



Measurement invariance of the anxious protection subscale the short version of the multidimensional overprotective parenting scale (AP-s-MOPS) in Chinese and Belgian adolescents

Long Wang^{a,*}, Martijn Van Heel^a, Zahra Azadfar^a, Stijn Van Petegem^b, Lijun Wang^c, Ying Wang^d, Imke Baetens^a

^a Brussels University Consultation Center, Department of Psychology, Faculty of Psychology & Educational Sciences, Vrije Universiteit Brussel (VUB), Brussels, Belgium

^b Center for Research on Development, Family and Human Systems (Défasy), Université Libre de Bruxelles, Brussels, Belgium

^c Faculty of Educational Sciences, Anhui Normal University, Anhui, China

^d Wuhu NO. 2 Middle School, Anhui, China

ARTICLE INFO

Keywords:

Over-parenting
s-MOPS
Measurement invariance
Cross-cultural
Longitudinal
Adolescents

ABSTRACT

The *Anxious Protection* dimension of the Short Version of the Multidimensional Overprotective Parenting Scale (AP-s-MOPS) has been widely used to assess adolescent-perceived over-parenting, yet its measurement invariance has not been tested explicitly so far. In this light, the present cross-cultural longitudinal study first examined the AP-s-MOPS's original factor structure and then tested its invariance across countries (i.e., China and Belgium), across types of relationship (i.e., father-child and mother-child relationships) and across meso-timescales. We further investigated mean-level difference in over-parenting when scalar invariance was established. Using data from a three-wave longitudinal study (with three-month intervals) involving 809 adolescents: 73.7% Chinese ($N = 596$, $M_{\text{age}} = 15.05$, $SD = 1.27$, 48.2% boys) and 26.3% Belgian adolescents ($N = 213$, $M_{\text{age}} = 14.22$, $SD = 1.57$, 55.0% boys), the results of confirmatory factor analyses provided support for the one-factor structure of the AP-s-MOPS in Chinese and Belgian sample. We found that partial scalar invariance for the mother-child and father-child relationship across China and Belgium at the first time point, full scalar invariance at subsequent time points, and full scalar invariance across father-child and mother-child relationships at each time point. Furthermore, the AP-s-MOPS exhibited partial scalar invariance over time for the mother-child relationship in China, full metric invariance over time for the father-child relationship in China, and full scalar invariance over time for all two types of relationship in Belgium. Finally, mean-level difference test suggested that adolescents reported higher levels of maternal over-parenting compared to paternal over-parenting, while there was no evidence for significant mean-level differences between China and Belgium or across time. The present research supported the AP-s-MOPS as a reliable instrument for cross-cultural and meso-longitudinal research on over-parenting.

1. Introduction

Over-parenting refers to an excessive level of parental protection, taking into account children's developmental stage (Thomsgard et al., 1995). During adolescence, adolescents seek more independence and autonomy within the family realm (Van Petegem et al., 2013). This requires parents to readjust their level of involvement to adolescents' developing need for independence (Gutman & Eccles, 2007). Although, it might be difficult to let go for some parents, and respect the growth in

autonomy, potentially eliciting an excessive levels of involvement and protection which are not adapted to the adolescents' developmental needs (Venard et al., in press). Over-parenting can manifest itself in several ways during adolescence, such as solving problems on behalf of their children before they can try themselves (Segrin et al., 2012), pointing out all potential dangers to which one may be exposed (Brenning et al., 2017), or invading their privacy (Hawk et al., 2009). While over-parenting is often motivated by good intentions from parents to help adolescents overcome difficulties and challenges, the excessive

* Corresponding author at: Brussels University Consultation Center (BRUCC), Department of Psychology, Faculty of Psychology & Educational Sciences, Vrije Universiteit Brussel (VUB), Pleinlaan 2, 1050 Brussel, Belgium.

E-mail address: Long.Wang@vub.be (L. Wang).

<https://doi.org/10.1016/j.childyouth.2026.108776>

Received 10 September 2025; Received in revised form 2 December 2025; Accepted 12 January 2026

Available online 14 January 2026

0190-7409/© 2026 Elsevier Ltd. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

nature of it may have a negative impact on adolescent development, putting them at risk for anxiety and depressive symptoms (e.g., Van Petegem et al., 2020).

Researchers have developed several measurement tools to better examine these unique characteristics of over-parenting, such as Overparenting Scales developed by Segrin et al. (2012) and the Chinese paternal/maternal overparenting scale developed by (Leung & Shek, 2018). However, most of these measures were originally developed based on a sample of (emerging) adults, and these items are not fully applicable to adolescent populations. For instance, Segrin et al. (2012) included several finance-related items in the measurement of adult overparenting, such as “I see to it that my child’s financial needs are taken care of” and “I don’t want my child to have to worry about finances and how much his/her expenses cost”. However, Zong and Hawk (2022) demonstrated that both of these items exhibited poor validity in adolescent research.

