Linking maternal involvement in child online learning to child adjustment during the COVID-19 pandemic: The moderating role of maternal mindfulness

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Abstract
In the face of COVID-19, many schools have to educate their students using online activities. During this time, whether and how parents are involved may be of particular importance for young children—who are less able to learn independently via the Internet due to their developmental immaturity. Therefore, this study examined the cross-sectional association of maternal involvement in child online learning with child adjustment during the COVID-19 pandemic and tested maternal mindfulness as a moderator. Data were collected from 236 mothers of kindergarten-aged children (mean age = 55.91 months; 75% of them were girls) during the fourth wave of COVID-19 outbreak in Hong Kong, China. Using paper-and-pencil questionnaires, mothers rated their involvement and mindfulness and their children’s pre-academic ability and internalizing and externalizing behaviors and provide demographic information. Regression models revealed that maternal involvement was associated positively with child pre-academic ability and negatively with child internalizing behaviors, but such associations were only significant for children with more mindful mothers. Maternal mindfulness did not moderate the negative association between maternal involvement and child externalizing behaviors. Findings highlighted the role of maternal mindfulness in child adjustment during the COVID-19 pandemic.
development, suggesting that it may be crucial to promote maternal involvement and mindfulness during the pandemic and perhaps beyond.

**Keywords**
Child adjustment, COVID-19, mindfulness, online learning, parenting, psychology

In the face of COVID-19, many schools have to use online learning activities to promote the development of children. However—due to their developmental immaturity—young children may not be able to gain much via the Internet, especially on their own (Radesky et al., 2015). Therefore, parents are encouraged to participate in online learning activities together with their young children. From an ecological perspective, depending on the nature and the social contexts (in what activities and with whom children are involved), daily activities may help children acquire skills and competencies (Lam & McHale, 2015). Parental involvement in child online learning may be conducive to child development as it engages children in educational activities and parent–child interactions, both of which predict children’s well-being (Castro et al., 2015). Unfortunately, many parents—especially mothers who need to balance work and family responsibilities—have been struggling with and doubtful about this additional parenting load (Lawrence & Fakuade, 2021; Novianti & Garzia, 2020). Moreover, although parents’ attitudes toward child online learning during the pandemic have been examined (Dong et al., 2020; Lau & Lee, 2020), no study has tested the association of parent–child involvement in online learning with child adjustment. Therefore, using cross-sectional questionnaire data, the first goal of this study was to test if mothers’ involvement in their kindergarten-aged children’s online learning was linked with their children’s pre-academic ability and internalizing and externalizing behaviors during the suspension of face-to-face classes.

A model of mindful parenting highlights the importance of parents being mindful when interacting with their children (Duncan et al., 2009). Mindfulness involves attending to the present moment, navigating the experience with curiosity, acceptance, and compassion (Feldman et al., 2007). When parents are mindful during parent–child interactions, they communicate with their children with full attention, building genuine connections with and cultivating emotional awareness in their children. Indeed, studies have indicated that mindful parenting may contribute to children’s well-being (Duncan et al., 2009). Little is known, however, about the potential moderating role of parental mindfulness in understanding the implications of parental involvement in child online learning. As young children may depend on their parents to link virtual information to social reality (Radesky et al., 2015), more mindful parents may bring more benefits to their children through joint involvement in online learning activities. Therefore, the second goal of this study was to test if maternal mindfulness moderated the link between maternal involvement in child online learning and child adjustment.

Based on theory and research, we hypothesized that mothers’ involvement would be associated with higher pre-academic ability and lower internalizing and externalizing behaviors in their children, especially for children with more mindful mothers. To isolate
the impact of maternal involvement (Radesky et al., 2015), we controlled for child gender and age, maternal age and use of technology to occupy the child, and maternal education—a proxy of family socioeconomic status (SES).

**Methods**

**Participants and procedures**

Participants were 236 Chinese mothers whose children studied in four kindergartens in Hong Kong, China. To recruit families of diverse SES, we first stratified the 18 geographic districts of Hong Kong into high, medium, and low-SES strata based on their median household incomes (Census and Statistics Department, 2019). We then randomly contacted public kindergartens until one in each stratum agreed to participate in the study. As the kindergarten from the low-SES stratum had been small in size, we recruited one more kindergarten from that stratum.

