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PARENTAL SELF-CONTROL & ADOLESCENT PSYCHOLOGICAL ADJUSTMENT

Parental Self-Control Facilitates Adolescent Psychological Adjustment Sequentially through Parents' Perceived Stress/Mindful Parenting and Adolescent Self-Control

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Abstract

Adolescence is a unique developmental period marked with significant changes and challenges. As such, maintaining optimal psychological adjustment is crucial for young people, especially during the COVID-19 pandemic when their adjustment became more challenging. Self-control is a vital ability assisting individuals to navigate difficulties and stay well-adjusted during turbulent times. Whilst the associations between adolescent self-control and adjustment have been well documented, parental self-control has been considered to play a more fundamental role in adolescent adjustment. However, this consideration has received scant research. Drawing on the intergenerational transmission model of self-regulation, we examined an understudied yet plausible idea that parental self-control facilitates adolescent adjustment through parents' lower levels of perceived stress/better mindful parenting and adolescents' improved self-control. A two-wave survey study, spanning one year apart, was conducted among 426 Chinese adolescents ($M_{\text{age}}=11.6$ years, 53.5% boys) and their parents. Parents rated their self-control, perceived stress, and mindful parenting at T1, whilst adolescents rated their self-control and adjustment (i.e., psychological difficulties and life satisfaction) at T1 and T2. The results of chain mediation model showed that after controlling for demographic covariates and baseline levels of adolescent self-control and adjustment, T1 *paternal* self-control facilitated T2 adolescent adjustment through fathers' lower levels of perceived stress and adolescents' improved self-control. By contrast, T1 *maternal* self-control facilitated T2 adolescent adjustment through mothers' better mindful parenting and adolescents' improved self-control. These findings advance our understanding of how self-control is transmitted from parents to offspring and clarify the processes of how parental self-control facilitates adolescent adjustment.

Keywords: self-regulation; mental health; subjective well-being; mindful parenting; perceived stress; intergenerational transmission

Parental Self-Control Facilitates Adolescent Psychological Adjustment Sequentially through Parents' Perceived Stress/Mindful Parenting and Adolescent Self-Control

Optimal psychological adjustment is important for adolescents, as adolescence is a period marked by profound changes and challenges that might potentially turn into adjustment problems, such as emotional upheaval, decreased well-being, and self-control failure (Arnett, 1999; Casas et al., 2018; Duckworth & Steinberg, 2015). During the COVID-19 pandemic, adolescent adjustment became a more concerning issue. Adolescents were exposed to a new variety of risks, such as school closure, that hindered their positive development (Fegert et al., 2020). Likewise, new stressors, such as heightened financial insecurity and caregiving burdens, increased parental stress and exacerbated parents' emotional responses towards their children's behavior. Together, these new factors undermined normative family functioning and effective parenting (Prime et al., 2020).

The ability to navigate challenges to maintain **adjustment** requires self-control, an ability to regulate one's cognitive, emotional, and behavioral reactions to achieve goals and values (Tangney et al., 2004). Although many studies have examined the association between adolescent self-control and adjustment, the intergenerational transmission model of self-regulation proposes that parental self-control plays a more fundamental role in adolescent adjustment than young people's own self-control (Bridgett et al., 2015). Based on this model, the present longitudinal study aims to examine an underexplored idea that parental self-control aids adolescent adjustment sequentially through parents perceiving themselves to have lower stress levels, exercising more mindful parenting, and enhancing adolescent self-control. Moreover, we include both maternal and paternal self-control and explore whether their self-control predicts adolescent adjustment in a similar or different pattern.

Overview of the Intergenerational Transmission Model of Self-Regulation

The focus of the intergenerational transmission model of self-regulation is to delineate

how parental self-control is transmitted to their offspring through three pathways (Bridgett et al., 2015). First, *prenatal pathways* consider that pregnant mothers with strong self-control are more able to modulate stress during pregnancy to prevent prenatal stressful process unfolding. This protects offspring's hypothalamic-pituitary-adrenal axis and neurobiological underpinnings responsible for self-control. Second, the *genetic only pathway* posits that offspring carry certain genes passed down by parents that modulate the structural and functional development of neurobiological mechanisms of self-control. Third, the *socialization only pathway* posits that parental self-control predicts child self-control via modulating proximal developmental contexts, such as effective parenting and a variety of other psychological (e.g., family stress) and physical (e.g., home chaos) factors related to child self-control. This model also posits that offspring's self-control is a proximal factor responsible for their adjustment. These tenets together indicate that parental self-control may aid child adjustment sequentially through biological/environmental underpinnings and child self-control.

Whilst little research has directly examined the prenatal pathways and the genetic only pathway, an increasing number of studies have begun to examine how parental self-control is linked to child adjustment through proximal developmental contexts and child self-control. Meldrum et al.'s (2015) cross-sectional study found that parents' low self-control was sequentially associated with young adult offending through parental socialization and young adults' low self-control. Using longitudinal data, Meldrum et al. (2018) further found that maternal self-control predicted young **children's** aggression sequentially through mothers' ineffective parenting and child self-control. However, such a chain mediation effect was not found for fathers. Although these studies provide partial support for the *socialization only pathway*, several gaps have been observed. First, the studies usually examined parenting as a mediator linking parental self-control and child self-control, rarely considering the

mediation effect of other factors within the proximal developmental contexts. Second, prior studies did not consider the spillover effect --- whether one parent's self-control affects their spouse's parenting and related behaviors. Third, the existing studies did not control for the baseline of child self-control and adjustment, thus hindering the inference of causality.

To fill these gaps, this study aims to examine the role of parents' perceived stress and mindful parenting in connecting parental self-control and child self-control and adjustment. These variables are particularly relevant during the COVID-19 pandemic period when parents perceived considerable stress and many found it difficult to remain calm in the face of their children's challenging behavior (Prime et al., 2020). In addition, we also examine actor-partner effects and control for the baseline of child self-control and adjustment to achieve robust and nuanced findings.

Parental Self-Control and Parents' Perceived Stress and Mindful Parenting

Parental Self-Control and Parents' Perceived Stress

Whilst literature has suggested that there may be a reciprocal association between self-control and stress (Situ et al., 2021; Tangney et al., 2004), we will focus on the pathway from parental self-control to perceived stress, as proposed by the intergenerational transmission model of self-regulation. This pathway is obvious, as self-control failure is the hallmark of many disorders detailed in DSM-5, such as the entire cluster of diagnoses that fall under the umbrella of "Impulse Control Disorders" (American Psychiatric Association, 2013). Moreover, people with good (poor) self-control tend to use more (fewer) effective coping strategies, which, in turn, determine the extent to which people feel stressed and how well they manage stress (Boals et al., 2011). Many psychological and psychophysiological studies have found that people with strong self-control perceive less stress (Flesia et al., 2020; Hendrawan et al., 2012; Nielsen et al., 2020; Tangney et al., 2004).