In recent years, the short version of the Multidimensional Overprotective Parenting Scale (s-MOPS; Chevrier et al., 2023) was specifically designed to measure over-parenting among adolescents in a concise way. The s-MOPS is thus theoretically better suited to capture the features of adolescent over-parenting than comparable scales and has been applied within diverse cultural contexts in the existing literature (e.g., Skhirtladze & Van Petegem, 2024; Venard et al., 2024). Nevertheless, it remains unclear whether this measure is a valid measure to make comparisons across different groups (e.g., across different cultural groups). Measurement invariance assesses whether a measurement tool, such as a survey or questionnaire, functions equivalently across groups or measurement occasions. Researchers consistently agree that the measurement invariance is an essential prerequisite for making cross-group or within-group comparisons (e.g., Moehring et al., 2021). Unfortunately, no studies to date have focused on the measurement invariance of the s-MOPS, especially across different countries or time points, limiting its broader application. Therefore, this study is the first to explicitly evaluate the measurement invariance of the s-MOPS (particularly its *Anxious Protection* dimension, which is often the focus in the research on over-parenting) in an adolescent sample across two types of relationship (that is, father-child and mother-child), across 3-month intervals and across two distinct countries (i.e., China and Belgium). Additionally, we also assessed mean-level differences in overparenting across countries, across relationship types, and across time.

1.1. Multidimensional overprotective parenting scale

The Multidimensional Overprotective Parenting Scale (MOPS) consists of two higher-order dimensions of *Anxious Protection* (AP) and *Ego-enhancing Protection* (EP) (Kins & Soenens, 2013). AP refers to parents’ age-inappropriate overprotective behaviours toward their children due to their anxiety, and includes five subscales: Anxious parenting, Premature problem solving, Infantilization, Privacy invasion, and General overprotection (Chevrier et al., 2023). EP refers to the practice of excessively boosting children’s ego and overprotecting their self-esteem to avoid the negative effects of their failures. It consists of two subscales: Excessive praise and External attribution of failure. Chevrier et al. (2023) shortened the MOPS for large-scale surveys (e.g., longitudinal research) or research using intensive repeated assessments, resulting in a short version (s-MOPS) that includes both AP and EP. This was done by selecting items from each of the subscales through a series of factor analyses. In the current study, our focus is on the AP subscale of the s-MOPS version (AP-s-MOPS). This decision was based on the fact that prior research on over-parenting has focused predominantly on the AP-s-MOPS (e.g., Skhirtladze & Van Petegem, 2024), as this subscale most closely corresponds to the original conceptualisation of over-parenting proposed by Thomasgard et al. (1995). Additionally, past research documents that AP is unequivocally and positively associated with adolescents’ maladjustment, being consistently linked to more internalizing and externalizing difficulties (Eberly Lewis et al., 2024; Mathijs

et al., 2024; Van Petegem et al., 2022), whereas results for EP are more equivocal (Chevrier et al., 2023).

1.2. Measurement invariance of the AP-s-MOPS

Measurement invariance (MI) refers to “a property of a measurement instrument (in the case of survey research, a questionnaire), implying that the instrument measures the same concept in the same way across various subgroups of respondents” (Davidov et al., 2014, p. 58). Scholars often focus on two types of invariance: cross-group MI and within-group MI. Both examine the equality of a construct. However, the cross-group MI examines equality across subgroups (e.g., cultures or gender), while within-group MI, exemplified by longitudinal MI (LMI), examines equality within groups across varying conditions, such as over time (Leitgöb et al., 2023). Valid LMI implies that the same underlying constructs is measured consistently at different time points, which facilitates the reliable longitudinal comparisons of the scores of corresponding psychological variables. Similarly, the establishment of cross-group MI allows researchers to explicitly compare scores between groups.

Confirmatory factor analysis (CFA) is used to assess the LMI, whereas multiple-group CFA (MG-CFA) is employed to evaluate cross-group MI. These two analyses include a series of successive nested models in which the parameters are gradually constrained (Meredith, 1993). First, a configural invariance model is estimated to assess whether the measure has the same factorial structures across groups or time points. By establishing configural invariance, the fundamental structure of the constructs is supported in different groups or across time points. Second, the metric invariance model evaluates whether factor loadings are equivalent across groups or time points. If the model fit does not show a significant deterioration compared to the configural invariance model, it means that the contribution of each item to the latent construct remains consistent across groups or time points. Third, the scalar invariance model examines whether both factor loadings and intercepts are consistent across groups or time points. The establishment of scalar invariance is regarded as a crucial prerequisite for investigating latent mean differences across groups or across time. Finally, the residual invariance model examines whether the sum of specific variance and error variance remains consistent between groups or time points. According to Putnick and Bornstein (2016), the residual invariance test is not a prerequisite to test latent mean differences, leading many researchers to omit this step. Therefore, we only examined the first three models of invariance in the current study, as with most previous studies (e.g., Jovanović et al., 2022). When full invariance is not met at metric or scalar level, researchers can assess partial invariance (i.e., removing restrictions on one or more factor loadings, intercepts, or both).

Notably, prior research has examined the s-MOPS’s invariance across types of relationships (i.e., father-child vs. mother-child). Theoretically, over-parenting may differ between mothers and fathers. Historical developmental psychology and earlier theory (e.g., attachment theory) that emphasized on mothers may reinforce the ideology of intensive mothering, which posits mothers are primarily responsible for child-rearing (Venard et al., 2024). Under this ideology, mothers are expected to demonstrate devotion through high involvement in children’s daily lives, sometimes at the expense of their careers (Faircloth, 2020). Although fathers’ involvement is increasing nowadays (Schoppe-Sullivan & Fagan, 2020), mothers are still regarded as the primary caregivers (Meeussen et al., 2022). Consequently, mothers may experience greater pressure than fathers in fulfilling their parental roles (Meeussen & Van Laar, 2018), potentially leading them to show more over-parenting than fathers (Venard et al., 2024).

