Parents' depressive symptoms and child adjustment: the mediating role of mindful parenting and children's self-regulation

Article

Accepted Version

Parents' Depressive Symptoms and Child Adjustment: The Mediating Role of Mindful Parenting and Children's Self-regulation

Rebecca Y. M. Cheung[1, 2], Wing Yee Cheng[2], Jian-Bin Li[1, 2], Chun Bun Lam[1, 2], and Kevin Kien Hoa Chung[1, 2]

[1] Department of Early Childhood Education, The Education University of Hong Kong

[2]Centre for Child and Family Science, The Education University of Hong Kong

Author Note

Rebecca Y. M. Cheung https://orcid.org/0000-0003-0998-7991

Jian-Bin Li https://orcid.org/0000-0002-8995-3304

Chun Bun Lam https://orcid.org/0000-0002-3195-7919

Kevin Kien Hoa Chung https://orcid.org/0000-0002-8105-7361

Correspondence should be directed to Rebecca Y. M. Cheung, Ph.D., Department of Early Childhood Education, The Education University of Hong Kong, 10, Lo Ping Road, N.T., Hong Kong. E-mail: rymcheung@eduhk.hk. Phone: (852) 2948-8853.

Abstract

Objectives

Parental depression is linked to a myriad of child adjustment outcomes. To identify the potential processes between parents' depressive symptoms and child adjustment in early childhood, this cross-sectional study investigated mindful parenting and children's self-regulation as mediators.

Methods

Participants were 320 Chinese families involving maritally intact mothers, fathers, and children (49.01% girls) from 34.73 to 55.66 months old (M = 46.32, SD = 3.77). Mothers and fathers completed self-report questionnaires assessing parental depressive symptoms, mindful parenting, children's self-regulation, and adjustment outcomes. Children completed a task assessing their self-regulation. A structural equation model was conducted to examine the mediation model cross-sectionally.

Results

The structural equation model indicated that mindful parenting and children's self-regulation mediated the association between parents' depressive symptoms and children's adjustment. Specifically, mothers' and fathers' depressive symptoms were associated with their own, but not their spouses', mindful parenting. Mindful parenting was then associated with children's self-regulation, which was related to internalizing problems, externalizing problems, and prosocial behavior. Differential findings as a function of parents' gender were also indicated.

Conclusions

The present study revealed mindful parenting and children's self-regulation as mediators between parental depressive symptoms and adjustment in early childhood. Both mothers' and

fathers' depressive symptoms were associated with mindful parenting, which was crucial for children's self-regulation, psychosocial adjustment, and behavioral adjustment. These findings inform practitioners about the relevance of parents' depressive symptoms and mindful parenting to children's adjustment in early childhood.

Keywords: parental depressive symptoms, mindful parenting, self-regulation, child adjustment

Parents' Depressive Symptoms and Child Adjustment: The Mediating Role of Mindful Parenting and Children's Self-regulation

Parental depression is linked to a myriad of child adjustment problems, including self-regulation difficulties, internalizing problems, and externalizing problems (Cents et al., 2013; Davé et al., 2008; Letourneau et al., 2019; Pietikäinen et al., 2020; Weissman et al., 1997). From a developmental psychopathology perspective (Cicchetti & Rogosch, 1996), the diversity of pathways toward adjustment and maladjustment calls for explanations over and above the negative effects of parental depression. Since early childhood is crucial for children's later development (Campbell & Ewin, 1990; Fanti & Henrich, 2010), it is particularly important to identify the unfolding processes early on. Despite a longstanding interest in adjustment in early childhood, studies with mindful parenting as a family process are relatively scant, as the topic has only received increasing research attention in recent years (Parent & DiMarzio, 2021). Being an ancient concept (Anālayo, 2021), mindful parenting refers to an integration of mindfulness into parenting practices (Bögels et al., 2010), such as attending to moment-to-moment experience during parent-child interactions (Duncan et al., 2009). Coupled with other correlates such as parents' depressive symptoms, mindful parenting may be vital to the understanding of children's social, emotional, and behavioral functioning (Moreira & Canavarro, 2018).

According to Goodman and Gotlib's (1999) integrative model of risk to children of mothers with depression, mothers' depression is linked to child outcomes via mechanisms including heritability, mothers' maladaptive affect, behavior, and cognitions, poor parenting quality, and children's vulnerabilities in self-regulation. Extending the model to other primary caregivers such as fathers, parents' depressive symptoms predispose children to negative parent-child interaction (Belsky, 1984; Dix & Meunier, 2009) that further influences children's

psychological functioning, such as poor self-regulation and elevated internalizing problems (Cummings et al., 2014; Dunbar et al., 2013). In their seminal review, Downey and Coyne (1990) suggested that the link between parents' depressive symptoms and child adjustment can be explained by social transmission involving parenting. Notably, previous research showed that depressive symptoms predisposed mothers to feel out of control as parents, which, in turn, predicted children's internalizing problems (Coyne & Thompson, 2011). On the contrary, mindful parenting was negatively associated with parents' symptoms of depression and anxiety and was found to be conducive to child adjustment (Han et al., 2021; Henrichs et al., 2021; Parent et al., 2010; Parent & DiMarzio, 2021).

Recent studies revealed that mindful parenting was linked to children's fewer internalizing and externalizing problems (Cheung et al., 2019; Henrichs et al., 2021; Lo et al., 2018; Parent et al., 2010). Examples of mindful parenting practices include listening to oneself and the child with full attention, holding nonjudgmental acceptance, bringing emotional awareness to interactions, developing self-regulation in parenting relationship, and expressing compassion towards oneself and the child. Mindful parenting practices disengage parents from automatic biases and ruminative thoughts in parenting to experiences in the present moment (Duncan et al., 2009). Parents who are mindful are more likely to pause and respond to the needs of their children and themselves, rather than initiating automatic fight, flight, or freeze reactions (Bögels & Restifo, 2013) or maladaptive reactions in parent-child interactions (Ren et al., 2021). With better self-regulation (Cheung & Ng, 2019), mindful parents set an example for children to practice regulatory skills (Sameroff, 2010) that foster better self-regulation, better well-being, and fewer internalizing and externalizing problems (Bögels, et al., 2014; Evans et al., 2020; Moreira et al., 2018; Parent et al., 2016; Zhang et al., 2019). Previous research revealed that

mindful parenting was associated with child adjustment through positive and negative parenting (Parent et al., 2016). Mothers' and fathers' mindful parenting also predicted children's internalizing and externalizing problems via positive parenting practices and parental warmth (Han et al., 2021; Wang et al., 2018). Consequently, mindful parenting promotes positive family dynamics that support children's positive development.

In the context of depression, people with depressive symptoms are less attentive to the present moment and more judgmental of themselves (Beck, 1979; Joormann et al., 2006). As such, parents with a greater level of depression may be less mindful in the parenting context. In a pair of studies to support this argument, investigators reported that mothers with clinically significant symptoms of depression and/or anxiety had a lower level of mindful parenting than did mothers without clinical symptoms (Fernandes et al., 2021; Moreira & Canavarro, 2018). In other samples primarily of mothers, parents with a greater level of depressive symptoms had lower self-regulation in parenting (Moreira et al., 2019) and were less positive in their parenting practices (Parent et al., 2010), thereby substantiating an inverse relation between parental depression and positive parenting.

Although family systems theory (Cox & Paley, 1997) posits that mothers and fathers have differential impact on other family members, investigators generally examined depressive symptoms and mindful parenting in samples of mothers or parents without distinguishing between parental figures. Previous research showed that mothers' depression predicted children's subsequent behavioral and emotional problems at 3.5 years of age (Ramchandani et al., 2005), whereas fathers' depression predicted children's behavioral problems, particularly for boys, even after controlling for mothers' depression. In their 7-year follow-up of the same cohort (Ramchandani et al., 2008), fathers' postnatal depression was associated with six-year-old

children's prosocial behavior and internalizing and externalizing problems. Grounded in theories and empirical findings in parental depression (e.g., Ramchandani et al., 2005; 2008), fathering (Lamb, 1975; Phares & Compas, 1992), and parenting (Belsky, 1984; Dix & Meunier, 2009), mothers' and fathers' symptoms of psychopathology contribute differentially to parent-child dynamics (Cummings et al., 2013; Kane & Garber, 2004) and parenting practices (Cummings et al., 2014; Otto et al., 2016). Parents' depressive symptoms may also be linked to mindful parenting practices as a function of parents' sex.