Parental Self-Control and Parents' Mindful Parenting

Mindful parenting is defined as providing intentional, non-judgmental, and present-centered attention to parent-child interactions (Bögels et al., 2010). In essence, mindful parenting is not exactly equivalent to parenting practices. Whilst parenting practices are usually directed toward the child, mindful parenting delineates the extent to which parents are able to treat their own and their children's behavior non-judgmentally, distance themselves from negative emotions effectively, and execute calm and consistent parenting practices (Dumas, 2005). Parental self-control plays a crucial role in mindful parenting. It is normal for parents to feel negative emotions when they are confronted by their children's challenging behavior. However, self-control enables parents to pause before they react to such behavior, and allows them to avoid negative cycles of reactivity and maladaptive parenting interactions. As such, self-control allows parents to maintain parenting practices that align with their parenting values and goals (Duncan et al., 2009; Moreira & Canavarro, 2020). Although little research has directly examined the link between parental self-control and parents' mindful parenting, a few studies do support the link. For example, mothers of newborn babies and adolescents who find it difficult to regulate their emotions show poor mindful parenting (Caçador & Moreira, 2021; Gouveia et al., 2019). Parents with depressive moods (a proxy of emotional dysregulation), or those who use destructive interparental conflict tactics (a proxy of conflictual dysregulation), are less likely to be mindful when parenting their children (Cheung et al., 2021; Cheung & Chung, 2022).

Parents' Perceived Stress and Mindful Parenting

When parents experience significant parenting or non-parenting stress, they are prone to lapses in mindful attention during interactions with children, and so are more likely to rely on automatic hostile, coercive, and ineffective parenting behavior (Cheung & Wang, 2022; Parent et al., 2021). By contrast, research has found that mindful parenting is conducive to parent-child interactions and lessens both parenting and non-parenting stress (Corthorn &

Milicic, 2016; Fernandes et al., 2021; Moreira & Canavarro, 2018). In other words, parents' perceived stress and mindful parenting may be reciprocal. As such, we treat them as parallel processes linking parental self-control and child self-control in lieu of predisposing one to precede the other.

Actor-Partner Effects

The family system theory posits that the relationship, mood, or emotion of a family member may spill over to other family members as a unit (Cox & Paley, 2003). As such, we do not simply assume that paternal and maternal self-control are related to their own stress and mindful parenting, but we also examine whether one parent's self-control has implications for their spouse's stress and mindful parenting. This idea has not been directly examined, but a few relevant studies lend support to it. For instance, Cheung and Chung (2022) found that both parents' destructive interparental conflict tactics were not just related to their own mindful parenting, but also to their spouse's. An actor-partner independence model is an appropriate approach to examine the above idea. To better test actor-partner effects, we also control for the relations between adolescent self-control and their parents' perceived stress and mindful parenting. This is because prior studies have found that children with poor self-control are likely to exhibit challenging behavior that may further elicit parents' perceived stress and negative parenting (Li et al., 2019; Speyer et al., 2022).

Parents' Perceived Stress/Mindful Parenting and Adolescent Self-Control

Parents' Perceived Stress and Adolescent Self-Control

The family stress model posits that when parents are stressed, they will tend to use fewer positive parenting practices, use more coercive discipline, and create an adverse climate within the family, all of which contribute to poor child adjustment (Ferreira et al., 2022; Masarik & Conger, 2017; McRae et al., 2021). Over the past two years, parents worldwide have experienced even higher levels of stress than normal because of the COVID-

19 pandemic. Contextual risks, such as financial insecurity and caregiving burdens, permeate the structures and processes of the family systems. As such, these impact parental well-being, parent-child relationships, and child psychosocial functioning (Prime et al., 2020). Studies have found the negative family atmosphere and relationships within the family aroused by parents' perceived stress may translate into poor adolescent self-control (Ferreira et al., 2022; Higgins et al., 2011; for a review, see Li et al., 2019).

Parents' Mindful Parenting and Adolescent Self-Control

Duncan et al.'s (2009) mindful parenting model suggests that mindful parenting is the foundation for good practices of child management (e.g., consistent discipline), positive parenting practices (e.g., calm communication), and increased parent-child mutual positive affection. All of these contribute to children's positive outcomes such as self-control. For instance, Cheung et al.'s (2021) cross-sectional study found the mindful parenting of both mothers and fathers was associated with young children's self-regulation, which in turn was related to children's internalizing, externalizing, and prosocial behaviors. Moreira and Canavarro's (2020) cross-sectional study found that the mindful parenting of mothers was related to lower levels of emotion dysregulation in middle adolescents through adolescent psychological inflexibility and self-compassion. However, few longitudinal studies have been conducted to examine the link between parents' mindful parenting and adolescent self-control, especially considering both fathers and mothers simultaneously.

Fathers' vs. Mothers' Perceived Stress and Mindful Parenting in Adolescent Self-Control

Fathers and mothers often play different roles in child rearing. Fathers are usually the main breadwinner while mothers are usually the main caregiver, especially in contemporary Chinese families (Li, 2020). Such role differences have implications for child adjustment outcomes, such as self-control. Meldrum et al. (2016) found that mothers', but not fathers', ineffective parenting was related to low self-control in young children. Sun et al. (2022)

found that close mother-child bonding was related to self-control in both early and middle adolescents, but father-child bonding was related to self-control in early but not in middle adolescents. To the best of our knowledge, no research has directly examined whether mothers' and fathers' perceived stress and mindful parenting play a similar or different role in adolescent self-control. This study also aims to explore these nuanced patterns.

Adolescent Self-Control and Adjustment

Adolescent adjustment has long been studied from a deficit perspective (Arnett, 1999). Influenced by positive psychology, however, studies have now recognized that good functioning in youth should be reflected by both the absence of problems and the presence of well-being (Antaramian et al., 2010; Greenspoon & Saklofske, 2001). Whilst past studies that tested the intergenerational transmission model of self-regulation focus mainly on negative outcomes (Meldrum et al., 2015; 2018), this study examines whether parental self-control simultaneously contributes to both positive outcomes in adolescents, such as life satisfaction, and negative outcomes, such as psychological difficulties.