Against this theoretical backdrop, Chevrier et al. (2023) used an adolescent sample to investigate whether the s-MOPS functions equivalently when measuring over-parenting behaviours of mothers and fathers (Chevrier et al., 2023). Their results indicated that mean levels of over-parenting can be meaningfully compared across mothers and

fathers using the s-MOPS. However, [Chevrier et al. \(2023\)](#) did not specifically focus on the *Anxious Protection* dimension. Importantly, their findings could not be generalized to other cultural contexts. Because, despite evidence that the AP-s-MOPS exhibits good psychometric properties in various cultural settings, such as Belgium ([Lamprianidou et al., 2025](#)), Switzerland ([Venard et al., 2024](#)), Australia ([Ryan et al., 2024](#)) and Georgia ([Skhirtladze & Van Petegem, 2024](#)), there is no research explicitly testing its measurement invariance across countries.

Herein, we focused on two very different cultural contexts: Belgium, an individualistic society valuing independence and self-expression, and China, a collectivistic society emphasizing interdependence and familism. It is argued that cultural values linked to individualism or collectivism may influence parenting beliefs and behaviours ([Costigan & Su, 2008](#); [Lansford et al., 2021](#)). For example, Chinese culture, rooted in collectivism, places strong value on maintaining social harmony and positive reputation within the community ([Shek, 2006](#)). As a result, Chinese parents may engage more often in overprotective behaviours, such as discouraging risk-taking or emotional expression, to avoid disruption of group cohesion. Additionally, child-focused and intensive parenting has traditionally been a cultural norm in China ([Hong & Cui, 2023](#)), potentially further leading to higher levels of over-parenting due to “much love” ([Martin & LeLoup, 2020](#)). In contrast, individualistic cultures such as Belgium prioritize independence, autonomous decision-making, and self-expression in parenting ([Shek, 2006](#)). As a consequence, Belgian parents might engage less often in overprotective behaviours. However, cultural differences in parenting beliefs or perceived norms may lead to a lack of measurement invariance across cultural groups ([Rodriguez et al., 2023](#)), which can undermine the validity of cross-cultural comparisons of parenting behaviours (e.g., [Xiong et al., 2022](#); [Zhao et al., 2023](#)). As a result, it is essential to examine whether the same AP-s-MOPS items can be interpreted equivalently across Chinese and Belgian cultural contexts using a measurement invariance approach to ensure valid cross-cultural comparisons of over-parenting.

Additionally, measurement invariance across time of the AP-s-MOPS has not yet been addressed either. Parenting processes, including over-parenting, can manifest across a micro timescale (i.e., measurement intervals of seconds to days), a meso timescale (i.e., interval between weeks to months) and a macro timescale (i.e., 6-month interval or longer) ([Boele et al., 2020](#)). Existing parenting research has mainly focused on either micro-timescales or macro-timescales, while largely overlooking the meso-timescale ([Boele et al., 2020](#)). In the absence of clear theoretical guidance on optimal measurement intervals, [Bülow et al. \(2025\)](#) recommend prioritizing shorter intervals (e.g., weeks or months) over longer ones. This strategy facilitates more precise confirmation of the timescale of parenting processes, so that theoretical considerations can guide measurement intervals for future longitudinal studies ([Bülow et al., 2025](#); [Hopwood et al., 2022](#)). To our knowledge, only two studies have examined longitudinal associations between helicopter parenting and adolescents’ developmental outcomes at meso-timescales ([Wang et al., 2025](#); [Wang et al., 2023](#)). Although helicopter parenting and over-parenting are often used interchangeably in some literature, they are not fully equivalent (see [Ryan et al., 2024](#) for elaborate discussion). Thus, it is essential to examine longitudinal measurement invariance at a meso-timescale to ensure that AP-s-MOPS items are consistently measuring the same underlying construct over time. Importantly, such an examination will provide a solid foundation for future meso-longitudinal studies on over-parenting using the AP-s-MOPS, thereby further deepening our fully understanding of the timescale of the over-parenting process and enabling more precise confirmation of its timescale.

Furthermore, a growing body of research has examined mean-level differences in over-parenting across various situations. For instance, [Hong and Cui \(2023\)](#) found similar mean levels of over-parenting among emerging adults in China and the United States, but did not directly compare the latent means. Additionally, adolescents reported higher levels of maternal over-parenting than paternal over-parenting ([Venard](#)

[et al., 2024](#)). Finally, both maternal and paternal over-parenting, as perceived by early Chinese adolescents, declined over a 2-year period (e.g., [Leung & Shek, 2024](#)). Although these findings were meaningful, nearly all of these studies relied on measures other than the AP-s-MOPS, and some studies did not focus on adolescent samples. This limitation hinders our understanding of mean-level differences in adolescent over-parenting—as assessed by the AP-s-MOPS—across countries, relationship types, and time. Accordingly, it is needed to utilize the AP-s-MOPS to replicate and extend these findings in an adolescent sample, contingent upon establishing scalar invariance.

