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**Psychometric Properties of the Chinese Version of the Multidimensional
Assessment of Parenting Scale (MAPS)**

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Abstract

Parenting practices have been linked to a wide range of issues related to children's psychological adjustment; however, more research is warranted to further understand not only cultural variations of parenting norms, but also how such variations might differentially influence child outcomes. The current study examined the psychometric properties of a Chinese translation of the Multidimensional Assessment of Parenting Scale (MAPS) in order to: 1) assess both positive and negative dimensions of parenting in Chinese-speaking societies, and 2) to explore the relationships between these practices and children's psychopathological symptoms. A total of 2237 parents with children between 6-12 years old completed the MAPS, Interpersonal Mindfulness in Parenting Scale (IM-P), adapted Parental Bonding Instrument (PBI), and other measures related to children's psychosocial functioning. Exploratory and confirmatory factor analyses revealed a clear six-factor structure. Results demonstrated adequate psychometric properties in terms of internal consistency and test-retest reliability. MAPS subscales also showed concurrent and convergent validity with mindful parenting, parent-child bonding, and children's psychopathology outcomes. The importance of using culturally validated dimensional measures of parenting is discussed in this paper.

Keywords: broadband parenting, Chinese translation, validation, child psychopathology

Psychometric Properties of the Chinese Version of the Multidimensional Assessment of Parenting Scale (MAPS)

Recognized as an important research topic, parenting has commanded considerable interest and attention from different fields of study (e.g., Belsky, 1984; Darling & Steinberg, 1993; Schludermann & Schludermann, 1970). For example, in clinical psychology, the direct and indirect roles of parenting on child psychopathology (e.g., child externalizing/internalizing symptoms) and later cognitive and social outcomes have been extensively studied for several decades, both theoretically and empirically (Lovejoy et al., 1999; McKee et al., 2013). During this time, a number of questionnaires have emerged assessing parents' thoughts, feelings, and attitudes towards parenting as well as their specific parenting behaviors. Through this work, researchers have identified two broad domains of parenting styles – warmth vs. hostility and autonomy vs. control - that have been found to differentially impact children's behavioral health outcomes (Baumrind, 1967; Baumrind, 1991; Rodriguez, Donovan, & Crowley, 2009; Schaefer, 1959). For instance, in a meta-analysis, parental warmth and autonomy granting were shown to be negatively correlated with child externalizing problems, while parental hostility and psychological control were shown to be *positively* correlated with child externalizing problems (Pinquart, 2017). With these advancements, however, several considerations have been underscored, including the influence of culture on parenting norms (Kim, 2002) and, relatedly, the importance of validating assessments of parenting to account for differences across cultures.

Numerous studies have revealed that parents from different cultures approve of different child-rearing behaviors (Liu & Guo, 2010). For example, in China, which is widely recognized as a collectivistic culture based on Confucianism legacy, specific cultural values (e.g., social interdependence, conformation and obedience to norms and authority) likely impact and inform

parents' beliefs and behaviors (Costigan & Su, 2008; Chao & Tseng, 2002). Compared to parents from Western cultures, traditional Chinese parents are generally characterized as authoritarian caregivers in that they are more likely to approve of high levels of harsh discipline, engage in fewer verbal expressions of love, and put stronger emphasis on children's academic achievement (Deater-Deckard et al. 2011; Lin & Fu 1990; Liu & Merritt, 2018; Matsumoto et al., 2008, Wu et al. 2002). These parenting practices may, in turn, promote culturally desirable behaviors in children (e.g., obedience; Liu & Guo, 2010), which may help to explain why the associations between harsh and controlling parenting practices and negative child outcomes observed in Western families have not been consistently observed in Chinese samples. For instance, several parenting practices, that are generally considered negative (e.g., psychological control) and are typically associated with maladjustment in children in Western societies, appear to have no such effect on Chinese children (Chua, 2011). To the contrary, some studies have found that children of authoritarian parents in China exhibit higher academic performance and lower levels of depressive symptoms (e.g. Dornbusch et al., 1987; Li et al., 2010). However, parenting ideologies and practices may also be shaped by societal changes (Way et al. 2013). Over the past several decades, China has been subject to rapid progressive change due to the influence of globalization and China's continuous economic reform. A more child-centered approach of parenting has been gradually adopted in urban areas of China, and especially among parents of higher educational attainment (Li et al., 2018; Xu et al., 2005). For instance, Chang and colleagues (2011) found that in some urban areas, Chinese parents strongly endorsed Western-based values (i.e., promoting independence and self-confidence) in socializing their children. Further, similar correlations between parenting and youth outcomes were observed for these families as previously observed in Western families. For example, Chinese parents' support for

autonomy was associated with fewer depressive symptoms among children in middle childhood (Yan et al., 2017). These findings highlight a blending of traditional Chinese and Western approaches to parenting, and suggest that more updated studies are needed to explore how current practices in Chinese societies influence children's psychological wellbeing.

Although existing measures of parenting have contributed to our broad understanding, there are notable limitations that have hindered our capacity for greater depth. Among the limitations of existing parenting measures is the fact that few have assessed both positive and negative dimensions simultaneously (Darling & Steinberg, 1993). For example, existing literature has commonly used measurements of only one dimension of parenting, such as negative parenting, to predict child or adolescent psychopathology (Darling & Steinberg, 1993; McKee et al., 2013). Examining both dimensions of parenting could have important clinical implications for the intervention and prevention of negative child outcomes, as multidimensional assessments may provide a more accurate depiction of parenting practices than traditional unidimensional assessments (Parent & Forehand, 2017). Moreover, many existing self-report parenting questionnaires have significant psychometric issues, such as low reliability and un-tested measurement invariance (Parent & Forehand., 2017, Tourangeau et al., 2000). As a result, many researchers have argued for using measurements with better psychometric properties, as well as assessments that are sensitive to changes across developmental periods (O'Connor, 2002). Ceiling or floor effects have also been commonly observed in measures of parenting (Kazdin, 2003), emphasizing a need to better identify the ranges of scores. Lastly, there can be significant differences in parenting behaviors and values across cultures as previously discussed. Although existing scales related to parenting (e.g., Parental Bonding Instrument, PBI; Interpersonal Mindfulness Parenting Scale, IM-P) have been validated and widely utilized in Hong Kong and

Mainland China, these scales primarily focus on parenting styles (i.e., authoritative, authoritarian, permissive, uninvolved) or a specific aspect of parenting (i.e., mindful parenting; Duncan et al., 2009; Parker, Tupling, & Brown, 1979). As such, the field lacks a well-established multidimensional assessment of parenting practices with strong psychometric properties of scale scores from Chinese parents.