Over the past two years, young people have encountered more challenges and stressors than normal because of the COVID-19 pandemic and social polarization. Individuals with good self-control are more able to navigate challenges and stressors, as self-control prevents the development of a negative cycle between an individual's impulsive reactions towards challenges and stressors and their associated negative outcomes (Tangney et al., 2004). Self-control also facilitates thriving, as individuals with good self-control are more likely to achieve goals and other important things, such as health and wealth, that foster a good life (Hofmann et al., 2014). Studies have consistently found that young people with good self-control have better mental health and well-being both during ordinary periods and amidst the pandemic (Dou et al., 2019; Mancinelli et al., 2021; Wen et al., 2022).

The Present Study

Although parental self-control may contribute to adolescent self-control and adjustment through proximal developmental contexts, a deeper examination is still warranted, especially considering both paternal and maternal self-control simultaneously in longitudinal research. To this end, we plan to explore the actor-partner effects of paternal and maternal self-control on their perceived stress and mindful parenting. We will also explore whether fathers' and mothers' perceived stress and mindful parenting play a different role in contributing to adolescent self-control. Drawing upon the intergenerational transmission model of self-regulation, we examine two mediation paths in this study. (1) Does maternal and paternal self-control contribute to adolescent self-control through parents' perceived stress and mindful parenting? (2) Does maternal and paternal self-control facilitate adolescent adjustment (i.e., psychological difficulties and life satisfaction) through parents' perceived stress and mindful parenting and adolescent self-control (Figure 1). Regarding the first path, we hypothesized that maternal and paternal self-control would positively predict adolescent self-control one year later through their own and their spouse's lower levels of perceived stress, and better mindful parenting. Regarding the second path, we hypothesized that maternal and paternal self-control would facilitate adolescent adjustment *sequentially* through their own and their spouse's lower levels of perceived stress/better mindful parenting and adolescents' improved self-control. Moreover, since little research has directly examined whether mothers' and fathers' perceived stress and mindful parenting play a differential role in adolescent self-control, this issue was treated as an exploratory question.

Method

Participants and Procedure

Adolescents in 7th grade and their parents were recruited from two middle schools in Guangzhou, a city located in Southern China. This study was part of a larger study that examined adolescent well-being from the bioecological perspective. No specific sample sizes

were set prior to starting the recruitment, but we sought to recruit a sample large enough to support our intended analyses. Given that the current study contained 10 main variables as illustrated in Figure 1, we considered at least 100 families would be sufficient based on a subject to variable ratio of 10:1 (Tanaka, 1987). In November-December 2020 (Time 1, T1), 524 families participated in the study. We only included intact families with fathers and mothers married and living together with their adolescent children, resulting in 426 families in the final analysis. Among them, 426 adolescents ($M_{\text{age}} = 11.6$ years, $SD = 0.50$, 53.5% boys), 262 fathers ($M_{\text{age}} = 42.52$ years, $SD = 4.06$), and 313 mothers ($M_{\text{age}} = 42.52$ years, $SD = 4.06$) provided complete data for this study. Of note, 228 families had data from both father and mother. One year later (Time 2, T2), 375 adolescents (54.2% boys) provided complete survey data again.

We conducted attrition analyses to examine the differences in study variables at T1 between adolescents who took part in the study at both time points and those who dropped out at T2. The results showed that the two groups did not differ in all variables, including adolescent sex ($\chi^2(1) = 0.09, p = .772$), age ($t(413) = -1.32, p = .188$), family socioeconomic status (SES; $t(226) = 0.02, p = .983$), paternal ($t(260) = 0.75, p = .453$) and maternal ($t(311) = -1.24, p = .215$) self-control, fathers' ($t(260) = -1.94, p = .054$) and mothers' ($t(311) = -0.17, p = .867$) perceived stress, fathers' ($t(260) = 0.82, p = .411$) and mothers' ($t(311) = 0.19, p = .847$) mindful parenting, adolescent self-control ($t(414) = 1.12, p = .264$), psychological difficulties ($t(414) = -1.48, p = .140$), and life satisfaction ($t(418) = 1.07, p = .287$). Moreover, the results of Little's MCAR test suggested that the missing data were completely at random ($\chi^2(284) = 290.30, p = .386$). These findings suggested that the missing data were not likely to bias the results. In addition, we also compared T1 data between adolescents with both parents joining this study and those with only one parent joining the study. No significant differences were found, except that adolescents who had both parents to join reported higher self-control

than those who had only one parent to join ($t(414) = 2.61, p = .009$, Cohen's $d = 0.257$).

This study was approved by the ethics committee from the first author's institution. Parental consent and adolescent assent were obtained. Trained master students majoring in psychology collected data from adolescents during regular class hours in the classroom, with the help of head teachers to maintain classroom discipline. As soon as students finished, the host collected the questionnaires and gave each student a letter to bring home for their parents. Inside the letter was an invitation letter with a QR code. By scanning the QR code, fathers and mothers were directed to an online survey where they were asked to fill in a battery of questionnaires. Voluntary participation was stressed. The measurement procedure of collecting data from adolescents was identical at both time points.

Measures

Parental and Adolescent Self-Control

Adolescents, fathers, and mothers completed the Brief Self-Control Scale (BSCS, Tangney et al., 2004) to assess their own self-control. Fathers and mothers completed the scale at T1, whilst adolescents completed the scale at both T1 and T2. This scale has 13 items rated on a 5-point Likert scale (from 1 = *not like me at all* to 5 = *very much like me*). A higher mean score indicates better self-control. A sample item is "I am good at resisting temptation". This scale has been widely used in adolescents and adults in the Chinese context, showing good internal consistency reliability (e.g., Situ et al., 2016). In this study, Cronbach's alpha was 0.82 and 0.80 for paternal and maternal self-control respectively, and was 0.81, and 0.85 for adolescent self-control at T1 and T2 respectively.

Parents' Mindful Parenting

Fathers and mothers completed the Bangor Mindful Parenting Scale (BMPS; Jones et al., 2014) to assess their mindful parenting at T1. This scale includes 15 items consisting of five domains, namely *acting with awareness*, *non-reactivity*, *non-judgement*, *observing*, and

describing. Each item was rated on a 4-point Likert scale (from 0 = *never true* to 3 = *always true*). Of note, the three items of the non-judgement subscale are negatively worded, and we thus reversed these items to make them in the same direction as other subscales. However, we found that these reversed items were negatively related to the total score of the scale. Thus, we deleted these three items. Previous research also found this issue and deleted related items in the non-judgement subscale (Cheung et al., 2021). The final BMPS contained 12 items in this study. A sample item is “I pay attention to how my emotions affect the way I act towards my child”. A higher mean score indicated better mindful parenting. Cronbach’s alpha was 0.76 and 0.78 for fathers’ and mothers’ mindful parenting respectively.

