate to children's lower academic outcomes in the context of school closure; this was different from findings conducted prior to the pandemic (Li et al., 2019; Lu et al., 2017; Wang et al., 2012).

Limitations and future directions

The current study has many strengths, such as its focus on the associations between parental factors and children's academic achievement and the recruitment of three-wave data. Notably, the current study also had several limitations. First, the self-report questionnaires were used for all measures except children's academic achievement measures, which might result in information bias. Future research obtaining additional data from other sources (e.g., parental involvement obtained from children themselves and their teachers) would be valuable. Second, China controlled the COVID-19 outbreak quickly, and the situation has returned to normal soon after the occurrence of the COVID-19, which is different from many other countries. Thus, the generalizability of the current findings should be further tested in other countries. Third, it needs to be acknowledged that the relationship between parental involvement and children's academic outcome was correlational, which could not obtain casual inferences from the present model.

Conclusions and educational implications

The current study provided one of the earliest evidence on the relationship between parental involvement and children's academic performance during school closure caused by COVID-19. Specifically, the quality of parental involvement and children's learning engagement were linked to children's academic achievement during school closure. Parental psychological control moderates the association between parental involvement and children's learning engagement. The contribution of parental involvement to children's learning engagement becomes stronger for children whose parents have higher levels of psychological control. The present findings provided important implications for parents and educators. Specifically, due to the lack of support from teachers and peers, the supportive role of parents becomes prominent for promoting children's academic outcomes during school lockdown. Parents should devote more emotional involvement (e.g., showing more concerns to children and communicating frequently with their children) (Moe et al., 2018; Moe et al., 2020), more cognitive involvement (e.g., providing instrumental help with homework if needed) (Karbach et al., 2013) and more behavioural involvement (i.e., regulating and monitoring children's bad or unhealthy behaviours) (Nunez et al., 2021) in children's learning during the lockdown. Thus, teachers should encourage parents to show their psychological capital and to give their children more educational support and psychological support. Schools would provide parents with technical guidance (e.g., how to use video tools) as well as psychological assistance (e.g., how to reduce parents' anxiety and increase parental involvement in children's learning) for home-based instructions during school closure.

AUTHOR CONTRIBUTIONS

Xiao Yu: Conceptualization; project administration; writing – original draft; writing – review and editing. **Yinghe Chen:** Conceptualization; data curation. **Chunliang Yang:** Conceptualization; data

curation. **Xiujie Yang**: Data curation; funding acquisition; writing – review and editing. **Xin Chen**: Data curation. **Xixi Dang**: Data curation.

ACKNOWLEDGEMENTS

This research was supported by the National Natural Science Foundation of China (32000757), the Science Foundation for the Excellent Youth Scholars from Faculty of Psychology, Beijing Normal University (2019004, 310422123 and 2020NTSS31) and the COVID-19 Psychological Support Program from Tencent-Mercedes-Benz Foundation, Beijing Normal University Education Foundation (600187) to Xiejie Yang.

CONFLICTS OF INTEREST

All authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Xiujie Yang  <https://orcid.org/0000-0001-8866-0203>

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How to cite this article: Yu, X., Chen, Y., Yang, C., Yang, X., Chen, X., & Dang, X. (2022). How does parental involvement matter for children's academic achievement during school closure in primary school?. *British Journal of Educational Psychology*, 00, e12526. <https://doi.org/10.1111/bjep.12526>