Parent and Forehand (2017) proposed a comprehensive 34-item Multidimensional Assessment of Parenting Scale (MAPS) with the aim of overcoming the previously described limitations in parenting research. The MAPS was developed to measure multidimensional parenting practices, targeting American parents of children in early childhood through adolescence. The MAPS scores have demonstrated strong psychometric properties, including high reliability and initial support for validity in longitudinal analyses, and became a useful tool for simultaneously assessing both positive (e.g., warmth) and negative (e.g., harshness) aspects of parenting across developmental stages. For instance, the prominent links between broadband positive/negative parenting and children's externalizing/internalizing problems have been verified among early childhood (3-7 years old), middle childhood (8-12 years old), and adolescence (13-17 years old) (e.g., Parent & Forehand, 2017; Riley et al., 2019). Given the assumption that parenting norms vary across cultures (Leung et al., 1998, Smith & Dishion, 2013), it is necessary to explore the reliability and validity of the MAPS among parents in countries outside of the United States (US) - both as a means of accurately assessing parenting practices across cultures and of facilitating cross-cultural research on parenting and child development.

To date, no study has explored the psychometric properties of the MAPS in a non-US sample. Thus, the aim of the current study is to assess the psychometric properties of a Chinese

(Mandarin) translation of the MAPS. First, factor structure, internal consistency and test-retest reliability for the Chinese MAPS was assessed. Second, confirmatory factor analysis (CFA) was used to confirm the factor structures of the Chinese MAPS in conjunction with a concurrent validity test. Theoretical and empirical research have linked both mindful parenting and parenting styles with specific parenting practices (e.g., Duncan et al. 2009a, Han et al., 2019). For example, parents who reported higher levels of mindful parenting were more likely to support children's autonomy and endorse greater sensitivity to children's needs during parent-child interactions (Duncan et al. 2009; Parent et al. 2016). In addition, negative parenting styles (e.g., overprotective style) have been shown to correlate with parents' controlling behaviors, whereas positive parenting styles (e.g., caring style) have been shown to correlate with parents' active involvement in child rearing (Safford, Alloy, & Pieracci, 2007). Given such research, both constructs were selected as criterion variables to test the concurrent validity of the Chinese MAPS. Then the measurement invariances across the child gender, parent gender, and child age were tested in sequence. Finally, convergent validity was assessed by testing the associations between the Chinese MAPS and a series of children's psychopathological outcomes (e.g., externalizing and internalizing problems, emotion regulation).

Method

Participants

Participants were recruited through flyers distributed throughout the community and electronically through communication websites for parents in Mainland China. All procedures were reviewed and approved by the Institutional Review Board of the sponsoring university. 2237 parents of children between the ages of 6 and 12 years-old participated in the current study (mean age of child = 9.40 years, $SD = 1.78$, 48.1% female; mean age of parent = 38.46 years, SD

= 4.43, 23% fathers). Participants were largely of Han ethnicity (93.8%), well-educated (56.9% with at least a college degree), and employed either full-time (67.2%) or part-time (13.7%). 70.3% of the families reported living in households with an annual income at or above average for urban Chinese families (approximately \$17,316 annually; National Bureau of Statistics of the People's Republic of China 2017). Participants' demographics are shown in Table 1.

The sample was randomly divided into two independent subsamples using the random sampling procedure by SPSS, with both subsamples normally distributed. One sample (sample A, $N=1136$) consisted of nearly 50% of the total number used for Exploratory Factor Analysis (EFA), whereas the other sample (sample B, $N = 1101$) was used for Confirmatory Factor Analysis (CFA). To assess test-retest reliability, a subgroup of parents who had agreed to complete the questionnaire for a second time were assessed four weeks later ($N = 423$).

Procedures

With the permission of the original authors of the MAPS, the questionnaire was forward- and back-translated by a group of Chinese psychology professors who specialize in parenting and are fluent in both Chinese and English. The back translated version was sent to the original author for comparison; any inconsistencies were discussed, clarified and resolved. These resolved changes were then applied to the translated Chinese version accordingly. Chinese culture and language particularities were also extensively taken into account during the translation. The updated version was then back-translated again and sent to the original author. The final Chinese questionnaire was agreed upon once all parties were satisfied with the translated and back-translated versions, and was sent out to a group of Chinese parents to ensure that they understood all items clearly. The above steps confirmed that the updated Chinese

version of the MAPS was consistent with the English version and, thus, was acceptable for further evaluation.

After signing the informed consent, parents were asked to fill out a series of questionnaires through the online Qualtrics Survey Software (Qualtrics Labs, Inc., 2012). In cases where families had multiple children, parents were asked to select one child who was within the required age range (i.e., 6 to 12 years old) and to provide their responses with respect to the selected child. The families received feedback on their parenting as well as on their children's psychological well-being based on their responses to the questionnaire.