Parents’ Perceived Stress

Fathers and mothers completed the Perceived Stress Scale (PSS-4; Leung et al., 2010) to assess how much stress they perceived at T1. The scale consists of 4 items rated on a 5-point Likert scale (from 0 = *never* to 4 = *very often*). A sample item is “Difficulties were piling up so high that you could not overcome them?” A higher mean score indicates more perceived stress. Cronbach’s alpha was 0.72 and 0.79 for fathers and mothers respectively.

Adolescent Psychological Difficulties

Adolescents answered 20 items of the Strengths and Difficulties Questionnaire (SDQ; Goodman et al., 1998) to assess their psychological difficulties in terms of emotional problems, conduct problems, hyperactivity, and peer problems at T1 and T2. Each item was rated on a 3-point Likert scale (from 0 = *not true* to 2 = *certainly true*). A sample item is “I get very angry and often lose my temper”. A higher mean score indicates more psychological difficulties. Cronbach’s alpha was 0.80 for both time points.

Adolescent Life Satisfaction

Adolescents completed the Satisfaction with Life Scale (SWLS; Diener et al., 1985) to assess their life satisfaction at T1 and T2. This scale has 5 items rated on a 7-point Likert

scale (from 1 = *strongly disagree* to 7 = *strongly agree*). A sample item is “In most ways my life is close to my ideal”. A higher mean score indicates stronger life satisfaction. Cronbach’s alpha was 0.84 and 0.85 for T1 and T2 respectively.

Covariates

Several demographic variables were measured as covariates. Adolescents reported their age and sex (1 = *male*, 2 = *female*). Fathers and mothers reported their own educational levels (0 = *no former education*, 1 = *primary school*, 2 = *middle/high school*, 3 = *college diploma or equivalent*, 5 = *university bachelor’s degree or above*) and annual income (0 = *no income*, 1 = *\$1-\$10,000*, 2 = *\$10,001-\$20,000*, 3 = *\$20,001-\$30,000*, 4 = *\$30,001-\$40,000*, 5 = *\$40,001-\$50,000*, 6 = *\$50,001 or above*). We calculated a composite score for family SES to reduce the complexity of the model by standardizing and averaging fathers’ and mothers’ educational levels and annual income. A higher score indicated higher family SES.

Data Analyses

The study was not preregistered. Relevant data and code can be obtained from the first author upon request. We first conducted descriptive statistics and correlation analyses in SPSS 23.0. Then we performed a path analysis in Mplus 8.3 to test the two hypotheses. As for the associations between T1 parental self-control and T1 parents’ perceived stress and mindful parenting, we adopted an actor-partner interdependence model (Cook & Kenny, 2005) to examine both actor effects (e.g., *maternal* self-control → *mothers’* perceived stress) and partner effects (e.g., *maternal* self-control → *fathers’* perceived stress). We controlled for adolescent age, sex, self-control, and family SES at T1 by regressing these covariates on the mediators and outcomes. Missing data were handled with full-information maximum likelihood (FIML; Enders, 2001). We used bootstrap technique ($N = 5,000$) to judge the significance of the mediation effects (Preacher & Hayes, 2008). If the 95% confidence interval (CI) excluded zero, the mediation effect would be deemed tenable.

Results

Bivariate Correlations between Study Variables

The results showed that *paternal self-control* was positively related to fathers' mindful parenting and negatively related to fathers' and their spouses' perceived stress. *Maternal self-control* was positively related to mothers' and their spouses' mindful parenting and negatively related to mothers' and their spouses' perceived stress. Moreover, *fathers' perceived stress* was negatively linked to adolescent self-control at T2. By contrast, *mothers' mindful parenting* was positively related to adolescent self-control at T2. *Adolescent self-control* at T2 was positively related to life satisfaction but negatively related to psychological difficulties at T2. Detailed results can be found in Supplement Table 1.

The Associations between Parental Self-Control, Parents' Perceived Stress and Mindful Parenting, and Adolescent Self-Control and Adjustment

The model showed a good fit to the data ($\chi^2(20) = 24.092$, $p = .238$, $RMSEA = 0.022$, $CFI = 0.995$, $TLI = 0.981$) and explained a substantial proportion of variance in the mediators and outcomes ($R^2 = 24\% - 44\%$).

Parental Self-Control and Parents' Perceived Stress and Mindful Parenting

As shown in Table 1, family SES was significantly related to better mindful parenting for both mothers and fathers. After controlling for covariates, the results showed that all actor effects were significant. That is, paternal self-control was negatively linked to fathers' perceived stress and positively related to their mindful parenting. Similar patterns were found for mothers. No significant partner effects were found, implying that parental self-control was only linked to their own, but not to their spouses', perceived stress and mindful parenting.

Parents' Perceived Stress and Mindful Parenting and Adolescent Self-Control

As shown in Table 1, after controlling for T1 adolescent self-control and covariates, T1 mothers' mindful parenting significantly predicted adolescent self-control at T2, but

perceived stress did not. These results suggest that mothers who exercised better mindful parenting might better nurture adolescent self-control. Moreover, after controlling for T1 adolescent self-control and covariates, T1 fathers' perceived stress predicted T2 adolescent self-control at a marginally significant level ($p = .056$), but mindful parenting did not. These results suggest that there might be a trend that fathers who perceived lower levels of stress facilitate adolescent self-control.

Adolescent Self-Control and Adjustment

As shown in Table 1, after controlling for T1 adjustment and covariates, adolescent self-control was negatively related to psychological difficulties and positively associated with life satisfaction at T2. These findings suggest that adolescents with strong self-control had better psychological adjustment.

Associations between Self-Control, Perceived Stress, and Mindful Parenting at T1

As shown in Table 1, paternal self-control was positively related to maternal self-control, but neither paternal nor maternal self-control was related to adolescent self-control. Furthermore, fathers' and mothers' perceived stress was negatively related to their own mindful parenting. In addition, fathers' perceived stress was positively related to mothers' perceived stress and negatively related to mothers' mindful parenting. However, mothers' perceived stress was not significantly related to fathers' mindful parenting. Fathers' mindful parenting was not significantly related to mothers' mindful parenting, either.