1.3. The present study

In summary, the invariance of AP-s-MOPS across relationship types, cultural contexts, and time remains largely underexplored, potentially limiting the generalizability of research findings derived from its use. The current investigation aimed to examine the factor structure and MI of the AP-s-MOPS in an exploratory manner. Specifically, the first aim was to evaluate whether the one-factor model of the AP-s-MOPS showed acceptable fit in each subsample (**Research question 1**). Additionally, we aimed to assess whether the AP-s-MOPS exhibited invariance across countries (**Research question 2**). Thereby, we focused on China, which is typically considered a collectivistic cultural context, and Belgium, typically considered an individualistic cultural context ([Hoftede et al., 2010](#)). Further, it is also important to assess the invariance of the AP-s-MOPS across different types of relationship (i.e., father-child vs. mother-child) (**Research question 3**). Indeed, past research often documented mean-level differences between mothers and fathers in over-parenting, as mothers perceived more pressure to be highly involved in their children’s upbringing (e.g., [Venard et al., 2024](#)). Thirdly, establishing longitudinal invariance is essential for studying how over-parenting evolves across time and development. Therefore, our third aim was to examine whether the AP-s-MOPS was invariant over a three-month interval (**Research question 4**), providing a foundation for meso-longitudinal research on over-parenting. Finally, whenever scalar invariance was obtained, we investigated differences in mean levels of over-parenting across countries, relationship types and time (**Research question 5**).

2. Methodology

2.1. Participants

Chinese and Belgian adolescents were recruited from two high schools in China and Belgium, respectively. Three waves of surveys were conducted in each country, with a three-month interval between each wave. A total of 809 students participated in the first wave (data collected in March 2023), including 596 Chinese ($M_{\text{age}} = 15.05$, $SD = 1.27$, 48.2% boys) and 213 Belgian adolescents ($M_{\text{age}} = 14.22$, $SD = 1.57$, 55.0% boys). Of the initial participants, 649 adolescents took part in the second wave in June 2023, including 484 Chinese and 165 Belgian adolescents. The third wave was held in September 2023, including 542 Chinese and 117 Belgian adolescents. The overall attrition rate is 9.06% for Chinese sample, and 45.07% for Belgian sample. In terms of the educational level of the adolescents’ parents, more than 40% of the Chinese adolescents reported that their mother or father had junior high school degree or higher, whereas the same percentage of Belgian adolescents reported that their mother or father had a bachelor’s degree or higher. Additionally, 65.1% of the Belgian adolescents were satisfied with family’s financial condition, while a similar percentage (67.6%) of Chinese teenagers were neither satisfied nor dissatisfied with their family’s financial condition. Furthermore, 91.1% of Chinese adolescents lived with their original families, compared to 73.1% of Belgian adolescents. Finally, we compared the demographic characteristics of the Chinese and Belgian samples, revealing significant differences in all characteristics except adolescent gender (see Table S1 for details).

All subsample sizes at each time point for Chinese and Belgian sample align with the general guideline for conducting CFA and SEM, which recommends maintaining a minimum ratio of 10:1 between the number of cases and the estimated parameters (Kline, 2016).

2.2. Procedures

Chinese adolescents completed a set of hardcopy questionnaires during a self-study class. Belgian adolescents at one school completed the same questionnaires during a designated survey period, while those at another school filled them out online in the classroom. Online questionnaires were disseminated via Qualtrics platform with the support from Belgian research assistants. Also, the paper questionnaires were delivered by well-trained research assistants, including master students in psychology in Belgium and mental health teachers in China. All participants and their parents reviewed and signed the informed consent forms prior to data collection. Participants were informed of their rights and were free to withdraw from the survey at any point. Data collection occurred every three months in China and Belgium, resulting in three waves per country. This study was approved by the Medical Ethics Committee of UZ Brussel/VUB (BUN: 1432022000230) and the Ethics Committee of Shaanxi Normal University.

2.3. Measurement

Demographic information. Participants were asked to provide information on their age, gender, parental education levels, family status and family financial situation (Sanders & Morawska, 2010).

Over-parenting. We assessed over-parenting using the Anxious Protection of the s-MOPS, developed by Chevrier et al. (2023). This subscale includes 10 items (e.g., “My mother/father is too protective”). Participants rated each item ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating a higher level of over-parenting. Notably, items were filled out separately for mothers and fathers. Moreover, the over-parenting scores of mothers and fathers were averaged to create a combined measure of parental over-parenting to examine the invariance of such a combined mother/father over-parenting measure as well. Table 1 presents the Cronbach's alphas of the AP-s-MOPS for each type of relationship in China and Belgium and across the three survey waves.

For the translation process, the original English version of the AP-s-MOPS was first translated into Chinese by a Chinese researcher fluent in

English. Subsequently, a bilingual teacher proficient in both English and Chinese performed a back-translation. Next, a PhD student in psychology whose native language was English compared the original English version with the back-translated version of the AP-s-MOPS. Finally, these three individuals discussed the discrepancies together and created the final Chinese version. A validated Dutch version of the AP-s-MOPS was already available (Chevrier et al., 2023).

2.4. Analytical strategy

First, a series of CFAs were conducted on the AP-s-MOPS in Mplus 8.10 before examining measurement invariance. Each type of relationship (i.e., father-child and mother-child relationships) of the AP-s-MOPS was evaluated simultaneously for each country group (i.e., Belgium and China) at each time point (i.e., three waves of measurement), resulting in a total of ($2 \times 2 \times 3 =$) 12 CFA analyses. In the case of inadequate fit, we improved the model fit through minor modifications using the modification indices, such as adding error covariances between a limited number of items. Following this, we performed MI and LMI analyses including configural, metric, and scalar invariance tests. Additionally, when full invariance at metric or scalar level was not satisfactory, we examined a partial metric or scalar invariance model by gradually removing the constraints on the item loadings or intercepts. Subsequently, we further compared a partially invariant model, which imposes constraints only on invariant items, to a fully invariant model, which applies constraints to both invariant and noninvariant items, to evaluate whether the results of interest, such as latent mean differences, remain similar between the two models. Similar results would indicate that items varying across groups or time have little impact on the results (Putnick & Bornstein, 2016).