Measures

Multidimensional Assessment of Parenting Scale (MAPS; Parent &Forehand, 2017). The 34 items of the original MAPS were selected from several well-established parenting scales: The Alabama Parenting Questionnaire (APQ; Frick, 1991), the Parenting Practices Questionnaire (PPQ; Block, 1965; Robinson, Mandleco, Olsen, & Hart, 1995), the Parenting Scale (PS; Arnold, O'Leary, Wolff, & Acker, 1993), the Management of Children's Behavior Inventory (MCBS; Perepletchikova & Kazdin, 2004), the parent report version of the Children's Report of Parenting Behavior Inventory (CRPBI; Schaefer, 1965; Schludermann & Schludermann, 1970), the Parent Behavior Inventory (PBI; Lovejoy, Weis, O'Hare, & Rubin, 1999), the Parenting Young Children scale (PARYC; McEachern et al., 2012), and the Parental Monitoring Scale (PM; Stattin & Kerr, 2000). The final adapted version included seven domains of parenting practices and two broadband domains (i.e., positive and negative parenting). The broadband positive subscale consisted of items representing proactive parenting (e.g., "I provide my child with a brief explanation when I discipline his/her misbehavior"), positive reinforcement (e.g., "If I give my child a request and she/he carries out the request, I praise her/him for listening and

complying”), warmth (e.g., “My child and I hug and/or kiss each other”), and supportive parenting practices (e.g., “I listen to my child’s ideas and opinions”). The 18-item negative parenting subscale included items representing parental hostility (e.g., “I explode with anger toward my child”), lax control (e.g., “I feel that getting my child to obey is more trouble than it’s worth”), and physical control (e.g., “I use physical punishment (for example, spanking) to discipline my child because other things I have tried have not worked”). Each item was rated on a 5-point Likert scale ranging from 1 (never) to 5 (always). Higher scores reflected higher levels of certain dimensions of parenting behaviors (i.e., positive, negative). The original MAPS demonstrated excellent psychometric properties and has been used with children across multiple developmental stages (Parent, McKee, Rough, & Forehand, 2016). Reliability for the current study was strong for both the positive, $\omega = .90$, and negative broadband parenting scales, $\omega = .88$.

Interpersonal Mindfulness Parenting Scale (IM-P; Duncan et al., 2009) Mindful parenting behaviors were assessed by parents’ composite scores on the Interpersonal Mindfulness Parenting Scale. The Chinese version of the IM-P has demonstrated good psychometric properties (Lo et al., 2018) and was used in the current study. The 39-item inventory has five subscales corresponding to a variety of mindful parenting behaviors: (1) listening with full attention (e.g., “I rush through activities with my child without being really attentive to him/her”); (2) emotional awareness of self and child (e.g., “How I am feeling tends to affect my parenting decisions, but I do not realize it until later”); (3) self-regulation in the parenting relationship (e.g., “I often react too quickly to what my child says or does”); (4) nonjudgmental acceptance of self and child (e.g., “I have difficulty accepting my child’s growing independence”); and (5) compassion for self and child (e.g., “When I do something as a parent that I regret, I try to give myself a break”). Parents provided their responses using a 5-point

Likert scale ranging from 1 (never true) to 5 (always true), with higher scores indicating higher levels of mindful parenting. Reliability was good for the current sample, $\omega = .84$.

Parental Bonding Instrument (PBI; Parker et al., 1979) An additional measurement of parenting was utilized in the current study. In the Chinese version of the PBI, item 13 was removed due to inadequate psychometric properties (Yang, Zhou, Chu, Liu, & Liu, 2009). The PBI is an important indicator of the two dimensions of parenting styles (i.e., overprotection and care), but given that children in the current study were in middle childhood and the literacy comprehension was uneven across children, we carefully adapted the original version to parents' self-report. The care subscale measures parental warmth towards their children (e.g., "I let my child do those things he/she likes doing"), and the overprotection scale measures the extent to which parents want to regulate children strictly and intrusively, and have demands for high accomplishment and obedience (e.g., "I try to control everything my child does"). Items were rated on a 3-point Likert scale ranging from 1 (strongly disagree) to 3 (strongly agree). Such methods of modifying only the subject without changing any content of the measure has been commonly applied in parenting literature (e.g., Xie et al., 2019). Our parent report version also obtained good internal reliability, with $\omega = .85$ and $\omega = .73$ for the care and overprotection scales, respectively.

Brief Problem Monitor-Parent Form (BPM-P; Achenbach et al., 2011) Children's externalizing, internalizing, and attention problems were measured with the Brief Problem Monitor-Parent Form. Nineteen items of BPM-P were adapted from the Child Behavior Checklist (CBCL; Achenbach 1991), especially for children ages 6 to 18 years old. The attention problems subscale consists of six items (e.g., "Can't concentrate, can't pay attention for long"), the externalizing problems subscale consists of seven items (e.g., "Disobedient at home"), and

the internalizing problems subscale consists of six items (e.g., “Feels too guilty”). Parents provided responses using a 3-point Likert scale ranging from 0 (not true) to 3 (very true), with higher scores indicating a greater level of behavioral and emotional problems in children. The Chinese version of BPM-P was translated and back-translated by three associate professors of psychology and sent to the original author to ensure that all items retained the original meanings. Reliability of the BPM-P in the current study was $\omega = .82$ for attention problems, $\omega = .77$ for externalizing problems, and $\omega = .81$ for internalizing problems.

Child Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997) The Emotion Regulation Checklist is a parent-report measure that assesses children’s ability to regulate their emotions. The measure consists of 24 items comprising two subscales: 1) Emotion Regulation (e.g., “Responds positively to neutral or friendly approaches by peers”) and 2) Liability/Negativity (e.g., “Exhibits wide mood swings”). Parents rated the extent to which the descriptions accurately reflected their child’s emotions or behaviors using a 4-point Likert scale ranging from 1 (not at all like this) to 4 (exactly like this). The ERC displayed good convergent and discriminant validity in prior studies with Chinese samples (Chang et al., 2003; Han et al., 2015). In the current study, reliability for the emotion regulation subscale was $\omega = .70$, and $\omega = .82$ for the emotion negativity subscale.