Thus far, the literature reveals that mindful parenting is influential on children's development and practice of self-regulation (e.g., Evans et al., 2020; Zhang et al., 2019). Self-regulation, in turn, is related to child adjustment (Zhou et al., 2009). More specifically, self-regulation is defined as the processes that serve to modulate reactivity (Rothbart et al., 2011). It is an umbrella term that encompasses elements such as emotional reactivity and effortful control, and can be applied to modulate reactions of different domains such as cognitive/attentional regulation, emotional regulation, and behavioral regulation (Posner & Rothbart, 2000; Rothbart et al., 2011). Adaptive self-regulation is associated with better adjustment outcomes (e.g., fewer internalizing and externalizing problems and more prosocial behavior) in children via several mechanisms. First, children's behavioral reactions towards external stimuli are biologically determined to some extent, with some children being more likely to show more inhibition whereas others less likely to show inhibition or experience negative emotions (Rothbart & Bates, 2006). With these predispositions, some children are inherently more vulnerable to internalizing and externalizing problems than others. Second, children with adaptive self-regulation are more compliant with social norms and moral standards, which further drives them to engage in more socially approved behavior (e.g., prosocial behavior) and less socially disapproved behavior

(e.g., antisocial behavior) than their peers with poor self-regulation (Kochanska, 2002; Kochanska et al., 2000). Third, children with adaptive self-regulation are believed to be better at regulating undesirable thoughts, emotions, and behaviors and at mobilizing the desirable counterparts (Finkenauer et al., 2005). The inability to regulate undesirable cognitive, emotional, and behavioral processes as well as initiate desirable processes are major causes of psychosocial maladjustment (Zhou et al., 2009). Not surprisingly, previous research revealed that children with adaptive self-regulation skills showed fewer internalizing and externalizing problems (Eisenberg et al., 2005; 2010; Valiente et al., 2007; Zhou et al., 2009) and more empathic and prosocial behavior (Eisenberg et al., 2010; 2014; Williams & Berthelsen, 2017). As such, the link between children's self-regulation and adjustment outcomes are closely connected.

Researchers have increasingly recognized children's self-regulation as a mediating mechanism between parental factors, such as parents' psychopathology and parenting behaviors, and child adjustment (Gartstein & Fagot, 2003; Hardaway et al., 2012). Building on the literature, the present cross-sectional study further examined mindful parenting as a mediator between the parents' depressive symptoms, children's self-regulation, and adjustment outcomes. From a developmental psychopathology perspective, psychopathology involves successive processes that progress to adaptive and maladaptive outcomes (Cummings & Valentino, 2015; see also Cicchetti & Rogosch, 1996). Therefore, examining multiple pathways towards adjustment is tremendously important. Consistent with frameworks in parental depression and child development (Downey & Coyne, 1990; Goodman & Gotlib, 1999), it was hypothesized that parents' depressive symptoms would be negatively associated with mindful parenting, regardless of the parents' sex. Given that previous research suggested actor and partner effects between mothers' and fathers' depression on family interactions (e.g., Williams, 2018), it was

hypothesized that mothers' and fathers' depressive symptoms would have both actor and partner effects on mindful parenting. Mindful parenting would, in turn, be positively associated with children's self-regulation, which would be positively related to child adjustment, that is, fewer internalizing and externalizing problems, and more prosocial behavior. It was further hypothesized that mindful parenting and children's self-regulation would mediate the relation between parents' depressive symptoms and child adjustment, over and above covariates including children's age, sex, and the socioeconomic status of the families.

Methods

Participants

Participants were 332 Chinese families recruited from 5 kindergartens in Hong Kong. As 12 families reported that they were divorced, they were excluded from the study. Therefore, the final sample included 320 Chinese families involving maritally intact mothers (n = 310), fathers (n = 307), and children (n = 313; 49.01% girls) at 34.73 to 55.66 months of age (M = 46.32, SD = 3.77). Both the kindergartens and the participants were recruited through mass mailing. The median household income per month was HK$20,001-50,000 (approximately US$2,564.23–6,410.26), which was similar to the median household income of the Hong Kong population (Census and Statistics Department, 2019). A majority of mothers and fathers had completed secondary school education or above (51.49% and 48.53%, respectively). Table 1 indicates the demographic information of the present sample. The present data were missing completely at random (MCAR), as indicated by Little's MCAR test with $\chi^2(75) = 51.23$, $p = .98$.

Procedures

Families were invited to participate in the study through kindergartens. The present study was approved by ethics committee at The Education University of Hong Kong and was

conducted in accordance with the ethical standards in the 1964 Declaration of Helsinki and its later amendments. Prior to the administration of the study, written informed consent was obtained from all participating families and kindergartens. Family members who did not provide consent were excluded. Mothers and fathers each completed a questionnaire packet that included the measures described below. Trained research assistants visited each kindergarten and administered the child task. Mothers and fathers were each compensated with a HK$50 supermarket coupon (~US$6.43), whereas children were compensated with a small toy at the end of the study.

Measures

Parents' Depressive Symptoms

The 9-item Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002) was used to measure mothers' and fathers' depressive symptoms. Participants rated the frequency of the problems over the past 2 weeks on a 4-point scale from 0 (*not at all*) to 3 (*nearly every day*). Sample items included, "Little interest or pleasure in doing things" and "Feeling down, depressed, or hopeless." The item scores were averaged to form a composite score of depressive symptoms, with higher scores indicating more depressive symptoms. Based on the present data, the Cronbach's alphas of mothers' and fathers' reports were .90 and .82, respectively.

Mindful Parenting

The 15-item Bangor Mindful Parenting Scale (BMPS; Jones et al., 2014) was used to measure mothers' and fathers' mindful parenting. Participants rated on a 4-point scale from 1 (*never true*) to 4 (*always true*). Sample items included, "I stay aware of my feelings towards my child" and "When I get upset with my child I am able to keep calm." The item scores were averaged, with higher scores indicating a higher tendency of being mindful in parenting. Upon

reversed scoring, item #3 of the BMPS (i.e., “I tend to make judgements about whether I am being a good or a bad parent.”) had a negative item-to-total correlation with mindful parenting for both fathers and mothers. Therefore, the item was removed to ensure that the measure accurately reflected mindful parenting. In the present study, the Cronbach’s alphas of mothers’ and fathers’ reports were .70 and .68, respectively.

Children’s Self-Regulation

Mothers and fathers completed the 63-item Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF-P; Gioia et al., 2005) was used to assess their children’s self-regulation. Specifically, mothers and fathers rated how often the child’s behavior has been a problem in the last 6 months on a 3-point scale from 1 (*never*) to 3 (*often*). Sample items included, “[my child] does not stop laughing at funny things or events when others stop” and “[my child] is fidgety, restless, or squirmy.” The item scores were averaged, with higher scores indicating lower self-regulation. Based on the data, the Cronbach’s alphas of mothers’ and fathers’ reports were both .96.

Children’s self-regulation was also measured by the NIH Toolbox Flanker Inhibitory Control and Attention Test (Zaitchik et al., 2014). In this task, children were instructed to report the pointing direction of the target stimulus located in the center on the tablet screen and ignore the distracting stimuli located on the left or right of the target stimulus. The distracting stimuli were pointing in the same direction or reverse direction of the target stimuli in congruent or incongruent trials, respectively. Children were given four practice trials. Feedback on correctness was given by the experimenter in the practice trials to enhance children’s understanding. When children provided at least three correct responses in the practice trials, then they proceeded to the testing trials. The testing trials included a set of 20 mixed congruent and incongruent trials with

fish as stimuli and another set of 20 mixed congruent and incongruent trials with arrows as stimuli. One mark was rewarded for each correct response and the maximum score was 40. Higher scores indicated a higher level of self-regulation. In the present study, the Cronbach's alpha was .79.

Children's Internalizing and Externalizing Problems, and Prosocial Behavior

The 25-item Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) was used to measure children's internalizing problems, externalizing problems, and prosocial behavior. Mothers and fathers rated how much they agree to the descriptions of their child on a 3-point scale from 1 (*not true*) to 3 (*certainly true*). Sample items included, "[my child has] many worries, often seems worried (internalizing problems), "[my child is] restless, overactive, cannot stay still for long (externalizing problems)", and "[my child is] considerate of other people's feelings (prosocial behavior)." The item scores were averaged, with higher scores indicating more internalizing problems, externalizing problems, and prosocial behavior respectively. The Cronbach alphas of mothers' and fathers' reports were .68 and .65 for internalizing problems, .72 and .69 for externalizing problems, and .71 and .68 for prosocial behavior, respectively.