The study was conducted between December 2020 and January 2021, when Hong Kong entered its fourth wave of COVID-19 outbreak. As clusters of cases with unknown sources of infection were identified and vaccines were not yet available, all schools had to suspend face-to-face teaching and educate their students using online activities. These activities varied considerably across kindergartens, in dosage, content, and format (e.g., synchronous lessons, premade videos, and existing websites), as there was no standardized kindergarten curriculum in Hong Kong. About 95% of all households in Hong Kong had access to the Internet. But, apart from online learning activities, many kindergartens prepared weekly take-home packages—which contained notices, games, and worksheets—to support child learning. Through these packages, we sent invitation letters, consent forms, and paper-and-pencil questionnaires to 467 families from the four kindergartens. Eventually, 236 mothers returned signed consent forms and completed questionnaires and provided demographic information. Each participant received a coupon of about US$6 afterward. The procedures were approved by our University’s Human Research Ethics Committee.

Hong Kong children attended kindergarten between the age of about 48 and 72 months. In our sample, children’s averaged 55.91 months in age, and 75% of them were girls. Most mothers (65%) were aged between 31 and 40 years, and 39%, 17%, and 44% of them had completed secondary school, higher diploma or associate degree programs, and college degree programs, respectively. About 36% of 30- to 39-year-old women had completed college degree programs in Hong Kong (Census and Statistics Department, 2019). Therefore, participating mothers were better educated than their same-age peers.

**Measures**

Items were presented in Chinese. Ratings for each measure were averaged; higher scores indicated higher levels of the construct.
Maternal involvement in child online learning was assessed using a 6-item measure developed by us. On a 5-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), mothers rated their involvement in their children’s online learning using the following items: “I participate in online learning activities with my child,” “I complete online learning activities with my child,” “I ask my child what he or she has learned in online learning activities,” “I go through online learning activities again with my child,” “I attend to what my child has learnt in online learning activities,” and “I arrange online learning activities for my child.” These items were developed based on studies on Chinese parents’ experience of helping their children learn at home during the pandemic (Dong et al., 2020; Lau & Lee, 2020).

Maternal mindfulness was assessed using the 10-item Cognitive and Affective Mindfulness Scale Revised (Feldman et al., 2007). On a 5-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), mothers rated their mindfulness (e.g., “I am able to focus on the present moment”).

Child pre-academic ability was assessed using a 4-item measure (Lam & Chung, 2017). On a 5-point scale ranging from 1 (Very Poor) to 5 (Very Good), mothers rated their children’s Chinese, English, Math, and general learning ability (e.g., “This child’s Chinese ability is…”).

Child internalizing and externalizing behaviors were assessed using The Strengths and Difficulties Questionnaire (Goodman, 1997). On a 3-point scale ranging from 0 (Very Untrue) to 2 (Very True), mothers used 10 items to rate their children’s internalizing behaviors (e.g., “My child is often unhappy, downhearted, or tearful”) and 10 items to rate their children’s externalizing behaviors (e.g., “My child is constantly fidgeting or squirming”).

Maternal use of technology to occupy the child was assessed using a 6-item measure (Radesky et al., 2016). On a 5-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), mothers rated whether they occupy their children with devices (e.g., “I use smartphones or tablets to keep my child quiet”).

Results

Analyses were conducted with SPSS 26. About 1% of our data were missing completely at random, Little’s MCAR test $X^2(11) = 7.92$, n.s. Pairwise deletion was used to deal these missing data (Newman, 2014).

Table 1 shows the descriptive statistics of variables. Children were generally well-functioning, their scores averaging on the higher end of the pre-academic ability measure and the lower ends of the measures of internalizing and externalizing behaviors. In support of its validity, maternal involvement was associated positively and negatively with child pre-academic ability and externalizing behaviors, respectively. Moreover, maternal mindfulness was associated negatively with child internalizing and externalizing behaviors. The three outcome measures were weakly correlated with one another, indicating that they were overlapping but distinct constructs. All substantive variables were normally distributed, their skewness ranging from $-0.19$ to $1.09$. 
**Table 1.** Descriptive statistics of variables.