Data Analysis

First, we applied a two-step factor analysis approach to examine the factor structure of the Chinese version of the MAPS. Sample A was used to perform an exploratory factor analysis (EFA) and a series of reliability analyses, whereas sample B provided data for a confirmatory factor analysis (CFA) and other validity analyses, including concurrent validity, convergent validity, and measurement invariance.

Results

Factor structure of the Chinese version of the MAPS

To test the factorial structure of the MAPS using sample A, EFA analysis with Geomin oblique rotation and maximum likelihood estimation (ML) were carried out using Mplus Version 7.0 (Muthén & Muthén, 2012). Based on 34 items, seven alternative models were examined which are shown in Table 2. As observed, the fit indices of model 7 were acceptable and significantly better than those of model 1 to model 6. Therefore, a seven-factor structure was most suitable for the data, as it had adequate fit indices of RMSEA, CFI, TLI, and SRMR and was similar to the original English version of the MAPS.

Factor loadings for each item in model 7 were further assessed as shown in Table 3. Items with factor loadings $\leq .30$ or cross loadings $\geq .30$ were considered to have a poor fit to the factor structure. Three items (11, 18, and 19) had cross loadings larger than .30, but were kept due to structural and cultural considerations. The first was item 11: *If my child does his/her chores, I will recognize his/her behavior in some manner*. This item had a loading of .30 under the Positive Reinforcement factor, which was its original factor in the English version, and a loading of .45 under the Supportiveness factor. The second was item 18: *If I give my child a request and she/he carries out the request, I praise her/him for listening and complying*. This item had a loading of .35 under the Positive Reinforcement factor (its original factor in the English version) and .46 under the Supportiveness factor. If we had deleted items 11 and 18, there would have only been two items left in the Positive Reinforcement subscale, which would consequently impair the item representation of the factor. In addition, the phrasing of both items was semantically closer to positive reinforcement when considered in Chinese; thus, items 11 and 18 were kept in the Positive Reinforcement subscale despite their comparatively moderate loadings.

The third was item 19: *I warn my child before a change of activity is required (such as a five-minute warning before leaving the house in the morning)*. This item had a loading of .30 under Proactive Parenting in the original version of the MAPS and a loading of .36 under the Supportiveness factor in the Chinese version. After a careful examination of the semantic contents of item 19 and its associations with different factors, item 19 was kept in the Proactive Parenting subscale. Additionally, item 28 (*I tell my child my expectations regarding behavior before my child engages in an activity*) had a loading of .46 under the Positive Reinforcement factor but only .02 under the original factor of Proactive Parenting. Considering that in Chinese culture, parents' expectations for their children function as a method of reinforcement, such as reinforcing the goals of academic achievements (Chua, 2011), as well as the fact that all of these items load onto the broadband positive parenting factor, item 28 was moved from the Proactive Parenting factor to the Positive Reinforcement factor. Finally, the 34 items were used in all further analyses. The names for the seven factors from the English version were maintained Proactive Parenting, Positive Reinforcement, Warmth, Supportiveness, Hostility, Lax Control, and Physical Control, to make the two versions comparable.

Reliability

To determine the internal consistency of the items, McDonald's omega (ω) was calculated. Omega was utilized in the current study rather than Cronbach's α because of arguments that α is not an appropriate measure of reliability (Hayes & Coutts, 2020). Table 4 shows the omega coefficients for each subscale, the range of inter-item correlations, and the mean of each inter-item correlation. The internal consistency of each subscale was satisfactory, except for Lax Control ($\omega = .62$), which showed moderate internal consistency. However, the inter-item correlations only ranged from .10 to .41 for the Lax Control subscale. In addition, there was a

subset of 423 participants who completed a retest 4 weeks after the first round of data collection. The test-retest reliability of the total Chinese version of the MAPS was found to be slightly lower than the original English version, demonstrated by the fact that the reliability coefficients for the subscales ranged from .56 to .73 across time. See Table 4 for additional information on the internal consistency and test-retest reliability of each subscale.

More specifically, the subscale of Lax Control demonstrated comparatively low internal consistency and inter-item correlations. When comparing the items of the Lax Control subscale with those of the original version, we found that the construct may have different meanings for Chinese parents compared to their Western counterparts. For instance, item 23 (*I feel that getting my child to obey is more trouble than it is worth*) and item 27 (*I give in to my child when she/he causes a commotion about something*) both reflect parental laxity and compromise on child obedience. Although socioecological changes in urban China may be encouraging authoritative parenting practices in China, existing evidence suggests that certain traditional cultural values, such as high control, are still the norm (Chen, Sun, & Yu, 2015; Li et al., 2010; Xu et al., 2005). Thus, the opposite to high control or laxity may not mean permissiveness for Chinese parents, but rather a total neglect of children's needs. Given the low internal consistency and the potential different meanings of these practices in Chinese cultures, the Lax Control subscale was omitted. The goodness of fit for the final model is presented in Table 2.