Data Analyses

Correlations, means, and standard deviations were conducted as preliminary analyses. Structural equation modeling was then conducted via MPLUS, Version 8 (Muthén & Muthén, 2017) to investigate the mediating effects of mindful parenting and children's self-regulation between parents' depressive symptoms and child adjustment, with families' socioeconomic status, children's sex, and age as covariates. To reduce potential biases, latent constructs involving children's behaviors were formed. Specifically, children's self-regulation was indicated by manifest variables involving the composite scores of the child task (i.e., NIH

Toolbox Flanker Inhibitory Control and Attention Test; Zaitchik et al., 2014), as well as mothers' report and fathers' report of the BRIEF-P (Gioia et al., 2005). Latent variables of children's internalizing problems, externalizing problems, and prosocial behavior were indicated by mothers' report and fathers' report of the SDQ (Goodman, 1997), respectively. Maximum likelihood method was used to investigate the model fit to observed matrices of variance and covariance. Full information maximum likelihood estimation was used to handle missing data. Since previous research indicated that bootstrapping yields more accurate estimates of the indirect effect standard errors compared to other approaches (Shrout & Bolger, 2002), bootstrapping was adopted to examine the mediation effects.

Results

Table 2 shows the zero-order correlations, means, and standard deviations for the variables. Specifically, children's age was associated with fathers' greater mindful parenting (r = .12, p = .05), children's better performance in self-regulation (r = .16, p < .01), mothers' report of children's lower self-dysregulation (r = -.13, p < .05), fathers' and mothers' reports of children's fewer internalizing problems (rs = -.18, p < .01), and mothers' report of greater prosocial behavior (r = .14, p < .05). Being a girl was associated with greater fathers' mindful parenting (r = .14, p < .05) and lower self-dysregulation ($r_{father\ report}$ = -.16, p < .01; $r_{mother\ report}$ = -.14, p < .05), mothers' report of fewer internalizing problems (r = -.14, p < .05), fathers' report of fewer externalizing problems (r = -.13, p < .05), and greater prosocial behavior ($r_{father\ report}$ = .13, p < .05; $r_{mother\ report}$ = .18, p < .01). Families' socioeconomic status was associated with mothers' fewer depressive symptoms (r = -.25, p < .001), mindful parenting ($r_{father\ report}$ = .17, p < .01; $r_{mother\ report}$ = .31, p < .001), children's better self-regulation ($r_{child\ performance}$ = .13, p < .05; $r_{father\ report}$ = -.13, p < .05; $r_{mother\ report}$ = -.19, p < .01), and fewer externalizing problems ($r_{father\ report}$

= -.16, $p < .01$; $r_{mother\ report}$ = -.20, $p < .01$). As children's age, sex, and families' socioeconomic status were correlated with these variables under study, they were included as control variables in the mediation analyses.

Paired-sample t-test showed that mothers reported a greater level of depressive symptoms (M = .46, SD = .54) than did fathers (M = .37, SD = .39), $t(301) = -2.68$, $p < .01$. Mothers and fathers also differed in their perceptions of children's self-regulation (M_{mother} = 1.57, SD = .30; M_{father} = 1.61, SD = .31; $t(303) = 2.33$, $p < .05$) and externalizing problems (M_{mother} = 1.68, SD = .33; M_{father} = 1.72, SD = .30; $t(303) = 2.73$, $p < .01$). However, they did not differ on their levels of mindful parenting and perceptions of children's internalizing problems and prosocial behavior, ps > .05. Table 2 further shows that mothers' and fathers' reports were generally correlated with each other.

The structural equation model fit adequately to the data, $\chi^2(116) = 249.87$, $p < .001$, CFI = .94, TLI = .91, RMSEA = .06, SRMR = .05 (see Figure 1 and Table 3 for details). In the measurement model, a latent variable of self-regulation was significantly associated with manifest variables involving the scores based on child task, mothers' report, and fathers' report, ps < .01, respectively. Similarly, latent variables of children's internalizing problems, externalizing problems, and prosocial behavior were significantly associated with manifest variables involving mothers' and fathers' reports, respectively, ps < .001. Finally, families' socioeconomic status was significantly indicated by manifest variables including household income, mothers' and fathers' education levels, and mothers' and fathers' perceived financial status.

In the structural model, fathers' depressive symptoms were related to fathers', but not mothers', mindful parenting (β = -.22, $p < .001$). Similarly, mothers' depressive symptoms were

related to mothers', but not fathers', mindful parenting (β = -.48, $p < .001$) as well as children's self-regulation (β = -.26, $p < .001$). Fathers' and mothers' mindful parenting, in turn, was related to children's self-regulation (β = .24 and .33, ps < .001, respectively). Fathers' mindful parenting was also related to children's internalizing problems (β = .11, $p < .05$). Children's self-regulation was related to internalizing problems, externalizing problems, and prosocial behavior (β = -.63, $p < .001$; β = -.69, $p < .001$; and β = .28, $p < .01$, respectively). In addition, children's age was positively related to self-regulation (β = .10, $p < .05$) and negatively related to internalizing problems (β = -.13, $p < .05$). Being a girl was associated with greater self-regulation (β = .13, $p < .01$) and prosocial behavior (β = .16, $p < .05$). Socioeconomic status was positively associated with fathers' and mothers' mindful parenting (β = .26 and .20, respectively, ps < .001), and negatively associated with children's prosocial behavior (β = -.22, $p < .01$).

Follow-up mediation findings (see Table 4) indicated that the standardized indirect effect between fathers' depressive symptoms and children's self-regulation via fathers' mindful parenting was significant (β = -.05, $p < .01$). Based on 10000 bootstrap samples with replacement, the 95% confidence interval (CI) indicated that the standardized indirect effect between fathers' depressive symptoms and children's self-regulation via fathers' mindful parenting did not include a zero [CI: (-.09, -.01)]. Therefore, fathers' mindful parenting mediated the link between fathers' depressive symptoms and children's self-regulation. Additionally, the standardized indirect effects between fathers' depressive symptoms and children's internalizing problems (β = .03, $p < .01$), externalizing problems (β = .04, $p < .01$), and prosocial behavior (β = -.02, $p < .05$) via fathers' mindful parenting and children's self-regulation were significant. Based on 10000 bootstrap samples with replacement, the 95% CI indicated that the standardized indirect effect between fathers' depressive symptoms and children's adjustment outcomes via

fathers' mindful parenting and children's self-regulation did not include zeros [$CI_{internalizing\ problems}$: (.01, .06); $CI_{externalizing\ problems}$: (.01, .06); and $CI_{prosocial\ behavior}$: (-.04, -.003)]. Therefore, fathers' mindful parenting and children's self-regulation mediated the links between fathers' depressive symptoms and children's internalizing problems, externalizing problems, and prosocial behavior.

Similarly, the standardized indirect effect between mothers' depressive symptoms and children's self-regulation via mothers' mindful parenting was significant ($\beta = -.16$, $p < .001$). Based on 10000 bootstrap samples with replacement, the 95% CI indicated that the standardized indirect effect between mothers' depressive symptoms and children's self-regulation via mothers' mindful parenting did not include a zero [CI: (-.24, -.09)]. Therefore, mothers' mindful parenting mediated the link between mothers' depressive symptoms and children's self-regulation. Additionally, the standardized indirect effects between mothers' depressive symptoms and children's internalizing problems ($\beta = .10$, $p < .001$), externalizing problems ($\beta = .11$, $p < .001$), and prosocial behavior ($\beta = -.05$, $p < .01$) via mothers' mindful parenting and children's self-regulation were significant. Based on 10000 bootstrap samples with replacement, the 95% CI indicated that the standardized indirect effect between mothers' depressive symptoms and children's adjustment outcomes via mothers' mindful parenting and children's self-regulation did not include zeros [$CI_{internalizing\ problems}$: (.05, .15); $CI_{externalizing\ problems}$: (.06, .16); and $CI_{prosocial\ behavior}$: (-.10, -.02)]. Therefore, mothers' mindful parenting and children's self-regulation mediated the links between mothers' depressive symptoms and children's internalizing problems, externalizing problems, and prosocial behavior.

Discussion

This cross-sectional study revealed pathways between parents' depressive symptoms and child adjustment. Notably, both mothers' and fathers' depressive symptoms were associated with their respective levels of mindful parenting, which was, then, related to children's self-regulation. As a protective factor, children's self-regulation was related to all three adjustment outcomes, including fewer internalizing problems, fewer externalizing problems, and more prosocial behavior, after controlling for covariates including children's age, sex, and the socioeconomic status of the families. Extending previous research in parental depression (Ramchandani et al., 2005; 2008), fathering (Lamb, 1975; Phares & Compas, 1992), and mindful parenting (Duncan et al., 2009), both parents' and children's behaviors mediated between parents' depressive symptoms and child adjustment, regardless of the sex of the parent. Consistent with the developmental psychopathology perspective (Cicchetti & Rogosch, 1996), these pathways were linked to multiple aspects of adjustment in early childhood.