The Mediation Effects of Parents' Perceived Stress and Mindful Parenting in the Links between Parental Self-Control and Adolescent Self-Control

As shown in Table 2, two significant mediation effects emerged. First, T1 fathers' perceived stress mediated the link between T1 paternal self-control and T2 adolescent self-control. This indicates that fathers with higher levels of self-control tend to perceive lower levels of stress, which in turn improves adolescent self-control. Second, T1 mothers' mindful

parenting mediated the link between T1 maternal self-control and T2 adolescent self-control. This indicates that mothers who had higher levels of self-control tend to exercise mindful parenting better, which in turn improves adolescent self-control. Kenny (2021) proposed that 0.01 (i.e., $0.1 * 0.1$), 0.09 (i.e., $0.3 * 0.3$), and 0.25 (i.e., $0.5 * 0.5$) could represent small, medium, and large effect sizes for mediation effects constructed by the standardized coefficients for paths a (i.e., $x \rightarrow m$) and b (i.e., $m \rightarrow y$). In this regard, the effect sizes for the significant mediation effects mentioned above were close to medium.

Chain Mediation Effects of Parents' Perceived Stress/Mindful Parenting and Adolescent Self-Control in the Links between Parental Self-Control and Adolescent Adjustment

As shown in Table 3, fathers' lower levels of perceived stress and adolescents' improved self-control sequentially mediated the link between T1 paternal self-control and T2 adolescent psychological difficulties, as well as the link between T1 paternal self-control and T2 adolescent life satisfaction. Moreover, the results also show that mothers' better mindful parenting and adolescents' improved self-control sequentially mediated the link between T1 maternal self-control and T2 adolescent psychological difficulties, as well as the link between T1 maternal self-control and T2 adolescent life satisfaction. These findings suggest that fathers with better self-control perceive lower levels of stress, which then facilitates adolescent self-control, further reduces their psychological difficulties, and increases their life satisfaction. By contrast, mothers with better self-control tend to exercise mindful parenting, which then improves adolescent self-control, further reduces their psychological difficulties and increases their life satisfaction. *Of note, we were not able to evaluate effect sizes for these chain mediation effects, as characterizing effect sizes in multiple sequential mediation models has been less clearly understood than in traditional mediation models.*

Robust Analysis

The intergenerational transmission model of self-regulation does not propose a direct

effect of parental self-control on child adjustment, but it would be worth exploring whether including such direct effects would fit the data better. Thus, we added four direct effects of paternal and maternal self-control at T1 on adolescent psychological difficulties and life satisfaction at T2. The model fit was $\chi^2(16) = 20.729$, $p = .189$, $RMSEA = 0.026$, $CFI = 0.994$, $TLI = 0.973$. Results of differences in chi-square test showed that adding these direct effects did not significantly improve the fit of the proposed model $\Delta\chi^2(4) = 3.363$, $p = .499$. Moreover, the four direct effects were insignificant (β T1 paternal self-control \rightarrow T2 psychological difficulties = .009, $SE = .051$, $p = .862$; β T1 maternal self-control \rightarrow T2 psychological difficulties = -.085, $SE = .045$, $p = .058$; β T1 paternal self-control \rightarrow T2 life satisfaction = .022, $SE = .059$, $p = .708$; β T1 maternal self-control \rightarrow T2 life satisfaction = .019, $SE = .051$, $p = .710$). This implies that the original model was more parsimonious.

Given that the links between parental self-control and parents' perceived stress and mindful parenting at T1 and the links between adolescent self-control and adjustment outcomes at T2 were cross-sectional, we tested a competing model by switching the order of variables within the same time points (i.e., T1 perceived stress and mindful parenting \rightarrow T1 parental self-control \rightarrow T2 adolescent adjustment \rightarrow T2 adolescent self-control). The model fit was $\chi^2(24) = 38.804$, $RMSEA = 0.038$, $CFI = 0.979$, $TLI = 0.947$. Results of differences in chi-square test showed that this model showed a poorer fit than the original model, $\Delta\chi^2(4) = 14.712$, $p = .005$. This suggested that the original model fit the data better.

Discussion

To maintain optimal psychological adjustment is a crucial developmental task for adolescents. Many studies have documented the associations between adolescent self-control and adjustment, but little research has examined the role of parental self-control. Drawing upon the intergenerational transmission model of self-regulation (Bridgett et al., 2015), we tested two mediation paths: (1) does parental self-control facilitate adolescent self-control

through parents' perceived stress and mindful parenting? And (2) does parental self-control facilitate adolescent adjustment sequentially through parents' perceived stress/mindful parenting and adolescent self-control? Our findings supported these paths in a nuanced way. Specifically, paternal self-control facilitated adolescent adjustment sequentially through fathers' lower levels of perceived stress and adolescents' improved self-control. By contrast, maternal self-control facilitated adolescent adjustment sequentially through mothers' better mindful parenting exercise and adolescents' improved self-control. To the best of our knowledge, this study was among the first to conduct a deep examination of the intergenerational transmission model of self-regulation, providing evidence for the differential role of parental self-control in facilitating adolescent self-control and adjustment. Several findings warrant discussion.

First, paternal and maternal self-control were related to parents' own perceived stress and mindful parenting. These results are not surprising, as many studies have shown that individuals with good self-control tend to cope with stress and maintain the use of positive parenting (Flesia et al., 2020; Nielsen et al., 2020; Prinzie et al., 2009; Tangney et al., 2004). Studies have considered self-control is required to exercise and maintain mindful parenting (Duncan et al., 2009; Moreira & Canavarro, 2020), but this idea is more conceptual than empirical. The present study also provides important empirical support to the idea that good self-control is important to mindful parenting for both fathers and mothers. These findings are consistent with previous relevant studies that examined the associations between emotional and conflictual dysregulation and parental mindful parenting (Caçador & Moreira, 2021; Cheung et al., 2022; Cheung & Chung, 2022; Gouveia et al., 2019). We also examined the extent to which parental self-control was related to their spouses' perceived stress and mindful parenting. However, the current findings suggest that spouses' self-control did not add incremental variance to parent's own perceived stress and mindful parenting. A possible

reason may be due to self-report bias. Another explanation could be because parents with low self-control are likely, but not absolutely, to encounter more problems, and thus a parent's self-control per se does not relate to their partner's stress and mindful parenting. Instead, when a parent encounters distress due to low self-control, this will likely spread within the family and affect other family members. This explanation is partially supported by the findings shown in Table 1, such that fathers with low self-control perceived more stress which was negatively related to their and their spouses' mindful parenting.