Confirmatory Factor Analysis (CFA)

A CFA analysis was performed to verify the psychometric properties of the six-factor model of the Chinese MAPS using sample B ($N = 1101$). The results showed that the initial model (model 1) fit the data, but not ideally, $\chi^2 = 1247.55$, $df = 309$, $p < .001$, CFI = .92, TLI = .91, RMSEA = .06. Based on the modification indices, we found that some items conveyed

similar meanings when expressed in Chinese. For example, the expression of *affection* in item 1 (*I express affection by hugging, kissing, and holding my child*) and the expression of *close relationship* in item 21 (*My child and I hug and/or kiss each other*) were quite parallel in Chinese language. Items 6 (*The punishment I give my child depends on my mood*) and 29 (*When I am upset or under stress, I am picky and on my child's back*) unanimously stated that certain parenting behaviors depend on the emotions of parents in Chinese language. In addition, the word *physical punishment* appeared in items 25 (*I use physical punishment as a way of disciplining my child*) and 31 (*I use physical punishment (for example, spanking) to discipline my child because other things I have tried have not worked*), which have similar meanings in Chinese language. Thus, we set free the covariances between items mentioned above and a better-fitting model (model 1-R) emerged, $\chi^2 = 1005.38$, $df = 306$, $p < .001$, CFI = .94, TLI = .93, RMSEA = .05. The fit indices suggested that the data fit model 1-R well, with RMSEA values and SRMR values less than .08 and CFI and TLI close to .90 (Hu & Bentler, 1999). Therefore, model 1-R appeared to be the best fit for the data. These results are shown in Table 5. The loadings of each item on the corresponding latent construct in the final six-factor model are reported in Table 6. All loadings for the items on the corresponding latent variables were statistically significant ($ps < .001$).

Broadband factor structure. In order to examine hierarchical factor structure and test if a broadband positive and negative parenting factor structure of the original MAPS was supported, a higher-order CFA model was used. The higher-order model with broadband positive and negative factors demonstrated good fit, $\chi^2 (317, N = 1066) = 1082.16$, $p > .10$, RMSEA = .048, 95% CI .044 - .051, CFI = .92, SRMR = .061. Proactive Parenting (.86), Positive Reinforcement (.92), Warmth (.69), and Supportiveness (.95) all had significant factor loadings onto the

Broadband Positive Parenting factor. Additionally, Hostility (.83) and Physical Control (.88) had significant factor loadings on the Broadband Negative Parenting factor.

Measurement invariance. A multiple-group CFW model was employed to examine and test whether measurement invariance across the child gender, parent gender, and child age was supported. Three different forms of measurement invariance were tested: configural (i.e., identical factor structure for each stage), metric (factor loadings are held equal across groups), and scalar (factor loadings and intercepts/thresholds are held equal across groups). Chi-square difference tests between the configural, metric, and scalar models across child gender were all nonsignificant (all $ps > .20$), supporting strong measurement invariance of subscales for boys and girls. Similarly, measurement invariance tests for child developmental stage supported strong measurement invariance of the MAPS across childhood (ages 6-8) and early adolescence (ages 9-12) with comparisons between configural, metric, and scalar models all non-significant (all $ps > .20$). However, chi-square difference tests between the configural and metric models across parent gender was nonsignificant ($p = .575$) but the comparison between metric and scalar models was significant ($p < .001$) which supports partial measurement invariance across mother and father informants on the MAPS.

Concurrent Validity

The Pearson correlations among the Chinese MAPS, IM-P, and PBI were investigated to test the concurrent validity of the MAPS, its six factor subscales, and the two broadband subscales. Table 7 shows the corresponding correlation coefficients. The results showed that the correlation between the broadband positive parenting and PBI Care scores was significant. The subscales of the broadband positive parenting and PBI Care score also showed moderate to strong positive correlations (total score: $r = .58, p < 0.001$; Proactive Parenting: $r = .46, p <$

0.001; Positive Reinforcement: $r = .44, p < 0.001$; Warmth: $r = .44, p < 0.001$; Supportiveness: $r = .55, p < 0.001$) and similar results for the PBI Overprotection subscale (total score: $r = -.17, p < 0.001$; Positive Parenting: $r = -.13, p < 0.01$; Positive Reinforcement: $r = -.15, p < 0.001$; Warmth: $r = -.11, p < 0.001$; Supportiveness: $r = -.107, p < 0.001$). The broadband negative parenting score and its subscales exhibited significant negative correlations with the PBI Care subscale (total score: $r = -.35, p < 0.001$; Hostility: $r = -.34, p < 0.001$; Physical Control: $r = -.30, p < 0.001$) and significant positive correlations with the PBI Overprotection subscale (total score: $r = .09, p < 0.001$; Hostility: $r = .09, p < 0.01$; Physical Control: $r = .08, p < 0.05$).

Correlations were also computed between MAPS and IM-P scores. As we expected, the total score on the IM-P was positively correlated with broadband positive parenting as measured by the MAPS ($r = .65, p < 0.001$), and negatively correlated with broadband negative parenting ($r = -.56, p < 0.001$). Furthermore, correlations among the six subscales of the MAPS and the total IM-P score ranged from $-.46$ to $.68$ ($ps < .001$). Significant correlations were found between the MAPS's two broadband factors and all factors of the IM-P, with Pearson correlation coefficients ranging from $.41$ to $.53$ (all $ps < 0.001$) for positive parenting and $-.57$ to $-.30$ (all $ps < 0.001$) for negative parenting.

In general, there were satisfactory correlations between the MAPS and IM-P as well as between the MAPS and PBI, supporting good concurrent validity of the Chinese version of the MAPS.

Convergent Validity

To test the convergent validity of the Chinese version of the MAPS, we investigated the linear regression of the two broadband parenting scales on child psychopathological outcomes (i.e., externalizing, internalizing and attentional problems; emotion regulation and negativity). As

shown in Table 8, broadband positive parenting, which was composed of Proactive Parenting, Positive Reinforcement, Warmth, and Supportiveness, was negatively associated with children's externalizing, internalizing, and attention problems. Positive parenting behaviors were also related to children's ability to regulate their emotions, in that higher scores of positive parenting were associated with higher levels of child emotional regulation and lower levels of emotional negativity. Conversely, broadband negative parenting, which was composed of Parental Hostility and Physical Control, was positively associated with children's externalizing, internalizing, and attention problems. Higher scores of negative parenting were also related to lower levels of child emotional regulation and higher levels of emotional negativity.