Supporting previous findings (Fernandes et al., 2021; Moreira & Canavarro, 2018), parents with more severe symptoms were less likely to engage in mindful parenting, regardless of the parents' sex. More specifically, they were less likely to listen attentively to themselves and their children, be aware of and accept their experiences nonjudgmentally, develop self-regulation in parenting, and express compassion for themselves and their children. These findings substantiate previous work on depression (e.g., Beck, 1979), in that depression compromises people's attention to the present moment, nonjudgmental awareness and acceptance, and reduced automatic cognitive biases and ruminative thoughts, all of which are central in mindfulness and mindful parenting. Contrary to previous findings of actor and partner effects of parental depression on parenting (e.g., Williams, 2018), it is worth noting that fathers' and mothers' depressive symptoms were only related to their own, but not the other parents', mindful

parenting, thereby demonstrating a lack of partner effects (Kenny & Cook, 1999; see also Jocson, 2020). When a parent is mindful to begin with, their parenting practices might be less likely to be affected by the other parents' depressive symptoms. Therefore, to further understand the potential link between parents' depressive symptoms and mindful parenting between mothers and fathers, future studies should also investigate potential moderators such as dispositional mindfulness, parents' stress, and coping skills. The lack of partner effects might also be due to common reporter bias. Future investigators should rule out biases by having partner-report of parental depression and mindful parenting. Finally, these null findings might be due to the cross-sectional nature of this study. To investigate how parental depression evolves to affect the other parent, future investigators should examine actor-partner effects and their directionality via longitudinal studies.

Consistent with the literature, mothers reported a greater level of depressive symptoms than did fathers (e.g., Ponnet et al., 2013). Somewhat surprisingly, however, mothers', but not fathers', depressive symptoms were associated with children's self-regulation. Contrary to studies showing both maternal and paternal effects of depressive symptoms on child adjustment (Gartstein & Fagot, 2003; Ramchandani et al., 2005; 2008), fathers' depressive symptoms were not related to children's self-regulation when mothers' effect was taken into account. In the present sample, 91.80% of fathers were employed full-time, compared to only 46.20% of mothers. The difference in their employment status implied that mothers were likely to be spending more time with their children daily. As such, compared to fathers, mothers' depressive symptoms might be more significant in children's self-regulation. Based on this speculation, future investigators should examine why, how, and whether the relation between parents'

depressive symptoms and children's self-regulation differ as a function of parents' sex and third variables, such as quality time with children per week.

Mothers' and fathers' practice of mindful parenting was associated with children's better self-regulation. This finding is consistent with previous studies (Bögels & Restifo, 2013): when parents are less automatic and less judgmental during parent-child interactions, they are more likely to pause and be attuned to their needs and their child's needs. With better self-regulation, these parents set an example for children to practice regulatory skills (Sameroff, 2010) that foster children's better self-regulation (see also Evans et al., 2020; Zhang et al., 2019). It is, however, important to note that future longitudinal studies are needed to tease apart parent versus child effects, e.g., whether parents and children bidirectionally affect one another's self-regulation in the context of parental depression. Consistent with previous research (Wong et al., 2019), mothers' mindful parenting was also associated with children's greater prosocial behavior. Perhaps mothers who were more mindful in parenting modeled prosocial behavior for their children, such as being attuned to others and offering appropriate support or practicing kindness in helping the people in need. Contrary to the maternal effects, the link between fathers' mindful parenting and children's prosocial behavior was not significant in this study. As discussed earlier, participating mothers from this study were likely to be spending more time every day with their children than were the fathers. As such, compared to fathers, mothers' mindful parenting might be more significant in its relation to children's prosocial behavior. Surprisingly, fathers' mindful parenting was related to children's greater internalizing problems in the structural equation model. Upon closer examination of the simple correlations (see Table 2), fathers' mindful parenting was, instead, significantly related to children's *fewer* internalizing problems. The present contradictory findings might be due, in part, to multicollinearity between

fathers' mindful parenting practices and other predictors of children's internalizing problems. Of note, when children's self-regulation was removed from the structural equation model (see Supplementary Materials), fathers' mindful parenting was not related to children's internalizing problems at all. Given these inconsistent findings, future studies are needed to further replicate the link between fathers' mindful parenting and children's internalizing problems in simpler models and with a larger sample.

Supporting previous research (Eisenberg et al., 2005; 2010; Valiente et al., 2007; Williams & Berthelsen, 2017; Zhou et al., 2009), children's ability to regulate undesirable cognitive, emotional, and behavioral processes was central to their psychosocial and behavioral adjustment (Zhou et al., 2009). As a key finding, both mindful parenting and children's self-regulation were part of an indirect chain of processes between parents' depressive symptoms and child adjustment. As discussed earlier, although parental depression set in motion "unmindful" parenting, parents who were able to apply the skills of mindfulness in parenting had children with better self-regulation and positive outcomes.

Regarding the links between the demographics and the study variables, zero-order correlations and structural equation modeling converged to suggest that being a girl was related to better self-regulation. This finding was consistent with the literature indicating that girls outperformed boys in self-regulation in early childhood (Fung et al., 2019; Matthews et al., 2009). Consistent with studies showing gender differences in prosocial behavior (e.g., Hay et al., 1999), being a girl was also related to greater prosocial behavior in this study. Moreover, older children had better self-regulation and fewer internalizing problems. Indeed, as children age, they are more capable of developing self- and emotion regulation skills (Montroy et al., 2016) that foster adjustment. Next, families' socioeconomic status, as represented by education level,

family income, and perceived financial status, was positively related to mothers' and fathers' mindful parenting. With an increased socioeconomic status, parents might be more able to focus on the here and now in parenting, rather than being worried about neighborhood safety, household crowdedness, and financial stress, which may be common in Hong Kong (e.g., Cheung et al., 2018; Suen et al., 2019; Yeung et al., 2020). Surprisingly, increasing socioeconomic status was also associated with mothers' decreasing depressive symptoms. Future studies should further examine whether there exist third variables causing the negative association between socioeconomic status and depressive symptoms.

Limitations and Future Directions

The present study has numerous strengths, including the investigation of multiple family processes underlying child adjustment, the incorporation of both mothers' and fathers' behavior as predictors of child adjustment, the use of multiple assessments and reports to measure children's behavior, and the study of processes, primarily examined in Western contexts, in an East Asian context. Despite its notable strengths, the findings must be interpreted in light of several limitations. First, this study utilized self-report measures for mothers' and fathers' depressive symptoms and mindful parenting. Future research should include multiple reporters to reduce self-report biases. Similarly, to address the limitations of relying only on parent report for child adjustment, other sources such as observational data and diary data should be incorporated to assess the underlying constructs. Next, the cross-sectional design precluded us from drawing conclusions on the temporal sequence and causations between the variables under study. As such, longitudinal research with a minimum of three time points is crucial to identify the temporal sequence and directionality of mediation effects (Maxwell & Cole, 2007). Where appropriate, experimental research also is necessary to draw causal conclusions. In addition, the

Cronbach's alphas of the BMPS (Jones et al., 2014) and the SDQ (SDQ; Goodman, 1997) were below .70 for both mothers and fathers. The internal consistency was lower than what is typically regarded as acceptable and thus must be interpreted with caution. Also, in the structural equation model, the factor loadings for fathers' reports and the child task and were lower than the loadings of mothers' reports across the latent constructs. Therefore, the constructs were predominantly based on mothers' reports and must be interpreted with caution. Moreover, to increase scientific rigor, researchers may test competing hypotheses to draw additional conclusions of their findings. For example, future studies may further examine whether fathers' depressive symptoms mediated or moderated the effect of mothers' depressive symptoms on child outcomes (e.g., Fisher et al., 2015). Finally, the present study involved only Chinese families recruited from kindergartens. Future research should examine the generalizability of these findings across diverse samples, e.g., clinical samples, diverse ethnic samples, and other social minorities. Moderating variables, such as mothers' versus fathers' time spent with children per week, may also be examined to add specificity to the current findings.

Declarations

Ethics Approval

The present study was approved by ethics committee at The Education University of Hong Kong (Ref: 2018-2019-0037) and was conducted in accordance with the ethical standards in the 1964 Declaration of Helsinki and its later amendments.

Consent

Prior to the administration of the study, written informed consent was obtained from all participating families and kindergartens.

Funding

The present study was funded by Centre for Child and Family Science, The Education University of Hong Kong.

Conflict of interest

The authors declare that they have no conflict of interest.

Data, Materials and/or Code availability

The dataset analyzed in this article is not publicly available. Requests to access the dataset should be directed to rymcheung@eduhk.hk.