Second, fathers' but not mothers' perceived stress predicted adolescent self-control one year later. This difference might be explained by the *fathering vulnerability hypothesis* (Cummings et al., 2010). This hypothesis proposes that, compared to mothers, fathers are more susceptible to stress and negativity, and their stress is more likely to spill over to other family members. In light of this view, although both fathers and mothers are affected by stress, fathers are more likely to spread such stress in the form of negative parenting toward their children than mothers. For instance, research has found that fathers who experience stress tend to use more psychological control toward their children (Leung et al., 2022), a well-known negative parenting practice adverse to the development of adolescent self-control (Li et al., 2019). In particular, influenced by the long-held traditional concept "loving mother, strict father", Chinese fathers are more prone to adopting harsh parenting than mothers (Ping et al., 2022). A possible reason for the insignificant association between mothers' perceived stress and adolescent self-control is that mothers' stress may play an indirect role (e.g., through parenting) in child adjustment, given that they are the main caregiver in the family. Since we did not directly measure parenting in this study, research may revisit whether parenting mediates the link between mothers' (and also fathers') perceived stress and adolescent self-control in the future, as suggested by the family stress model (Masarik & Conger, 2017). In addition, the data was collected during the COVID-19 pandemic. At the

time of data collection, China had implemented strict anti-COVID measures, which brought with them substantial negative economic consequences, such as reduced salary and increased rate of unemployment. Such changes in the macroeconomic situation had led to an increase in mental health issues in Chinese fathers but not in mothers (Cheung et al., 2022).

Third, mothers' but not fathers' mindful parenting predicted adolescent self-control. This difference might be because Chinese mothers are still the main caregivers and have more daily interactions with their children compared to fathers (Li, 2020). Correspondingly, mothers have higher chances of being evoked by their children's challenging behavior and being mindful during interactions with children is more important for mothers than fathers to keep calm and maintain their parenting goals and values to develop children's self-control. Research has found that as Chinese mother-child dyads interact more frequently than father-child dyads, there might be more sources of conflict within mother-child dyads (Feng et al., 2019), especially during the transition to early adolescence (Yan et al. 2019).

Fourth, we found that increase in self-control in adolescents were related to better adjustment at T2. Such findings are consistent with many studies that have well supported the important role of child self-control in their adjustment before and during the pandemic (Dou et al., 2019; Mancinelli et al., 2021; Wen et al., 2022).

Finally, we also observed significant associations between family SES and mindful parenting. An explanation might be because parents with higher SES tend to have higher academic attainment, which helps them formulate and maintain positive parenting beliefs and expectations during daily parenting (Davis-Kean et al., 2021).

Implications

Theoretically, this study lends crucial support to some of the core tenets suggested by the intergenerational transmission model of self-regulation. In particular, the model does not differentiate whether maternal and paternal self-control shape adolescent self-control and

adjustment via different pathways. Indeed, the authors of the model acknowledge that most of the evidence used to build up the model was based mainly on the findings from mothers (Bridgett et al., 2015). The current findings suggest that paternal and maternal self-control appears to predict adolescent self-control and adjustment through different pathways.

Practically, the current findings inform several avenues to improve adolescent adjustment. First, adolescent self-control was a proximal factor related to better adjustment, suggesting that enhancing adolescent self-control is a crucial way to facilitate adjustment. Although some views believe that self-control is less likely to change after ten years old (Gottfredson & Hirschi, 1990), recent neuroimaging research has shown that the brain regions responsible for better self-control do not mature until mid-20s (Casey & Caudle, 2013). These findings suggest that adolescence is still a critical time window for young people to develop self-control. Research has found that training programs, such as school-based mindfulness programs, are a helpful way to promote young people's self-control (Liu et al., 2022). Second, the present results suggest that parental self-control also plays a role in adolescent self-control and adjustment. Some may argue that adult self-control may not be as easy to improve as younger people's. Nevertheless, as fathers' perceived stress and mothers' mindful parenting mediated the links between their respective self-control and adolescent self-control and adjustment, these mediators may be targeted. For instance, some parenting programs, such as the Triple-P and mindful parenting programs, not only help to mitigate parental stress and enhance mindful parenting, but their beneficial effects will also extend to adolescent self-control and adjustment (Potharst et al., 2021; Sanders, 2012).

Limitations

First, although we used a two-wave longitudinal design and controlled for the baseline levels of adolescents' self-control and adjustment, the links between parental self-control and their perceived stress/mindful parenting at T1 and the links between adolescents' self-control

and their adjustment at T2 were still cross-sectional. Even if our proposed model showed a better fit than the competing model, it still precludes strong inference of causal relationships. Future studies may include more assessment waves to test the model. Second, due to the COVID-19 pandemic, we could only collect data from a convenient sample in one city in mainland China, thus limiting the generalizability of the findings to other regions of China. This is particularly true for other cultures given that parent-child interaction differs across cultures (Bornstein, 2012). Future research may revisit this topic with a more representative sample. Third, this study only included data from intact families. Due to incomplete data from the non-intact families and small sample size for such families, it might not be suitable to compare whether the model differs between intact and non-intact families. This idea can be revisited in the future with more balanced samples. Lastly, the intergenerational transmission model of self-regulation proposes three pathways from parental self-control to offspring's self-control and adjustment. We only examined the socialization only pathways in this study. Since a single pathway cannot fully explain how parental self-control is linked to adolescent self-control, studying the unexamined mediators (e.g., biological stress processes unfolding to affect adolescent self-control) is a promising avenue in future research.

Conclusion

Self-control is a crucial asset that assists young people in navigating changes and challenges to maintain optimal psychological adjustment. This study reveals that paternal self-control facilitates adolescent self-control and adjustment through fathers' lower levels of perceived stress, whilst maternal self-control facilitates adolescent self-control and adjustment through mothers' better mindful parenting. These findings add to our understanding of how adolescent self-control develops in relation to parental self-control, and how good self-control within the family works to enhance adolescent psychological adjustment.