Discussion

To accurately assess parenting practices and relate parenting with child outcomes across cultures, the current study aimed to validate the Chinese version of the Multidimensional Assessment of Parenting Scale (MAPS; Parent & Forehand, 2017). Following the conduction of an exploratory factor analysis (EFA) and reliability tests, we assessed the internal consistency and test-retest reliability of the Chinese MAPS and its subscales. After considering Chinese cultural factors and consulting with the original author of the MAPS, the Lax Control subscale was removed from the final version. Confirmatory factor analyses and several validity tests were then conducted in sequence. The results indicate that the Chinese MAPS has good psychometric properties, presenting it as a promising and comprehensive tool for assessing parenting in Chinese-speaking populations.

First, after carefully examining both the original and Chinese versions of the MAPS, we found that the items under Lax Control were representative of parents' permissiveness or absence of control (e.g., item 23, *I feel that getting my child to obey is more trouble than it's*

worth), inconsistency with punitive behaviors (e.g., item 12, *I let my child out of a punishment early, like lift restrictions earlier than I originally said*), and tendency to give up on control attempts due to children's behaviors (e.g., item 20, *If my child gets upset when I say No, I back down and give in to her/him*). This phenomenon of loose or inconsistent control, however, might hold a different meaning (i.e., neglect rather than permissiveness) for Chinese families, in which parents are supposed to *guan* their children. *Guan* is highly regarded child-rearing behaviors in China, involving parental governance as well as the imbuelement of care and concern (Chen, Sun, & Yu, 2015). These culturally specific parenting behaviors were likely shaped by Confucianism given its emphasis on parental efforts to ensure children's obedience to norms and social interdependence, which, in turn, is thought to reinforce children to perform in culturally desirable ways (Liu & Guo, 2010). The items of Lax Control were contradictory of *Guan* behavior which may have impacted parents' perceptions of the items. That is to say, instead of referring to permissive or inconsistent behaviors as the items do for Western cultures, the Lax Control items may have been more suggestive of neglectful behaviors for Chinese families. Hence, it seemed that the Lax Control items had different meanings for Chinese parents (i.e., poor *Guan* behavior or neglect) as compared to Western parents (i.e., permissiveness). Therefore, after consulting with the original author and a group of Chinese experts on parenting, we decided to remove the Lax Control subscale from the Chinese MAPS. After confirming the good fitness of the remaining 28-item and six-subscale structure model, four subscales (i.e., Proactive Parenting, Positive Reinforcement, Warmth, and Supportiveness) were combined to represent Positive Parenting, and two subscales, Hostility and Physical Control, were combined to represent Negative Parenting.

Next, we examined the CFA and concurrent validity of the Chinese MAPS. After removing

the Lax Control subscale, the results of the CFA supported a multidimensional six-factor structure model, including the higher-order broadband positive and negative parenting scales. Further, strong measurement invariance was supported across child gender and child developmental stage and partial measurement invariance for parent gender. These results are encouraging and support the equivalent use of the MAPS for parenting practices of boys and girls and for parents of children and early adolescents. In contrast, only partial measurement invariance was supported for parent gender. Failure to find strong measurement invariance of scales is common (Vandenberg & Lance, 2000), and in most cases, full measurement invariance is not a necessary condition for comparisons across groups to be valid (Byrne, Shavelson, & Muthen, 1989). However, when comparing mean scores across Chinese mothers and fathers is the primary focus of future studies, caution is warranted, and future research should explore how cultural expectations about fatherhood or motherhood could influence mothers and fathers responding differently to parenting items.

Concurrent validity of the Chinese MAPS was tested using the IM-P and adapted PBI, given prior research highlighting how positive and negative parenting practices are strongly associated with mindful parenting (Bögels et al., 2014; Parent et al., 2015) as well as different parenting styles (Safford, Alloy, & Pieracci, 2007). In the current study, results showed that all correlations were significant. In particular, positive parenting was shown to be associated with mindful parenting, such that parents who utilized more positive parenting practices also reported engaging in higher levels of mindful parenting behaviors (e.g., being nonjudgmental, having high present-moment awareness, and being sensitive to children's needs). The reverse was found for negative parenting, with parents who reported utilizing more negative parenting practices also reporting fewer mindful parenting behaviors (e.g., difficulties listening to children with full attention, failing to be compassionate with either children or themselves). In addition, positive parenting was shown to

be positively related to the care subscale of the PBI, but negatively related to the overprotection subscale of the PBI, indicating that parents who scored high on positive parenting were also more likely to report greater caring behaviors and fewer controlling behaviors towards their children. In contrast, negative parenting was positively related to the overprotection subscale of the PBI, but was negatively related to the care subscale of the PBI. This finding is consistent with existing literature suggesting that parenting behaviors are related to parent-child bonding (Pinquart, 2017). As a result of these findings, we were able to confirm the concurrent validity of the Chinese MAPS.

In regard to convergent validity, since parenting practices are significantly related to children's emotional expressivity and psychopathological outcomes (Han, Qian, Gao, & Dong, 2015), the BPM-P (Achenbach et al. 2011) and ERC (Shields & Cicchetti, 1997) were utilized in the current study to test the measure's convergent validity. Results were also satisfactory for the convergent validity test. We found that broadband positive parenting was negatively associated with children's psychopathological symptoms (e.g., attentional, externalizing, and internalizing problems) and positively associated with their ability to regulate emotions. In contrast, broadband negative parenting demonstrated a negative effect on both children's psychopathological outcomes and emotion regulation. These results were consistent with previous studies conducted in Chinese and Western cultural contexts (Balan, Dobrea, Roman, & Balazsi, 2016; Li et al., 2018; Zhang et al., 2017), thus providing further support for positive parenting practices being important contributors to children's psychosocial development. On the contrary, negative parenting practices may impair children's behavioral and/or emotional development. Overall, these results verified the convergent validity of the Chinese MAPS, providing multidimensional indicators of parenting that can be used to evaluate how specific practices impact various psychopathological outcomes among children.