Author contribution statement

RYMC conceptualized the manuscript, supervised the execution of the study, performed formal analyses, and wrote the paper. WYC and JBL collaborated with the conceptualization and writing of the manuscript. CBL collaborated with the conceptualization and revision of the manuscript. KKHC collaborated with the conceptualization of the manuscript, acquired funding and resources of the study, and revised the manuscript.

References

Anālayo, B. (2021). The Buddha and his son. *Mindfulness, 12*(2), 269–274. https://doi.org/10.1007/s12671-020-01394-7

Beck, A. T. (1979). *Cognitive therapy of depression.* Guilford Press.

Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55*(1), 83–96. https://doi.org/10.2307/1129836

Bögels, S. M., Lehtonen, A., & Restifo, K. (2010). Mindful parenting in mental health care. *Mindfulness, 1*(2), 107–120. https://doi.org/10.1007/s12671-010-0014-5

Bögels, S., & Restifo, K. (2013). *Mindful parenting: A guide for mental health practitioners.* Springer. https://doi.org/10.1007/s12671-013-0256-0

Campbell, S. B., & Ewing, L. J. (1990). Follow-up of hard-to-manage preschoolers: Adjustment at age 9 and predictors of continuing symptoms. *Journal of Child Psychology and Psychiatry, 31*(6), 871–889. https://doi.org/10.1111/j.1469-7610.1990.tb00831.x

Census and Statistics Department. (2019). *Hong Kong annual digest of statistics–2019 edition*. Census and Statistics Department, Hong Kong Special Administrative Region. https://www.statistics.gov.hk/pub/B10100032019AN19B0100.pdf

Cents, R. A. M., Diamantopoulou, S., Hudziak, J. J., Jaddoe, V. W.V, Hofman, A., Verhulst, F. C., Lambregtse-van den Berg, M. P., & Tiemeier, H. (2013). Trajectories of maternal depressive symptoms predict child problem behaviour: The Generation R Study. *Psychological Medicine, 43*, 13–25. https://doi.org/10.1017/S0033291712000657

Cheung, R. Y. M., Leung, M. C., Chung, K. K. H., & Cheung, H. Y. (2018). Family risks and adolescent adjustment in Chinese contexts: testing the mediating role of emotional

intelligence. *Journal of Child and Family Studies, 27*(12), 3887-3896. https://doi.org/10.1007/s10826-018-1233-y

Cheung, R. Y. M., Leung, S. S., & Mak, W. W. (2019). Role of Mindful parenting, affiliate stigma, and parents' well-being in the behavioral adjustment of children with Autism Spectrum Disorder: Testing parenting stress as a mediator. *Mindfulness, 10*(11), 2352–2362. https://doi.org/10.1007/s12671-019-01208-5

Cheung, R. Y. M., & Ng, M. C. Y (2019). Mindfulness and symptoms of depression and anxiety: The underlying roles of awareness, acceptance, impulse control, and emotion regulation. *Mindfulness, 10*(6), 1124–1135. https://doi.org/10.1007/s12671-018-1069-y

Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology, 8*(4), 597–600. https://doi.org/10.1017/s0954579400007318

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology, 48*(1), 243–267. https://doi.org/10.1146/annurev.psych.48.1.243

Coyne, L. W., & Thompson, A. D. (2011). Maternal depression, locus of control, and emotion regulatory strategy as predictors of preschoolers' internalizing problems. *Journal of Child and Family Studies, 20*(6), 873–883. https://doi.org/10.1007/s10826-011-9455-2

Cummings, E. M., Cheung, R. Y. M., & Davies, P. T. (2013). Prospective relations between parental depression, negative expressiveness, emotional insecurity, and children's internalizing symptoms. *Child Psychiatry & Human Development, 44*(6), 698–708. https://doi.org/10.1007/s10578-013-0362-1

Cummings, E. M., Cheung, R. Y. M., Koss, K., & Davies, P. T. (2014). Parental depressive symptoms and adolescent adjustment: A prospective test of an explanatory model for the

role of marital conflict. *Journal of Abnormal Child Psychology*, *42*(7), 1153–1166. https://doi.org/10.1007/s10802-014-9860-2

Cummings, E. M., & Valentino, K. (2015). Developmental psychopathology. In W. F., Overton, P. C. M., Molenaar, & R. M. Lerner (Eds.), *Handbook of child psychology and developmental science: Theory and method* (pp. 566–606). John Wiley & Sons, Inc.

Davé, S., Sherr, L., Senior, R., & Nazareth, I. (2008). Associations between paternal depression and behaviour problems in children of 4-6 years. *European Child and Adolescent Psychiatry*, *17*(5), 306–315. https://doi.org/10.1007/s00787-007-0672-6

Dix, T., & Meunier, L. N. (2009). Depressive symptoms and parenting competence: An analysis of 13 regulatory processes. *Developmental Review*, *29*(1), 45–68. https://doi.org/10.1016/j.dr.2008.11.002

Downey, G., & Coyne, J. C. (1990). Children of depressed parents: An integrative review. *Psychological Bulletin*, *108*(1), 50–76. https://doi.org/10.1037/0033-2909.108.1.50

Dunbar, J. P., McKee, L., Rakow, A., Watson, K. H., Forehand, R., & Compas, B. E. (2013). Coping, negative cognitive style and depressive symptoms in children of depressed parents. *Cognitive Therapy and Research*, *37*(1), 18–28. https://doi.org/10.1007/s10608-012-9437-8

Duncan, L. G., Coatsworth, J. D., & Greenberg, M. T. (2009). A model of mindful parenting: Implications for parent-child relationships and prevention research. *Clinical Child and Family Psychology Review*, *12*(3), 255–270. https://doi.org/10.1007/s10567-009-0046-3

Eisenberg, N., Sadovsky, A., Spinrad, T. L., Fabes, R. A., Losoya, S. H., Valiente, C., Reiser, M., Cumberland, A., & Shepard, S. A. (2005). The relations of problem behavior status to children's negative emotionality, effortful control, and impulsivity: Concurrent relations

and prediction of change. *Developmental Psychology, 41*(1), 193–211. https://doi.org/10.1037/0012-1649.41.1.193

Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual Review of Clinical Psychology, 6*(1), 495–525. https://doi.org/10.1146/annurev.clinpsy.121208.131208

Eisenberg, N., Spinrad, T. L., & Morris, A. (2014). *Empathy-related responding in children.* In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 184–207). Psychology Press. https://doi.org/10.4324/9780203581957.ch9

Evans, S., Bhide, S., Quek, J., Nicholson, J. M., Anderson, V., Hazell, P., Mulraney, M., & Sciberras, E. (2020). Mindful parenting behaviors and emotional self-regulation in children with ADHD and controls. *Journal of Pediatric Psychology, 45*(9), 1074–1083. https://doi.org/10.1093/jpepsy/jsaa073

Fanti, K. A., & Henrich, C. C. (2010). Trajectories of pure and co-occurring internalizing and externalizing problems from age 2 to age 12: findings from the National Institute of Child Health and Human Development Study of Early Child Care. *Developmental Psychology, 46*(5), 1159-1175. https://doi.org/10.1037/a0020659

Fernandes, D.V, Canavarro, M. C., & Moreira, H. (2021). The mediating role of parenting stress in the relationship between anxious and depressive symptomatology, mothers' perception of infant temperament, and mindful parenting during the postpartum period. *Mindfulness, 12*(2), 275–290. https://doi.org/10.1007/s12671-020-01327-4

Finkenauer, C., Engels, R., & Baumeister, R. (2005). Parenting behaviour and adolescent behavioural and emotional problems: The role of self-control. *International Journal of Behavioral Development, 29*(1), 58–69. https://doi.org/10.1080/01650250444000333

Fisher, S. D., Brock, R. L., O'Hara, M. W., Kopelman, R., & Stuart, S. (2015). Longitudinal contribution of maternal and paternal depression to toddler behaviors: Interparental conflict and later depression as mediators. *Couple and Family Psychology: Research and Practice*, *4*(2), 61–73. https://doi.org/10.1037/cfp0000037

Fung, W. K., Chung, K. K. H., & Cheng, R. W. Y. (2019). Gender differences in social mastery motivation and its relationships to vocabulary knowledge, behavioral self-regulation, and socioemotional skills. *Early Education and Development*, *30*(2), 280–293. https://doi.org/10.1080/10409289.2018.1544004

Gartstein, M. A., & Fagot, B. I. (2003). Parental depression, parenting and family adjustment, and child effortful control: Explaining externalizing behaviors for preschool children. *Journal of Applied Developmental Psychology*, *24*(2), 143–177. https://doi.org/10.1016/s0193-3973(03)00043-1

Gioia, G. A., Isquith, P. K., Guy, S. C., & Kenworthy, L. (2000). *Behavior rating inventory of executive function: BRIEF*. Psychological Assessment Resources.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, *38*(5), 581–586. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review*, *106*(3), 458–490. https://doi.org/10.1037/0033-295x.106.3.458