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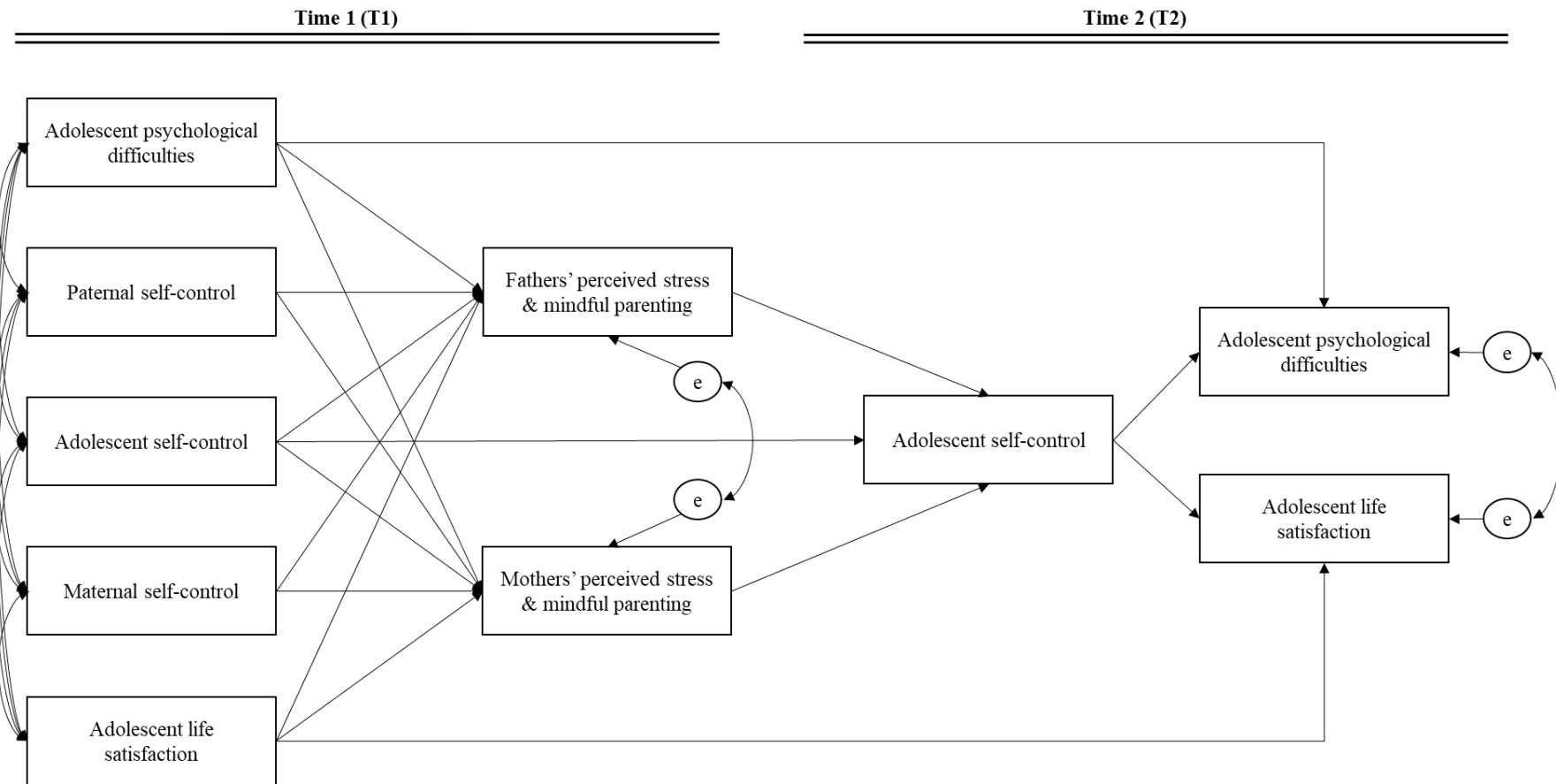


Figure 1. Conceptual Model of The Association Between T1 Parental Self-control and T2 Adolescent Adjustment Sequentially Through Parents' Perceived Stress and Mindful Parenting and Adolescent Self-control

Note: The effects of covariates (i.e., adolescent sex and age and family SES) on the mediators and outcomes were controlled for but not shown in the figure for simplicity.

Fathers' and mothers' perceived stress and mindful parenting are four parallel mediators but collapsed into two categories in the figure for simplicity.

Table 1 *Summary of the Path Coefficients of the Mediation Model*

Path	<i>Bias-Corrected Bootstrapped Estimates for the Effects</i>			
	β	SE	p	95% CI
Dependent variable: T1 fathers' perceived stress				
T1 Paternal self-control	-.57	.05	< .001	[-.657, -.459]
T1 Maternal self-control	-.07	.06	.235	[-.185, .049]
T1 Adolescents' self-control	.02	.07	.792	[-.123, .148]
T1 Adolescent age	.00	.05	.978	[-.095, .104]
T1 Adolescent sex	.08	.05	.105	[-.023, .177]
T1 Family SES	.04	.05	.424	[-.062, .154]
Dependent variable: T1 fathers' mindful parenting				
T1 Paternal self-control	.42	.06	< .001	[.303, .521]
T1 Maternal self-control	.08	.06	.210	[-.041, .201]
T1 adolescents' self-control	-.12	.07	.115	[-.250, .038]
T1 Adolescent age	-.02	.06	.688	[-.140, .088]
T1 Adolescent sex	.01	.06	.895	[-.107, .114]
T1 Family SES	.18	.07	.008	[.042, .298]
Dependent variable: T1 mothers' perceived stress				
T1 Paternal self-control	-.11	.07	.121	[-.249, .036]
T1 Maternal self-control	-.46	.06	< .001	[-.567, -.346]
T1 adolescent self-control	.04	.06	.518	[-.085, .166]
T1 Adolescent age	-.01	.05	.877	[-.110, .094]
T1 Adolescent sex	.03	.05	.626	[-.073, .134]
T1 Family SES	.06	.06	.266	[-.054, .166]
Dependent variable: T1 mothers' mindful parenting				
T1 Paternal self-control	.03	.07	.666	[-.111, .170]