To examine the MI of the AP-s-MOPS across countries (i.e., China and Belgium) and relationship types (i.e., father-child and mother-child relationships), a series of multi-group CFAs (MG-CFA) were employed in Mplus 8.10. Measurement invariance was assessed by examining whether factor structure (configural invariance), factor loadings of items (metric invariance) and intercept loadings (scalar invariance) were equivalent across groups at each time point. Cross-country and cross-relationship invariance tests were examined through two interconnected steps: MI was first evaluated across countries (China vs. Belgium) and then across relationship types (father-child vs. mother-child) (Tagliabue et al., 2021). This relatively strict approach was adopted because assessing measurement invariance across relationship

Table 1
Model fits indices and cronbach's alphas of the AP-s-MOPS for separate sample.

Time Point	Country	Types of relationship	χ^2	df	RMSEA	RMSEA(90%CI)	CFI	SRMR	Cronbach's alphas
T1	China	father-child	115.134	35	0.062	0.050–0.075	0.907	0.047	0.798
		mother-child	138.541	35	0.071	0.059–0.083	0.897	0.054	0.813
		mother-child (with error covariance) ^a	130.188	32	0.072	0.059–0.085	0.903	0.052	
	Belgium	father-child	25.395	35	0.000	0.000–0.025	1.000	0.033	0.825
		mother-child	53.458	35	0.050	0.019–0.076	0.949	0.034	0.820
T2	China	father-child	139.776	35	0.079	0.066–0.093	0.899	0.049	0.873
		father-child (with error covariance) ^b	104.946	32	0.069	0.055–0.084	0.929	0.042	
		mother-child	141.370	35	0.079	0.066–0.093	0.899	0.053	0.885
		mother-child (with error covariance) ^c	100.964	32	0.067	0.052–0.082	0.935	0.045	
	Belgium	father-child	43.704	35	0.039	0.000–0.073	0.974	0.045	0.850
		mother-child	54.404	35	0.058	0.024–0.087	0.951	0.047	0.867
T3	China	father-child	130.304	35	0.068	0.055–0.080	0.908	0.050	0.889
		mother-child	142.467	35	0.075	0.063–0.089	0.903	0.052	0.886
	Belgium	father-child	44.072	35	0.035	0.000–0.064	0.977	0.041	0.854
		mother-child	57.665	35	0.075	0.037–0.108	0.926	0.058	0.872

Note. ^a, ^b, and ^c adding three pairs of error covariance: between items 3 and 7, between items 9 and 11 and between items 31 and 35; bold words represent those that do not meet the evaluation criteria.

types (i.e., father-child and mother-child relationships) without first verifying cross-country invariance for the same type of relationship may risk introducing bias. For example, if cross-country invariance is not verified for maternal or paternal over-parenting, country differences may interact with variations in relationship types, thereby affecting the interpretation for the results of MI test across relationship types. Therefore, when cross-country comparisons were conducted, it was important to first verify whether an equivalent measurement model for the same type of relationship (i.e., maternal or paternal over-parenting) holds across countries. In the second step, we also verified measurement invariance across relationships. This yielded ($2 \times 3 =$) six MI analyses. In terms of the LMI of the AP-s-MOPS, CFA was used to examine whether the AP-s-MOPS was consistent across time for same type of relationship (i.e., father-child and mother-child relationships) within each country (i.e., China and Belgium). This resulted in a total of ($2 \times 2 =$) four LMI analyses.

Additionally, considering that some researchers focus primarily on parental over-parenting in general rather than maternal or paternal over-parenting per se, we performed supplementary analyses to assess the equivalence of the AP-s-MOPS combining mother and father scores into an overall over-parenting score. The equivalence of such a use of the AP-s-MOPS was then also examined across countries (China and Belgium) at three time points, as well as its longitudinal invariance within each country. This resulted in three MI analyses and two LMI analyses. Prior to conducting the MI and LMI analyses, we also performed CFA for each country group (China and Belgium) at each of the three time points, yielding a total of six (2×3) CFA analyses.

The Robust Maximum Likelihood (MLR) estimator was used in all CFAs and MG-CFAs. In the factor analysis, the cut-off criterion for factor loading was set at 0.30 or higher (Brown, 2006; Guo et al., 2021). The model fit of the CFA/MG-CFA was assessed using the comparative fit index (CFI), the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA). A CFI greater than 0.90 (Hu & Bentler, 1999), an SRMR less than 0.08 (Browne & Draper, 2006) along with a RMSEA below 0.10 (MacCallum et al., 1996) indicate an acceptable model fit. A CFI value exceeding 0.95, an SRMR below 0.05, and a RMSEA below 0.05 indicate a good model fit (Yaşhoğlu & Yaşhoğlu, 2020). However, Kenny (2025) noted that if the RMSEA value of the null model is below 0.158, the CFI should not be considered. Accordingly, such incremental indices were considered only for cases in which the RMSEA of the null model was lower than 0.158. Cross-group and longitudinal invariance of the AP-s-MOPS were assessed by comparing the difference in CFI (ΔCFI), SRMR ($\Delta SRMR$) and RMSEA ($\Delta RMSEA$) between a series of nested model, including configural invariance, metric invariance and scalar invariance models. According to Chen (2007), the cut off points for testing metric invariance was $\Delta CFI \leq .01$, along with $\Delta RMSEA \leq .015$ or $\Delta SRMR \leq .03$. In terms of testing scalar invariance, $\Delta CFI \leq .01$, along with $\Delta RMSEA \leq .015$ or $\Delta SRMR \leq .01$ were regarded as the cut-off of criteria (Chen, 2007).