Han, Z. R., Ahemaitijiang, N., Yan, J., Hu, X., Parent, J., Dale, C., DiMarzio, K., & Singh, N. N. (2021). Parent mindfulness, parenting, and child psychopathology in China. *Mindfulness*, *12*(2), 334–343. https://doi.org/10.1007/s12671-019-01111-z

Hardaway, C. R., Wilson, M. N., Shaw, D. S., & Dishion, T. J. (2012). Family functioning and externalizing behaviour among low-income children: Self-regulation as a mediator. *Infant and Child Development*, *21*(1), 67–84. https://doi.org/10.1002/icd.765

Hay, D. F., Castle, J., Davies, L., Demetriou, H., & Stimson, C. A. (1999). Prosocial action in very early childhood. *Journal of Child Psychology and Psychiatry*, *40*(6), 905–916. https://doi.org/10.1111/1469-7610.00508

Henrichs, J., van den Heuvel, M.I., Witteveen, A.B., Wilschut, J., & Van den Bergh, B. R. H. (2021). Does mindful parenting mediate the association between maternal anxiety during pregnancy and child behavioral/emotional problems? *Mindfulness*, *12*(2), 370–380. https://doi.org/10.1007/s12671-019-01115-9

Jocson, R. M. (2020). A dyadic analysis of depressive symptoms, harsh parenting, and rejection in Filipino mothers and fathers. *Family Process.* https://doi.org/10.1111/famp.12547

Jones, L., Hastings, R. P., Totsika, V., Keane, L., & Rhule, N. (2014). Child behavior problems and parental well-being in families of children with autism: The mediating role of mindfulness and acceptance. *American Journal on Intellectual and Developmental Disabilities*, *119*(2), 171–185. https://doi.org/10.1352/1944-7558-119.2.171

Joormann, J., Dkane, M., & Gotlib, I. H. (2006). Adaptive and maladaptive components of rumination? Diagnostic specificity and relation to depressive biases. *Behavior Therapy*, *37*(3), 269–280. https://doi.org/10.1016/j.beth.2006.01.002

Kane, P., & Garber, J. (2004). The relations among depression in fathers, children's psychopathology, and father-child conflict: A meta-analysis. *Clinical Psychology Review*, *24*(3), 339–360. https://doi.org/10.1016/j.cpr.2004.03.004

Kenny, D. A., & Cook, W. L. (1999). Partner effects in relationship research: Conceptual issues, analytic difficulties, and illustrations. *Personal Relationships, 6,* 433–448. https://doi.org/10.1111/j.1475-6811.1999.tb00202.x

Kochanska, G. (2002). Committed compliance, moral self, and internalization: A mediational model. *Developmental Psychology*, *38*(3), 339–351. https://doi.org/10.1037/0012-1649.38.3.339

Kochanska, G., Murray, K. T., & Harlan, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology*, *36*(2), 220–232. https://doi.org/10.1037/0012-1649.36.2.220

Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals, 32*(9), 509–515. https://doi.org/10.3928/0048-5713-20020901-06

Lamb, M. E. (1975). Fathers: Forgotten contributors to child development. *Human Development, 18*(4), 245–266. https://doi.org/10.1159/000271493

Letourneau, N., Leung, B., Ntanda, H., Dewey, D., Deane, A. J., & Giesbrecht, G. F. (2019). Maternal and paternal perinatal depressive symptoms associate with 2-and 3-year-old children's behaviour: Findings from the APrON longitudinal study. *BMC Pediatrics, 19*(1), 1–13. https://doi.org/10.1186/s12887-019-1775-1

Lo, H. H. M., Yeung, J. W. K., Duncan, L. G., Ma, Y., Siu, A. F. Y., Chan, S. K. C., Choi, C. W., Szeto, M. P., Chow, K. K. W., & Ng, S. M. (2018). Validating of the interpersonal mindfulness in parenting scale in Hong Kong Chinese. *Mindfulness*, *9*(5), 1390–1401. https://doi.org/10.1007/s12671-017-0879-7

Matthews, J. S., Ponitz, C. C., & Morrison, F. J. (2009). Early gender differences in self-regulation and academic achievement. *Journal of Educational Psychology, 101*(3), 689–704. https://doi.org/10.1037/a0014240

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*(1), 23–44. https://doi.org/10.1037/1082-989x.12.1.23

Montroy, J. J., Bowles, R. P., Skibbe, L. E., McClelland, M. M., & Morrison, F. J. (2016). The development of self-regulation across early childhood. *Developmental Psychology, 52*(11), 1744–1762. https://doi.org/10.1037/dev0000159

Moreira, H., & Canavarro, M. C. (2018). Does the association between mindful parenting and adolescents' dispositional mindfulness depend on the levels of anxiety and depression symptomatology in mothers? *Journal of Adolescence, 68*, 22–31. https://doi.org/10.1016/j.adolescence.2018.07.003

Moreira, H., Fonseca, A., Caiado, B., & Canavarro, M. C. (2019). Work-family conflict and mindful parenting: The mediating role of parental psychopathology symptoms and parenting stress in a sample of Portuguese employed parents. *Frontiers in Psychology, 10*, 635. https://doi.org/10.3389/fpsyg.2019.00635

Moreira, H., Gouveia, M. J., & Canavarro, M. C. (2018). Is mindful parenting associated with adolescents' well-being in early and middle/late adolescence? The mediating role of adolescents' attachment representations, self-compassion and mindfulness. *Journal of Youth and Adolescence, 47*(8), 1771–1788. https://doi.org/10.1007/s10964-018-0808-7

Muthén, L. K., & Muthén, B. O. (2017). *MPLUS: Statistical analysis with latent variables: User's guide (Version 8).* Muthén & Muthén.

Otto, Y., Kolmorgen, K., Sierau, S., Weis, S., von Klitzing, K., & Klein, A. M. (2016). Parenting behaviors of mothers and fathers of preschool age children with internalizing disorders. *Journal of Child and Family Studies, 25*(2), 381–395. https://doi.org/10.1007/s10826-015-0242-3

Parent, J., DiMarzio, K. (2021). Advancing mindful parenting research: An introduction. *Mindfulness, 12*(2), 261–265. https://doi.org/10.1007/s12671-020-01572-7

Parent, J., Garai, E., Forehand, R., Roland, E., Potts, J., Haker, K., Champion, J. E., & Compas, B. E. (2010). Parent mindfulness and child outcome: The roles of parent depressive symptoms and parenting. *Mindfulness, 1*(4), 254–264. https://doi.org/10.1007/s12671-010-0034-1

Parent, J., McKee, L. G., N. Rough, J., & Forehand, R. (2016). The association of parent mindfulness with parenting and youth psychopathology across three developmental stages. *Journal of Abnormal Child Psychology, 44*(1), 191–202. https://doi.org/10.1007/s10802-015-9978-x

Phares, V., & Compas, B. E. (1992). The role of fathers in child and adolescent psychopathology: Make room for daddy. *Psychological Bulletin, 111*(3), 387–412. https://doi.org/10.1037/0033-2909.111.3.387

Pietikäinen, J. T., Kiviruusu, O., Kylliäinen, A., Pölkki, P., Saarenpää-Heikkilä, O., Paunio, T., & Paavonen, E. J. (2020). Maternal and paternal depressive symptoms and children's emotional problems at the age of 2 and 5 years: A longitudinal study. *Journal of Child Psychology and Psychiatry, 61*(2), 195–204. https://doi.org/10.1111/jcpp.13126

Posner, M. I., & Rothbart, M. K. (2000). Developing mechanisms of self-regulation. *Development and Psychopathology, 12*(3), 427–441. https://doi.org/10.1017/S0954579400003096

Ponnet, K., Wouters, E., Mortelmans, D., Pasteels, I., De Backer, C., Van Leeuwen, K., & Van Hiel, A. (2013). The influence of mothers' and fathers' parenting stress and depressive symptoms on own and partner's parent-child communication. *Family Process, 52*(2), 312-–324. https://doi.org/10.1111/famp.12001

Ramchandani, P. G., Stein, A., O'Connor, T. G., Heron, J., Murray, L., & Evans, J. (2008). Depression in men in the postnatal period and later child psychopathology: A population cohort study. *Journal of the American Academy of Child and Adolescent Psychiatry, 47*(4), 390–398. https://doi.org/10.1097/CHI.0b013e31816429c2

Ramchandani, P., Stein, A., Evans, J., & O'connor, T. G. (2005). Paternal depression in the postnatal period and child development: A prospective population study. *The Lancet, 365*(9478), 2201–2205. https://doi.org/10.1016/s0140-6736(05)66778-5

Ren, Y., Han, Z. R., Ahemaitijiang, N., & Zhang, G. (2021). Maternal mindfulness and school-age children's emotion regulation: Mediation by positive parenting practices and moderation by maternal perceived life stress. *Mindfulness.* Advance of Print.