|                 | M   | SD  | Range | (1)  | (2)  | (3)  | (4)  | (5)  | (6)  | (7)  | (8)  | (9)  | (10) |
|-----------------|-----|-----|-------|------|------|------|------|------|------|------|------|------|------|
| (1) C gender    | —   | —   | 0–1   | —    |      |      |      |      |      |      |      |      |      |
| (2) C age       | 55.91 | 5.56 | 30–96 | 0.07 | —    |      |      |      |      |      |      |      |      |
| (3) M age       | 3.09 | 0.58 | 2–4   | 0.24** | 0.12 | —    |      |      |      |      |      |      |      |
| (4) M technology use to occupy C | 1.93 | 0.73 | 1.00–4.00 | −0.06 | −0.06 | −0.03 | 0.89 |      |      |      |      |      |      |
| (5) M education | 4.04 | 0.92 | 2–5   | 0.26** | 0.09 | 0.27** | −0.14* | —    |      |      |      |      |      |
| (6) M involvement in C learning | 3.86 | 0.55 | 1.83–5.00 | 0.07 | −0.01 | −0.03 | −0.02 | −0.03 | 0.80 |      |      |      |      |
| (7) M mindfulness | 3.62 | 0.51 | 2.10–5.00 | −0.01 | −0.06 | 0.06 | −0.32** | 0.09 | 0.17** | 0.86 |      |      |
| (8) C pre-academic ability | 3.44 | 0.58 | 2.00–5.00 | 0.15* | 0.17** | 0.08 | −0.06 | 0.28** | 0.21** | 0.11 | 0.79 |      |
| (9) C internalizing behaviors | 0.46 | 0.27 | 0.00–1.50 | −0.26** | 0.03 | −0.13 | 0.20** | −0.02 | −0.08 | −0.18** | −0.17** | 0.64 |
| (10) C externalizing behaviors | 0.65 | 0.34 | 0.00–1.70 | −0.17** | −0.13 | −0.18** | −0.30** | −0.30** | −0.18** | −0.30** | −0.25** | 0.35** | 0.76 |

Notes. C = Child. M = Mother. Internal reliabilities (Cronbach’s alphas) are presented in the diagonal.
* p < .05. ** p < .01.
We ran separate regression models for the three outcome variables. We entered the control variables in Step 1, the centered versions of maternal involvement and mindfulness in Step 2, and the interaction between the centered versions of maternal involvement and mindfulness in Step 3. We probed significant interactions by testing the association between maternal involvement and child adjustment separately for children whose mothers had high (+1 SD) versus low (−1 SD) mindfulness scores.

Results indicated that maternal involvement in child online learning was associated positively with child pre-academic ability and negatively with child internalizing behaviors, but such associations were only significant for children with more mindful mothers (see Figure 1). Maternal mindfulness did not moderate the negative association between maternal involvement and child externalizing behaviors. Overall, the models explained 17%, 15%, and 24% of variance in child pre-academic ability, internalizing behaviors, and externalizing behaviors, respectively. Table 2 shows the standardized coefficients of the final models. Additional details are presented in the Supplementary Material file.

**Discussion**

Many schools have to suspend face-to-face classes because of COVID-19. Parents may play a crucial role in facilitating the online learning of their kindergarten-aged children, who may have difficulties understanding abstract concepts through the Internet, given their developmental immaturity (Radesky et al., 2015). Consistent with an ecological perspective (Lam & McHale, 2015) and a model of mindful parenting (Duncan et al., 2009), our findings indicated that maternal involvement in child online learning was associated with higher child pre-academic ability and lower child internalizing behaviors, although such associations were only significant for children with more mindful mothers. Maternal mindfulness did not moderate the association of maternal involvement with child externalizing behaviors, however.