Mplus syntax is available in the following link: <https://osf.io/xvkds/>. This study was not preregistered.

2.5. Missing data

A series of attrition analyses were conducted to investigate whether there are differences in participants who participated at all waves versus those who only participated at the first wave of data collection. The results indicated that there were no significant differences within the Chinese and Belgian samples, respectively, in term of age [$t = 0.137$, $p = 0.891$, for China; $t = -0.948$, $p = 0.344$, for Belgium], mother's education level [$\chi^2(5) = 6.291$, $p = 0.279$, Cramer's $V = 0.104$; $\chi^2(5) = 3.675$, $p = 0.597$, Cramer's $V = 0.136$], father's education level [$\chi^2(5) = 12.884$, $p = 0.024$, Cramer's $V = 0.148$; $\chi^2(5) = 6.262$, $p = 0.282$, Cramer's $V = 0.178$], family status [$\chi^2(3) = 5.825$, $p = 0.120$, Cramer's $V = 0.099$; $\chi^2(3) = 1.918$, $p = 0.590$, Cramer's $V = 0.095$] or family financial situation [$\chi^2(4) = 7.514$, $p = 0.111$, Cramer's $V = 0.113$; $\chi^2(4)$

$= 3.346$, $p = 0.502$, Cramer's $V = 0.126$]. However, adolescent gender and over-parenting showed significant differences in the Chinese sample [$\chi^2(1) = 21.249$, $p < 0.001$, Cramer's $V = 0.189$; $t = 2.309$, $p = 0.022$, Cohen's $d = 0.23$] but not in the Belgian sample [$\chi^2(1) = 1.230$, $p = 0.267$, Cramer's $V = 0.069$; $t = 1.189$, $p = 0.236$]. The Chinese participants who dropped out reported higher level of over-parenting and included more boys, but the effects were relatively small. Further, although Little's missing completely at random test (Little, 1988) indicated that the missing data of the Chinese sample are not random, $\chi^2(4741) = 6016.61$, $p < 0.001$, a normed χ^2 (χ^2/df) of 1.27 suggested that missing data could be handled reliably (Bollen, 1989). Subsequently, to address missing data, the full information maximum likelihood (FIML) approach was employed, utilizing all available data (including those from participants with incomplete responses) to estimate the model parameters (Muthén & Muthén, 1998-2017).

3. Results

3.1. Descriptive analysis

Table S2 showed that in the Chinese sample, gender and age were negatively and significantly associated with over-parenting at all time points, except for a nonsignificant association between gender and over-parenting at T2. Other demographic variables—mother's and father's education level, family status, and family financial situation—were unrelated to over-parenting at all time points. In the Belgian sample, demographic variables were not associated with over-parenting, except for a positive association between mother's education level and over-parenting at T1. Additionally, over-parenting's skewness and kurtosis were within an acceptable range (skewness $< |3.00|$, kurtosis $< |10.00|$; Kline, 2016) (see Table S3).

3.2. Factor structure of the AP-s-MOPS

As shown in Table 1, the one-factor model demonstrated an acceptable or a good fit for the father-child and mother-child relationships in the Belgian sample at each time point. For the Chinese sample, the model for the father-child relationship showed an acceptable fit at T1 and T3, and a fit that was close to acceptable at T2. The model fit for the mother-child relationship was considered acceptable at T3, and it was close to acceptable at T1 and T2. Concerning all models with unsatisfied fit, following the recommendation by Kline (2016), we found that their fit improved and became acceptable after adding the error covariances between items (see Appendix A1 for more information). Therefore, we added these error covariances for all subsamples in further analyses of measurement invariance. Table S4 showed that CFA model fit data well in all subsamples after adding these error covariances.

In addition, we found that two items' factor loadings were below the cut-off criteria in the Chinese sample (see Table 2). Specifically, the factor loading of item 7 "My mother/father is too protective" was found to be below 0.30 for all types of relationship at T1, and for the father-child relationship at T3. Similarly, the factor loading of item 15 "My mother/father immediately sees danger whenever I want to do something new" was also < 0.30 when involving the father-child relationship at T1 and T2. Despite the factor loadings of items 7 and 15 sometimes falling below the 0.30 cut-off in the Chinese samples, we retained these items for further MI analysis, considering the overall acceptable fit of all models and in order to maintain consistency with previous research. All items are presented in Table S5 (Dutch version) and Table S6 (Chinese version).

3.3. MI of the AP-s-MOPS across countries and types of relationship

MI tests across countries and relationships at each time point were not conducted separately; instead, they were incorporated into a multi-

Table 2

Factor loadings of the AP-s-MOPS for separate sample.