Rothbart, M. K., Sheese, B. E., Rueda, M. R., & Posner, M. I. (2011). Developing mechanisms of self-regulation in early life. *Emotion Review, 3*(2), 207–213. https://doi.org/10.1177/1754073910387943

Rothbarts, M. K., & Bates, J. E (2006). Temperament. In W. Damon, R. M. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology* (6th ed., pp. 99–166). Wiley.

Sameroff, A. (2010). A unified theory of development: A dialectic integration of nature and nurture. *Child Development*, *81*(1), 6–22. https://doi.org/10.1111/j.1467-8624.2009.01378.x

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, *7*(4), 422–445. https://doi.org/10.1037/1082-989x.7.4.422

Suen, Y. N., Cerin, E., Barnett, A., Huang, W. Y., & Mellecker, R. R. (2019). Associations of socio-demographic, family, and neighborhood factors with physical activity-related parenting practices among Hong Kong Preschoolers' parents. *Maternal and Child Health Journal*, *23*(5), 678–691. https://doi.org/10.1007/s10995-018-2689-5

Valiente, C., Lemery-Chalfant, K., & Reiser, M. (2007). Pathways to problem behaviors: Chaotic homes, parent and child effortful control, and parenting. *Social Development*, *16*(2), 249–267. https://10.1111/j.1467-9507.2007.00383.x

Wang, Y., Liang, Y., Fan, L., Lin, K., Xie, X., Pan, J., & Zhou, H. (2018). The indirect path from mindful parenting to emotional problems in adolescents: The role of maternal warmth and adolescents' mindfulness. *Frontiers in Psychology*, *9*, 546. https://doi.org/10.3389/fpsyg.2018.00546

Weissman, M. M., Warner, V., Wickramaratne, P., Moreau, D., & Olfson, M. (1997). Offspring of depressed parents: 10 years later. *Archives of General Psychiatry*, *54*(10), 932–940. https://doi.org/10.1001/archpsyc.1997.01830220054009

Williams, D. T. (2018). Parental depression and cooperative coparenting: A longitudinal and dyadic approach. *Family Relations, 67*(2), 253-269. https://doi.org/10.1111/fare.12308

Williams, K. E., & Berthelsen, D. (2017). The development of prosocial behaviour in early childhood: Contributions of early parenting and self-regulation. *International Journal of Early Childhood*, *49*(1), 73–94. https://doi.org/10.1007/s13158-017-0185-5

Wong, K., Hicks, L. M., Seuntjens, T. G., Trentacosta, C. J., Hendriksen, T. H., Zeelenberg, M., & van den Heuvel, M. I. (2019). The role of mindful parenting in individual and social decision-making in children. *Frontiers in Psychology*, *10*, 550. https://doi.org/10.3389/fpsyg.2019.00550

Yeung, N. C. Y., Huang, B., Lau, C. Y. K., & Lau, J. T. F. (2020). Feeling Anxious amid the COVID-19 Pandemic: Psychosocial Correlates of Anxiety Symptoms among Filipina Domestic Helpers in Hong Kong. *International Journal of Environmental Research and Public Health, 17*(21), 8102. https://doi.org/10.3390/ijerph17218102

Zaitchik, D. Iqbal, Y., & Carey, S. (2014). The effect of executive function on biological reasoning in young children: An individual differences study. *Child Development, 85*(1), 160–175. http://doi.org/10.1111/cdev.12145

Zhang, W., Wang, M., & Ying, L. (2019). Parental mindfulness and preschool children's emotion regulation: The role of mindful parenting and secure parent-child attachment. *Mindfulness*, *10*(12), 2481–2491. https://doi.org/10.1007/s12671-019-01120-y

Zhou, Q., Lengua, L. J., & Wang, Y. (2009). The relations of temperament reactivity and effortful control children's adjustment problems in China and the United States. *Developmental Psychology, 45*(3), 724–739. https://doi.org/10.1037/a0013776

Table 1

Demographic Information of the Final Sample (N = 320)

Variable	*M* (*SD*) / %
Children's age at Time 1 (month)	46.32 (3.77)
Percentage of girls	49.01%
Fathers' education level	
1. Secondary school or below	48.51%
2. Diploma / Higher diploma	12.63%
3. Bachelor's degree	29.57%
4. Postgraduate degree or above	9.30%
Mothers' education level	
1. Secondary school or below	51.47%
2. Diploma / Higher diploma	16.40%
3. Bachelor's degree	27.21%
4. Postgraduate degree or above	4.92%
Family monthly income	
1. < HK$10,000 (< US$1282)	2.73%
2. HK$10,001–15,000 (US$1,282–1,923)	6.48%
3. HK$15,001–20,000 (US$1,923–2,564)	12.29%
4. HK$20,001–50,000 (US$2,564–6,410)	39.24%
5. HK$50,001–80,000 (US$6,410–10,256)	16.03%
6. HK$80,001–100,000 (US$10,256–12,820)	9.22%
7. > HK$100,000 (> US$12,820)	13.99%
Fathers' perceived financial status	
1. Very poor	4.68%
2. Poor	6.02%
3. Lower than average	19.06%
4. Average	46.15%
5. Higher than average	22.07%
6. Rich	2.01%
Mothers' perceived financial status	
1. Very poor	3.96%
2. Poor	4.62%
3. Lower than average	15.51%
4. Average	53.47%
5. Higher than average	19.80%
6. Rich	2.64%

Table 2

Means, Standard Deviations, and Correlations Among all Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Children's age at Time 1 (month)	—															
(2) Children's sex (0 = boy; 1 = girl)	.04	—														
(3) Families' socioeconomic status	.04	-.05	—													
(4) Fathers' depressive symptoms	-.02	-.02	-.03	—												
(5) Mothers' depressive symptoms	-.06	.01	-.25***	.22***	—											
(6) Fathers' mindful parenting	.12*	.14*	.17**	-.21***	-.06	—										
(7) Mothers' mindful parenting	.05	.03	.31***	-.10	-.50***	.20**	—									
(8) Children's self-regulation performance (Child task)	.16**	.00	.13**	-.02	-.03	.03	.05	—								
(9) Fathers' report of children's self-dysregulation	-.11	-.16**	-.13*	.32***	.24***	-.39***	-.28***	-.18**	—							
(10) Mothers' report of children's self-dysregulation	-.13*	-.14*	-.19**	.16**	.44***	-.25***	-.47***	-.16**	.55***	—						
(11) Fathers' report of children's internalizing problems	-.18**	-.11	.01	.27***	.19**	-.24***	-.16**	-.17**	.61***	.36***	—					
(12) Mothers' report of children's internalizing problems	-.18**	-.14*	-.10	.15**	.36***	-.11	-.42***	-.17**	.37***	.60***	.50***	—				
(13) Fathers' report of children's externalizing problems	-.03	-.13*	-.16**	.21***	.25***	-.23***	-.25***	-.11	.58***	.41***	.35***	.19**	—			
(14) Mothers' report of children's externalizing problems	-.09	-.11	-.20**	.08	.37***	-.12*	-.37***	-.10	.35***	.63***	.17**	.37***	.59***	—		
(15) Fathers' report of children's prosocial behavior	.03	.13*	-.03	-.12*	-.10	.21***	.16**	.15*	-.37***	-.23***	-.38***	-.26***	-.39***	-.20***	—	
(16) Mothers' report of children's prosocial behavior	.14*	.18**	-.10	-.05	-.22***	.03	.24***	.08	-.21***	-.33***	-.26***	-.43***	-.22***	-.31***	.45***	—
M	46.32	—	.00	.37	.46	2.79	2.79	17.70	1.61	1.57	1.47	1.46	1.72	1.68	2.36	2.37
SD	3.77	—	1.00	.39	.54	.31	.32	10.40	.31	.30	.27	.29	.30	.32	.37	.39

Note. $^{*}p < .05$, $^{*}p < .01$, $^{***}p < .001$.