Research has demonstrated that the mere presence of a supervising adult may reduce youth’s externalizing behaviors (Lam & McHale, 2015). Therefore, regardless of whether or not the adult is paying full attention, young children who engage in more activities

![Figure 1. Associations of maternal involvement in child online learning with child pre-academic ability and internalizing behaviors by maternal mindfulness.](image-url)
together with their mothers may exhibit fewer behavioral problems. In contrast, in order for children to have more internalized changes, including schemata assimilation and accommodation (e.g., acquiring academic knowledge) and emotional capacity building (e.g., establishing emotional well-being), the ability of the mothers to focus on the present moment and navigate the experience together with the children may be key (Duncan et al., 2009). As this study was based on cross-sectional data from only one sample, our results should be treated as hypothesis generating. One interesting hypothesis to be tested, for example, is whether maternal involvement and mindfulness are differentially associated with internalizing versus externalizing child outcomes. However, our findings appeared to suggest that, when helping their children learn via the Internet, it may be important for mothers to be as mindful as possible so that they can build connections with their children and optimize their children’s awareness. The COVID-19 pandemic may—hopefully—come to an end soon, but online learning is likely to stick around. Therefore, future researchers should reexamine the link between online learning and child adjustment in the post-pandemic era, when online learning may be part of the “new normal.”

This study had several limitations. First, our cross-sectional design limited our ability to draw causal conclusions. Our findings could also mean that children’s academic and emotional struggles might have a negative impact on their mothers—a child-driven interpretation. Longitudinal designs are needed to capture the temporal associations between maternal involvement and child adjustment. Second, our findings were based solely on mothers’ reports and might be affected by common method variance. Further studies should retest our hypotheses using multi-method, multi-informant data. Third, although we had used a stratified sampling approach to recruit kindergartens, only about 50% of families from these kindergartens eventually participated in the study. And, due to ethical constraints, we did not collect any information from or about the non-participating families, which might or might not reduce the representativeness of our sample. In fact, as reflected by the maternal education level, our sample seemed to be of higher SES. We did

### Table 2. Regression models of child adjustment.

|                                      | Pre-academic ability | Internalizing behaviors | Externalizing behaviors |
|--------------------------------------|----------------------|-------------------------|------------------------|
|                                      | β        | t values | β          | t values | β          | t values |
| C gender                             | 0.08    | 1.19     | −0.26**   | −3.95   | −0.07     | −1.09    |
| C age                                | 0.15*   | 2.47     | 0.05      | 0.74    | −0.10     | −1.62    |
| M age                                | −0.01   | −0.20    | −0.09     | −1.29   | −0.08     | −1.33    |
| M technology use to occupy C         | 0.01    | 0.08     | 0.16*     | 2.45    | 0.20**    | 3.20     |
| M education                          | 0.23**  | 3.57     | 0.11      | 1.64    | −0.21**   | −3.36    |
| M involvement in C learning          | 0.22**  | 3.46     | −0.05     | −0.79   | −0.15**   | −2.56    |
| M mindfulness                        | 0.04    | 0.55     | −0.10     | −1.50   | −0.19**   | −2.97    |
| M involvement X M mindfulness        | 0.14*   | 2.29     | −0.14*    | −2.18   | —         | —        |

**Notes.** C = Child. M = Mother.
* p < .05. ** p < .01.
not collect any information about sexual orientation or disability from our participants either. Taken together, generalization of our findings should be made with caution. Fourth, the abrupt need for young children to learn via the Internet motivated our focus on maternal involvement in child online learning. However, due to resource constraints, we did not assess general maternal involvement. Whether general involvement versus involvement in child online learning may be differentially linked to child adjustment awaits further investigation. Similarly, mothers’ general mindfulness (Feldman et al., 2007) and mothers’ mindfulness while parenting their children (Duncan et al., 2009) are overlapping yet distinct constructs. Whether maternal mindful parenting may moderate the link of maternal involvement in child online learning with child adjustment awaits further investigation as well. Fifth, we only focused on maternal involvement, although fathers and mothers may play unique roles in child development (Lam & McHale., 2015). Future efforts should be directed at examining the implications of paternal and maternal involvement in child online learning. Finally, we sought to examine whether maternal involvement was linked to normal variation in child adjustment. Additional studies are needed to explore whether maternal involvement was linked to normal versus clinical levels of child adjustment, such as by comparing the child adjustment scores to the population norms.

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Open research statement

As part of IARR’s encouragement of open research practices, the author(s) have provided the following information: This research was not pre-registered. The data used in the research cannot be publicly shared but are available upon request. The data can be obtained by emailing Chun Bun Lam via ianlam@eduhk.hk.

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Supplemental material

Supplemental material for this article is available online.
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