Time Point	Country	Types of relationship	Item3	Item7	Item9	Item11	Item15	Item16	Item29	Item31	Item32	Item35	
T1	China	Father-child	0.368	0.256	0.623	0.685	0.271	0.719	0.624	0.477	0.734	0.466	
		Mother-child	0.400	0.266	0.626	0.686	0.321	0.764	0.668	0.430	0.767	0.436	
		Mother-child (with error covariance) ^a	0.393	0.251	0.630	0.694	0.316	0.769	0.663	0.418	0.771	0.424	
	Belgium	Father-child	0.553	0.451	0.595	0.434	0.622	0.696	0.623	0.522	0.608	0.633	
		Mother-child	0.493	0.497	0.594	0.467	0.606	0.688	0.527	0.478	0.659	0.573	
	T2	China	Father-child	0.540	0.451	0.789	0.742	0.288	0.682	0.683	0.698	0.800	0.705
Father-child (with error covariance) ^b			0.531	0.444	0.771	0.731	0.293	0.688	0.697	0.674	0.809	0.683	
Mother-child			0.505	0.425	0.770	0.771	0.301	0.743	0.737	0.643	0.811	0.654	
Mother-child (with error covariance) ^c			0.491	0.409	0.756	0.771	0.300	0.754	0.747	0.613	0.819	0.623	
Belgium		Father-child	0.465	0.453	0.596	0.643	0.553	0.754	0.588	0.632	0.706	0.743	
		Mother-child	0.545	0.509	0.673	0.559	0.624	0.730	0.626	0.595	0.710	0.742	
T3		China	Father-child	0.387	0.266	0.639	0.704	0.312	0.769	0.659	0.449	0.769	0.462
			Mother-child	0.554	0.544	0.701	0.658	0.505	0.740	0.764	0.694	0.789	0.687
	Belgium	Father-child	0.507	0.452	0.637	0.429	0.652	0.744	0.629	0.502	0.633	0.615	
		Mother-child	0.585	0.630	0.625	0.639	0.624	0.762	0.646	0.660	0.537	0.664	

Note. ^a all a, b, and ^c adding three pairs of error covariances: between items 3 and 7, between items 9 and 11 and between items 31 and 35; bold words represent those that do not meet the evaluation criteria.

group model and performed in a stepwise manner (Tagliabue et al., 2021). As presented in Table 3, the configural model showed good model fit at each time point. We subsequently tested metric and scalar invariance across countries for the two factors (mother-child and father-child relationships). Results indicated items of both factors had equivalent factor loadings across countries at all time points (i.e., full metric invariance). However, full scalar invariance was achieved only at T2 and T3 (see Table 3). At T1, item 15 “My mother/father immediately sees danger whenever I want to do” showed a significant difference between the Chinese and Belgian samples at Time 1. As a result, we released the intercept constraint for item 15 across two countries to achieve partial scalar invariance. For the partially invariant model, we compared it with the corresponding full invariance model in terms of the latent mean difference in over-parenting, following Putnick and Bornstein (2016). The results indicated that the difference was very similar (e.g., China as

reference group; partially scalar invariant model: Mean = -0.067 , $p = 0.468$, for the mother-child relationship; Mean = -0.128 , $p = 0.161$, for the father-child relationship; whereas for the fully scalar invariant model: Mean = -0.067 , $p = 0.470$, for the mother-child relationship; Mean = -0.151 , $p = 0.106$, for the father-child relationship), suggesting that releasing the intercept constraint of item 15 across countries had a minimal impact on the overall results. Consequently, we can conclude that latent mean difference for each factor can be compared across countries at all time points. Subsequently, we tested MI across mother-child and father-child relationships, while maintaining the constraints for invariance across countries, finding full scalar invariance at all three time points (see Table 3).

Table 3

The results of testing measurement invariance across countries and types of relationship.

Time Points	Type of the invariance	RMSEA	ΔRMSEA	CFI	ΔCFI	SRMR	ΔSRMR
T1	Configural	0.042		0.963		0.057	
	Invariance across countries						
	Metric	0.047	0.005	0.952	−0.009	0.068	0.011
	Scalar	0.051	0.004	0.939	−0.013	0.075	0.007
	Partial Scalar ^a	0.050	0.003	0.942	−0.010	0.074	0.006
	Invariance across types of relationship						
	Metric	0.050	0.000	0.941	−0.001	0.076	0.002
	Scalar	0.052	0.002	0.935	−0.006	0.076	0.000
T2	Configural	0.049		0.952		0.058	
	Invariance across countries						
	Metric	0.052	0.003	0.943	−0.009	0.067	0.009
	Scalar	0.054	0.002	0.935	−0.008	0.070	0.003
	Invariance across types of relationship						
	Metric	0.053	−0.001	0.935	0.000	0.071	0.001
	Scalar	0.054	0.001	0.932	−0.003	0.071	0.000
T3	Configural	0.058		0.934		0.066	
	Invariance across countries						
	Metric	0.058	0.000	0.929	−0.005	0.069	0.003
	Scalar	0.058	0.000	0.923	−0.006	0.073	0.004
	Invariance across types of relationship						
	Metric	0.058	0.000	0.923	0.000	0.075	0.002
	Scalar	0.058	0.000	0.920	−0.003	0.075	0.000

Note. ^a removing the intercept constraint across countries of item 15; we added the error covariances between items 3 and 7, items 9 and 11 and items 31 and 35 in all models.