Table 3
Parameter Estimates of the Model under Study

Parameter	Unstandardized *B* (*SE*)	Standardized β
Measurement Model		
Children's self-regulation		
→ Child task on self-regulation	1.00[f]	.18[**]
→ Fathers' report of self-dysregulation	-.15 (.05)	-.59[***]
→ Mothers' report of self-dysregulation	-.10 (.04)	-.93[***]
Children's internalizing problems		
→ Fathers' report	1.00[f]	.55[***]
→ Mothers' report	1.80 (.22)	.93[***]
Children's externalizing problems		
→ Fathers' report	1.00[f]	.62[***]
→ Mothers' report	1.65 (.18)	.97[***]
Children's prosocial behavior		
→ Fathers' report	1.00[f]	.52[***]
→ Mothers' report	1.69 (.29)	.85[***]
Families' socioeconomic status		
→ Household income	1.00[f]	.91[***]
→ Mothers' education level	.23 (.02)	.72[***]
→ Fathers' education level	.23 (.02)	.68[***]
→ Mothers' perceived financial status	.52 (.03)	.77[***]
→ Fathers' perceived financial status	.55 (.04)	.78[***]
Structural Model		
Fathers' depressive symptoms		
→ Fathers' mindful parenting	-.18 (.05)	-.22[***]
→ Mothers' mindful parenting	.01 (.03)	.01
→ Children's self-regulation	-.26 (.26)	-.06
→ Children's internalizing problems	.02 (.02)	.05
→ Children's externalizing problems	-.02 (.02)	-.05
→ Children's prosocial behavior	.02 (.03)	.03
Mothers' depressive symptoms		
→ Fathers' mindful parenting	.00 (.04)	.00
→ Mothers' mindful parenting	-.29 (.03)	-.48[***]
→ Children's self-regulation	-.89 (.36)	-.26[***]
→ Children's internalizing problems	.01 (.02)	.04
→ Children's externalizing problems	.03 (.02)	.08
→ Children's prosocial behavior	-.02 (.03)	-.05
Fathers' mindful parenting		
→ Children's self-regulation	1.31 (.54)	.24[***]
→ Children's internalizing problems	.05 (.03)	.11[*]
→ Children's externalizing problems	.05 (.03)	.09
→ Children's prosocial behavior	.00 (.04)	.00
Mothers' mindful parenting		
→ Children's self-regulation	1.88 (.71)	.33[***]
→ Children's internalizing problems	-.05 (.03)	-.10
→ Children's externalizing problems	-.00 (.04)	.00
→ Children's prosocial behavior	.13 (.05)	.21[**]
Children's self-regulation		
→ Children's internalizing problems	-.05 (.02)	-.63[***]

Parameter	Unstandardized *B* (*SE*)	Standardized β
→ Children's externalizing problems	-.07 (.03)	-.69***
→ Children's prosocial behavior	.03 (.02)	.28**
Families' socioeconomic status		
→ Fathers' mindful parenting	.03 (.01)	.26***
→ Mothers' mindful parenting	.02 (.01)	.20***
→ Children's self-regulation	-.01 (.03)	-.02
→ Children's internalizing problems	.00 (.00)	.03
→ Children's externalizing problems	-.00 (.00)	-.03
→ Children's prosocial behavior	-.01 (.01)	-.22**
Children's age		
→ Fathers' mindful parenting	.00 (.00)	.03
→ Mothers' mindful parenting	.00 (.00)	.01
→ Children's self-regulation	.05 (.03)	.10*
→ Children's internalizing problems	-.01 (.00)	-.13*
→ Children's externalizing problems	.00 (.00)	.02
→ Children's prosocial behavior	.01 (.00)	.11
Children's sex (0 = boy; 1 = girl)		
→ Fathers' mindful parenting	.04 (.04)	.06
→ Mothers' mindful parenting	.02 (.03)	.02
→ Children's self-regulation	.48 (.24)	.13**
→ Children's internalizing problems	-.02 (.01)	-.05
→ Children's externalizing problems	-.01 (.02)	-.02
→ Children's prosocial behavior	.06 (.03)	.16*
Covariates		
Fathers' depressive symptoms		
←→ Mothers' depressive symptoms	.05 (.01)	.22***
←→ Family's socioeconomic status	.04 (.07)	.03
←→ Children's age	.03 (.09)	.02
←→ Children's sex (0 = boy; 1 = girl)	-.00 (.01)	-.02
Mothers' depressive symptoms		
←→ Family's socioeconomic status	-.25 (.10)	-.15*
←→ Children's age	-.11 (.12)	-.05
←→ Children's sex (0 = boy; 1 = girl)	.00 (.02)	.01
Error Covariances		
Children's internalizing problems		
←→ Children's externalizing problems	-.004 (.001)	-.29**
←→ Children's prosocial behavior	-.006 (.002)	-.37***
Children's externalizing problems		
←→ Children's prosocial behavior	-.004 (.002)	-.16*

Note. [f] Parameter is fixed to 1.00. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Table 4
Standardized Parameter Estimates and Bootstrap Analyses of Specific Indirect Effects

Independent variable	Mediator variable	Dependent variable	Standardized indirect effect (β)	95% CI indirect effect (lower, upper)
Fathers' depressive symptoms	Fathers' mindful parenting	Children's self-regulation	-.05**	-.09, -.01
	Mothers' mindful parenting	Children's self-regulation	.00	-.03, .04
	Fathers' mindful parenting and children's self-regulation	Children's internalizing problems	.03**	.01, .06
		Children's externalizing problems	.04**	.01, .06
		Children's prosocial behavior	-.02*	-.04, -.003
	Mothers' mindful parenting and children's self-regulation	Children's internalizing problems	-.00	-.02, .02
		Children's externalizing problems	-.00	-.02, .02
		Children's prosocial behavior	.00	-.01, .01
Mothers' depressive symptoms	Fathers' mindful parenting	Children's self-regulation	.00	-.02, .04
	Mothers' mindful parenting	Children's self-regulation	-.16***	-.24, -.09
	Fathers' mindful parenting and children's self-regulation	Children's internalizing problems	-.00	-.02, .01
		Children's externalizing problems	-.00	-.02, .01
		Children's prosocial behavior	.00	-.01, .01
	Mothers' mindful parenting and children's self-regulation	Children's internalizing problems	.10***	.05, .15
		Children's externalizing problems	.11***	.06, .16
		Children's prosocial behavior	-.05**	-.10, -.02

Note. $^{*}p < .05$, $^{*}p < .01$, $^{***}p < .001$.

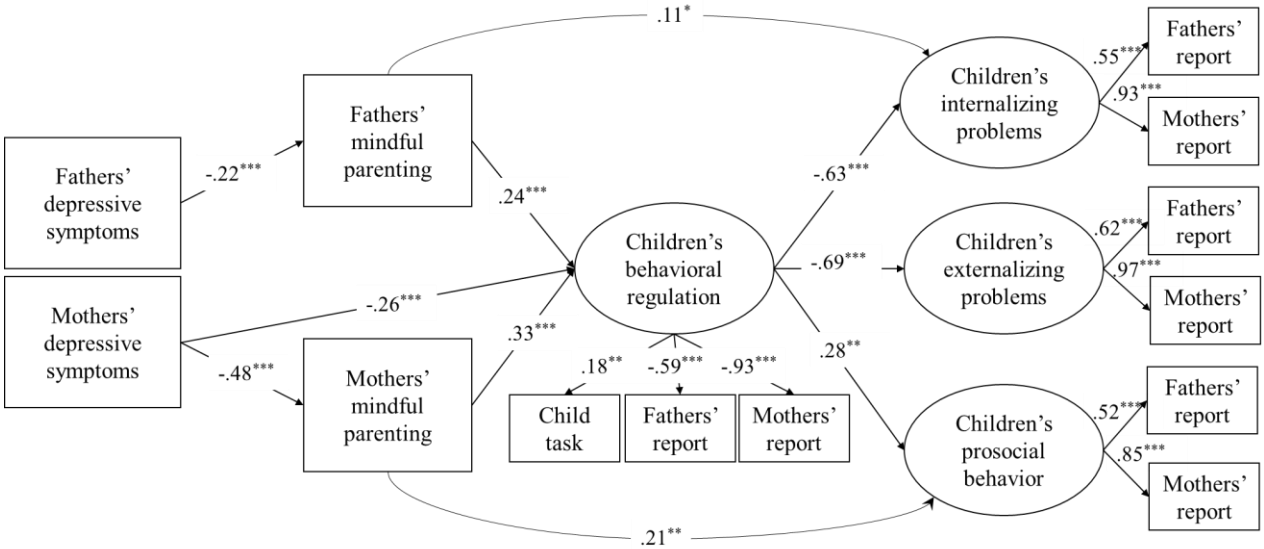

Fig. 1 Final model of mindful parenting and children's self-regulation as mediators between parents' depressive symptoms and child adjustment. $\chi^2(116) = 249.87$, $p < .001$, CFI = .94, TLI = .91, RMSEA = .06, SRMR = .05. Covariates including children's age, gender, and family's socioeconomic status were included but are not depicted in the figure for clarity. Non-significant paths are not depicted in the figure for clarity. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.