Despite our demonstration of the strong psychometric properties of the Chinese version of the MAPS, this study has several limitations. First, the current findings are based on samples from an urban area of China, which might not be generalizable to the overall Chinese population. Future research should consider testing this version with samples that are more representative of Chinese society. Second, all data were collected using self-report measures, and thus might be subject to the social desirability effect and other common methodological biases. Because of this, future studies should supplement the Chinese MAPS with observational parenting data or data from multiple informants to provide more comprehensive information. Third, the PBI was adapted to be a parental self-report measure for the purposes of the current study and should be further validated. Fourth, the lack of the detection of discriminant validity in the analysis approach may weaken the psychometric properties of the Chinese MAPS. Finally, the percentage of fathers who participated in the study was relatively low; therefore, the influence of parent gender should be considered when interpreting the findings of the current study. Notwithstanding its limitations, the current study has many strengths, including the large sample size and strong statistical methodology.

Importantly, this is the first translation and validation of the MAPS for Chinese-speaking parents of school-age children. Like the original MAPS, this 28-item scale has demonstrated good psychometric properties in terms of reliability and validity; therefore, it appears to be a promising instrument for measuring multidimensional parenting practices in this population. Use of the Chinese version of the MAPS will help facilitate multidimensional parenting research in China – an especially important goal given recently observed shifts in parenting behaviors and values. Findings from the Chinese MAPS may also assist in guiding recommendations for and the development of intervention programs for Chinese families. Moreover, this study may

promote future cross-cultural studies testing the effect of both positive and negative parenting on children's psychopathological adjustment.

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Table 1*Demographics of Participants (N = 2237)*

	Frequency	%
Relationship to child		
Mothers	1723	77.0
Fathers	514	23.0
Parental age		
<30	53	2.4
31-40	1531	71.3
41-50	549	25.6
>50	15	0.7
Education		
Master's degree or higher	239	10.7
Bachelor's degree or junior college	1022	45.7
High school diploma or equivalency	529	23.6
Middle school diploma	366	16.4
Primary school diploma	58	2.6
Did not graduate from primary school	23	1.0
Occupation		
Unemployed or laid off	427	19.1
Working part-time	306	13.7
Working full-time	1504	67.2
Child gender		
Female	1075	48.1
Male	1162	51.9
Child age		
6	67	3.0
7	361	16.1
8	354	15.8
9	345	15.4
10	420	18.8
11	328	14.7
12	362	16.2
Number of children		
1	1705	76.2
2	503	22.5
3 or more	29	1.3

Table 2*Summary of Goodness of Fit Statistics for EFA Contrasting Alternative Models of MAPS*

Model	χ^2	df	RMSEA	CFI	TLI	SRMR
Model 1						
1 Factor	7218.60***	527	.11	.51	.48	.12
Model 2						
2 Factors	3379.37***	494	.73	.79	.76	.06
Model 3						
3 Factors	2518.42***	462	.06	.85	.82	.04
Model 4						
4 Factors	1845.53***	431	.06	.90	.86	.03
Model 5						
5 Factors	1217.97***	401	.04	.94	.92	.03
Model 6						
6 Factors	862.05***	372	.04	.96	.95	.02
Model 7						
7 Factors	679.66***	344	.03	.98	.96	.02
Model 8						
6 Factors-final	484.81***	204	.04	.98	.96	.02

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 3*Factor loadings for MPAS items obtained from EFA (N = 1136)*

Item	EFA Standardized Loading						
	PP	PR	WM	SP	HS	LC	PC
Item15: Reasons for requests	.34	.08	.08	.28	.07	-.01	.02
Item19: Warn before activity change	.27	.12	-.02	.36	.14	-.06	-.06
Item28: Expectations before activity	.02	.46	-.02	.08	.06	.18	.11
Item32: Explain discipline	.68	-.03	.01	.04	-.03	-.01	-.01
Item33: Clear choices	.58	.05	-.01	.12	-.07	.05	-.05
Item34: Clear consequences	.49	.16	-.01	.05	.04	-.07	.06
Item11: Praise chore completion	.04	.30	.05	.45	-.03	-.04	.06
Item18: Praise listening	.01	.35	-.04	.46	.04	.00	-.04
Item26: Proud after task	.02	.56	.04	.24	-.03	.02	-.02
Item30: Praise for helping	.03	.58	.07	-.02	-.20	.02	.04
Item1: Express affection	.03	.00	.84	.01	.02	-.02	-.02
Item7: Warm and intimate times	-.03	.01	.49	.36	-.07	.02	.01
Item21: Hug and/or kiss	-.00	.05	.79	.03	.09	-.02	-.06
Item10: Show respect	.11	.07	.07	.57	-.20	.11	.05
Item17: Encourage communication	.22	.05	.09	.60	.01	.02	.04
Item22: Listen	.20	-.03	.19	.55	-.03	.04	-.07
Item4: Argue	.13	-.04	.16	-.1	.37	.02	.06
Item5: Threats	-.01	.07	.00	-.24	.36	.12	.17
Item6: Punishment based on mood	-.01	.06	.03	-.29	.31	.20	.25
Item8: Yell or shout	-.03	-.03	-.01	.00	.79	-.02	.00
Item13: Explode in anger	-.06	.00	-.01	-.01	.75	.02	.08
Item16: Lose temper	.06	-.08	-.02	.02	.65	.01	.12
Item29: Picky and on child's back	.09	.10	.05	-.03	.34	.17	.11
Item2: Gives in	-.10	-.01	.01	.12	.09	.47	-.14
Item3: Afraid to discipline	.02	.15	-.13	-.1	.10	.35	-.04
Item9: Talked out of punishments	.01	.11	.08	.03	-.12	.30	.09
Item12: End punishment early	.07	.04	.01	-.02	.04	.49	-.01
Item20: Back down and give in	-.02	-.13	-.07	.07	.00	.67	-.03
Item23: Not worth the trouble	.14	-.07	.03	-.09	.02	.31	.03
Item27: Give in to commotion	-.18	-.03	-.01	-.03	-.04	.53	.07
Item14: Spank with hand	-.18	-.02	.00	.03	.11	-.08	.76
Item24: Spank when angry	-.13	.01	-.04	.07	.09	-.01	.80
Item25: Physical punishment	.05	-.03	.01	-.15	-.10	.04	.71
Item31: Other ways haven't worked	.08	.00	-.05	-.14	.05	.01	.70

Note. PP = Proactive Parenting; PR= Positive Reinforcement; WM=Warmth; SP=Supportiveness; HS=Hostility; LC=Lax Control; PC=Physical Control.