T1 Maternal self-control	.42	.05	< .001	[.317, .517]
T1 adolescent self-control	.00	.07	.996	[-.132, .140]
T1 Adolescent age	.00	.05	.951	[-.103, .108]
T1 Adolescent sex	.00	.05	.996	[-.099, .099]
T1 Family SES	.16	.06	.005	[.047, .278]
Dependent variable: T2 adolescent self-control				
T1 Paternal perceived stress	-.12	.06	.056	[-.242, .000]
T1 Paternal mindful parenting	.02	.06	.778	[-.098, .127]
T1 Maternal perceived stress	.07	.06	.267	[-.052, .178]
T1 Maternal mindful parenting	.14	.06	.029	[.011, .256]
T1 Adolescent self-control (baseline)	.50	.04	< .001	[.410, .574]
T1 Adolescent age	-.02	.05	.609	[-.116, .065]
T1 Adolescent sex	-.05	.05	.238	[-.144, .037]
T1 Family SES	.00	.06	.999	[-.118, .119]
Dependent variable: T2 adolescent psychological difficulties				
T2 Adolescent self-control	-.52	.04	< .001	[-.590, -.449]
T1 Adolescent psychological difficulties (baseline)	.30	.05	< .001	[.203, .390]
T1 Adolescent age	-.02	.04	.590	[-.105, .057]
T1 Adolescent sex	-.09	.04	.024	[-.164, -.014]
T1 Family SES	-.01	.06	.904	[-.116, .106]
Dependent variable: T2 adolescent life satisfaction				
T2 Adolescent self-control	.33	.05	< .001	[.228, .421]
T1 Adolescent life satisfaction (baseline)	.36	.05	< .001	[.261, .448]
T1 Adolescent age	-.08	.05	.098	[-.160, .021]
T1 Adolescent sex	-.06	.04	.181	[-.141, .026]
T1 Family SES	.02	.06	.732	[-.098, .131]

Main within-wave associations

T1 paternal self-control \leftrightarrow T1 maternal self-control	.21	.07	.003	[.067, .333]
T1 paternal self-control \leftrightarrow T1 adolescent self-control	.07	.06	.228	[-.047, .186]
T1 maternal self-control \leftrightarrow T1 adolescent self-control	.11	.06	.059	[-.005, .213]
T1 fathers' perceived stress \leftrightarrow T1 fathers' mindful parenting	-.23	.07	.001	[-.366, -.083]
T1 fathers' perceived stress \leftrightarrow T1 mothers' mindful parenting	-.28	.06	< .001	[-.402, -.160]
T1 mothers' perceived stress \leftrightarrow T1 mothers' mindful parenting	-.27	.05	< .001	[-.359, -.159]
T1 mothers' perceived stress \leftrightarrow T1 fathers' mindful parenting	.05	.06	.375	[-.072, .169]
T1 fathers' mindful parenting \leftrightarrow T1 mothers' mindful parenting	.11	.07	.093	[-.018, .239]
T1 fathers' perceived stress \leftrightarrow T1 mothers' perceived stress	.21	.06	.001	[.084, .335]

Table 2 *Summary of Mediation Effects of Parents' Perceived Stress/Mindful Parenting in the Association between Parental Self-control and Adolescent Self-Control*

Mediation Effects	Bias-Corrected Bootstrapped Estimates for the Effects		
	β	SE	95% CI
T1 Paternal self-control \rightarrow T2 Adolescent self-control			
1: T1 PSC \rightarrow T1 PPS \rightarrow T2 ASC	.07	.04	[.001, .143]
2: T1 PSC \rightarrow T1 PMP \rightarrow T2 ASC	.01	.02	[-.041, .055]
3: T1 PSC \rightarrow T1 MPS \rightarrow T2 ASC	-.01	.01	[-.036, .004]
4: T1 PSC \rightarrow T1 MMP \rightarrow T2 ASC	.00	.01	[-.014, .035]
T1 Maternal self-control \rightarrow T2 Adolescent self-control			
5: T1 MSC \rightarrow T1 PPS \rightarrow T2 ASC	.01	.01	[-.003, .038]
6: T1 MSC \rightarrow T1 PMP \rightarrow T2 ASC	.00	.01	[-.006, .018]
7: T1 MSC \rightarrow T1 MPS \rightarrow T2 ASC	-.03	.03	[-.081, .023]
8: T1 MSC \rightarrow T1 MMP \rightarrow T2 ASC	.06	.03	[.005, .115]

Note: PSC = Paternal self-control, MSC = Maternal self-control, ASC = Adolescent self-control, PPS = Fathers' perceived stress, MPS = Mothers' perceived stress, PMP = Fathers' mindful parenting, MMP = Mothers' mindful parenting, CI = Confidence intervals.

Table 3 *Summary of the Chain Mediation Effects of Parents' Perceived Stress/Mindful Parenting and Adolescent Self-Control in the Association between Parental Self-control and Adolescent Adjustment*

Mediation Effects	Bias-Corrected Bootstrapped Estimates for the Effects		
	β	SE	95% CI
T1 Paternal self-control → T2 Adolescent psychological difficulties			
1: T1 PSC → T1 PSS → T2 ASC → T2 APD	-.04	.02	[-.077, -.001]
2: T1 PSC → T1 PMP → T2 ASC → T2 APD	-.00	.01	[-.029, .021]
3: T1 PSC → T1 MSS → T2 ASC → T2 APD	.00	.01	[-.002, .019]
4: T1 PSC → T1 MMP → T2 ASC → T2 APD	-.00	.01	[-.018, .007]
T1 Maternal self-control → T2 Adolescent psychological difficulties			
5: T1 MSC → T1 PSS → T2 ASC → T2 APD	-.00	.01	[-.020, .001]
6: T1 MSC → T1 PMP → T2 ASC → T2 APD	-.00	.00	[-.010, .002]
7: T1 MSC → T1 MSS → T2 ASC → T2 APD	.02	.01	[-.012, .042]
8: T1 MSC → T1 MMP → T2 ASC → T2 APD	-.03	.02	[-.062, -.003]
T1 Paternal self-control → T2 Adolescent life satisfaction			
9: T1 PSC → T1 PSS → T2 ASC → T2 ALS	.02	.01	[.001, .050]
10: T1 PSC → T1 PMP → T2 ASC → T2 ALS	.00	.01	[-.013, .019]
11: T1 PSC → T1 MSS → T2 ASC → T2 ALS	-.00	.00	[-.013, .001]
12: T1 PSC → T1 MMP → T2 ASC → T2 ALS	.00	.00	[-.004, .012]
T1 Maternal self-control → T2 Adolescent life satisfaction			
13: T1 MSC → T1 PSS → T2 ASC → T2 ALS	.00	.00	[-.001, .013]
14: T1 MSC → T1 PMP → T2 ASC → T2 ALS	.00	.00	[-.002, .006]
15: T1 MSC → T1 MSS → T2 ASC → T2 ALS	-.01	.01	[-.028, .007]
16: T1 MSC → T1 MMP → T2 ASC → T2 ALS	.02	.01	[.002, .041]

Note: PSC = Paternal self-control, MSC = Maternal self-control, ASC = Adolescent self-control, APD = Adolescent psychological difficulties, ALS = Adolescent life satisfaction, PSS = Fathers' perceived stress, MPS = Mothers' perceived stress, PMP = Fathers' mindful parenting, MMP = Mothers' mindful parenting, CI = Confidence intervals.