Table 4*Internal Consistency Reliability Analyses for MAPS Subscales (N = 1136, N_I=423)*

Subscale	No. of items	McDonald ' s omega	Range of inter-item correlations	Mean inter-item correlation	Test-retest reliability
Proactive Parenting	5	.76	.32-.46	.38	.56
Positive Reinforcement	5	.75	.26-.47	.37	.58
Warmth	3	.83	.53-.70	.60	.73
Supportiveness	3	.81	.56-.61	.58	.59
Hostility	7	.83	.23-.64	.41	.66
Lax Control	7	.62	.10-.41	.20	.57
Physical Control	4	.87	.55-.73	.62	.71

Note. N_I was the sample for test-retest reliability.

Table 5*Summary of Goodness of Fit Statistics for CFA Testing Alternative Models of MAPS (N=1101)*

Model	χ^2	df	RMSEA	CFI	TLI	SRMR
Model 1	1247.55***	309	.05	.93	.92	.05
Model 1-R	1005.38***	306	.05	.94	.93	.05

Note. *** $p < 0.001$

Table 6*Factor Loadings for MPAS Items Obtained from CFA (N = 1101)*

Item	CFA Standardized Loading					
	PP	PR	WM	SP	HS	PC
Item15: Reasons for requests	.64***					
Item19: Warn before activity change	.66***					
Item32: Explain discipline	.61***					
Item33: Clear choices	.63***					
Item34: Clear consequences	.59***					
Item11: Praise chore completion		.69***				
Item18: Praise listening		.66***				
Item26: Proud after task		.66***				
Item28: Expectations before activity		.42***				
Item30: Praise for helping		.48***				
Item1: Express affection			.69***			
Item7: Warm and intimate times			.75***			
Item21: Hug and/or kiss			.69***			
Item10: Show respect				.72***		
Item17: Encourage communication				.74***		
Item22: Listen				.78***		
Item4: Argue					.37***	
Item5: Threats					.54***	
Item6: Punishment based on mood					.59***	
Item8: Yell or shout					.73***	
Item13: Explode in anger					.83***	
Item16: Lose temper					.75***	
Item29: Picky and on child's back					.58***	
Item14: Spank with hand						.84***
Item24: Spank when angry						.86***
Item25: Physical punishment						.74***
Item31: Other ways haven't worked						.78***

Note. PP = Proactive Parenting; PR= Positive Reinforcement; WM=Warmth; SP=Supportiveness; HS=Hostility; LC=Lax Control; PC=Physical Control. *** $p < 0.001$

Table 7*Pearson Correlation Coefficients between MAPS Factors, IM-P, and PBI (N=1101)*

	IM-P -t	IM-P1	IM-P2	IM-P3	IM-P4	IM-P5	PBI-ca	PBI-op
PosP	.65***	.42***	.57***	.41***	.63***	.47***	.58***	-.17***
NegP	-.56***	-.44***	-.30***	-.57**	-.44***	-.41***	-.35***	.09**
PP	.52***	.32***	.50***	.31***	.53***	.35***	.46**	-.13**
PR	.48***	.30***	.44***	.31***	.46***	.33***	.44***	-.15***
WM	.46***	.27***	.40***	.29***	.45***	.36***	.44***	-.11***
SP	.68***	.48***	.53***	.45***	.65***	.50***	.55***	-.17***
HS	-.57***	-.49***	-.27***	-.61***	-.41***	-.41***	-.34***	.09**
PC	-.46***	-.33***	-.26***	-.45***	-.38***	-.34***	-.30***	.08*

Note. PosP = Broadband Positive Parenting; NegP = Broadband Negative Parenting; PP = Proactive Parenting; PR = Positive Reinforcement; WM = Warmth; SP = Supportiveness; HS = Hostility; PC = Physical Control; IM-P-t = IM-P total; IM-P1 = Listening with Full Attention Subscale; IM-P2 = Emotional Awareness of Self and Child Subscale; IM-P3 = Self-Regulation in the Parenting Relationship Subscale; IM-P4 = Non-judgmental Acceptance of Self and Child; IM-P5 = Compassion for Self and Child. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 8*Multiple Regression Results for Each Broadband MAPS Factor as an Independent Variable (N=1101)*

	Externalizing	Internalizing	Attention	ERCR	ERCN
Cage	.00	.07*	.04	-.23***	-.03
Cgender	-.38**	-.22*	.13***	.42**	-.90**
Page	-.03*	-.03*	.02***	.05*	-.05
Pgender	-.05	-.02	.16	1.00***	-.36
BPP	-.76***	-.63***	-.69***	2.38***	-2.87***
BNP	1.52***	.95***	1.65***	-.47***	3.04***
R^2	.20	.11	.19	.18	.21
F	84.3	42.94	76.24	66.08	81.38

Note. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. Unstandardized regression coefficients. Cage = Child age; Cgender = Child gender; Page = Parent age; Pgender = Parent gender; BPP = Broadband positive parenting; BNP = Broadband negative parenting.