3.4. MI of the AP-s-MOPS across time in each country and each type of relationship

The longitudinal invariance analysis of the AP-s-MOPS was conducted in each country and for father-child and mother-child relationships. The results indicated that full scalar invariance was established for the Belgian father-child relationship (see Table 4). Additionally, we found that partial scalar invariance held in the Chinese mother-child relationship. Specifically, in testing scalar invariance for this relationship, imposing constraints on the intercept of item 31 “My mother/father gives the impression that she/he doesn’t want me to grow up” across time resulted in a reduced and unacceptable model fit. Hence, these constraints were released, yielding an acceptable model fit and demonstrating partial scalar invariance across time for the Chinese mother-child relationship. We further compared the partial invariance model with the corresponding full invariance model in terms of the difference in latent mean for over-parenting. The results indicated that the differences between the two models were generally similar: T1 as reference group; for the partially scalar invariant model of the mother-child relationship, Mean = 0.035, $p = 0.431$, at T2, and Mean = 0.092, $p = 0.049$, at T3, while for the corresponding fully scalar invariant model, Mean = 0.060, $p = 0.173$, at T2, and Mean = 0.117, $p = 0.012$, at T3. Thus, overall, releasing the constraints on item 31 had little effect on the invariance across time for the mother-child relationship in the Chinese sample.

In terms of the LMI for the Belgian mother-child relationship, we found that the configural invariance model had an unacceptable fit to data, based on a CFI value of 0.883. However, the RMSEA value for the corresponding null model is 0.121 (i.e., <0.158), suggesting that the CFI should not be considered (Kenny, 2025). Thus, we used the (Δ) RMSEA and (Δ) SRMR values as the evaluation criteria for subsequent models. Finally, we found full configural, metric and scalar invariance across time for this relationship.

Finally, although the fit of configural and metric invariance models were acceptable for the Chinese father-child relationship, the model demonstrated an unsatisfactory fit when testing scalar invariance over time according to all evaluation criteria. We then performed the partial scalar invariance test, which suggested the partial scalar invariance could not be established, even after removing the cross-time constraints on the intercepts of the five items, including items 6, 11, 7, 32 and 9. According to Vandenberg and Lance (2000), a factor can be considered partially invariant when the majority of its items exhibit invariance. However, our findings revealed that half of the items exhibited non-invariance at the scalar level, preventing comparisons of latent mean difference in over-parenting for Chinese father-child relationship across time.

3.5. Latent mean differences in over-parenting

The establishment of scalar invariance allows for the comparison of

latent means, potentially providing a further understanding of difference and change in over-parenting across countries, type of relationship, and across time. The results (see Table 5) revealed that mothers’ and fathers’ over-parenting levels were not significantly different across countries (i.e., China and Belgium) and across time, with the exception that Belgian adolescents reported higher over-parenting at T3 compared to Chinese adolescents (as the reference group; Mean = -0.267 , $p = 0.024$). Additionally, adolescents reported higher mothers’ over-parenting (as the reference group) compared to fathers’ over-parenting at all three time points (Mean = -0.215 , $p < 0.001$, at T1; Mean = -0.192 , $p = 0.003$, at T2; Mean = -0.274 , $p = 0.004$, at T3).

3.6. Supplementary analyses

We further conducted supplementary analyses to assess whether the overall over-parenting (i.e., combining maternal and paternal over-parenting) as measured by the AP-s-MOPS, exhibited measurement equivalence across countries at each time point and across time within

Table 5

The latent mean difference in over-parenting for the mother-child and father-child relationships.

Invariance across countries	Mother-child relationship (China as reference group)	Father-child relationship (China as reference group)	
Time 1	Mean = -0.067 , $p = 0.468$	Mean = -0.128 , $p = 0.161$	
Time 2	Mean = 0.014 , $p = 0.882$	Mean = -0.089 , $p = 0.367$	
Time 3	Mean = -0.108 , $p = 0.340$	Mean = -0.267 , $p = 0.024$	
Invariance across types of relationship (China and mother-child relationship as reference group)			
Time 1	Mean = -0.215 , $p = 0.000$		
Time 2	Mean = -0.192 , $p = 0.003$		
Time 3	Mean = -0.274 , $p = 0.004$		
Invariance across time	Chinese mother-child relationship	Belgian father-child relationship	Belgian mother-child relationship
Time 1 (as reference group)			
Time 2	Mean = 0.035 , $p = 0.431$	Mean = 0.030 , $p = 0.689$	Mean = 0.056 , $p = 0.180$
Time 3	Mean = 0.084 , $p = 0.073$	Mean = 0.016 , $p = 0.848$	Mean = 0.042 , $p = 0.412$

Note: We added the error covariances between items 3 and 7, items 9 and 11 and items 31 and 35 in all models.

Table 4

The results of testing measurement invariance across time in each country and each type of relationship.

Types of relationship	Type of the invariance	Chinese sample						Belgian sample					
		RMSEA	Δ RMSEA	CFI	Δ CFI	SRMR	Δ SRMR	RMSEA	Δ RMSEA	CFI	Δ CFI	SRMR	Δ SRMR
Father-child relationship	Configural	0.040		0.925		0.050		0.027		0.950		0.068	
	Metric	0.042	0.002	0.915	-0.010	0.061	0.011	0.026	-0.001	0.950	0.000	0.073	0.005
	Scalar	0.063	0.021	0.799	-0.116	0.148	0.087	0.025	-0.001	0.951	0.001	0.074	0.001
	Partial Scalar ^a	0.045	0.003	0.899	-0.016	0.076	0.015						
Mother-child relationship	Configural	0.041		0.925		0.055		0.044		0.886		0.074	
	Metric	0.042	0.001	0.915	-0.010	0.063	-0.008	0.043	-0.001	0.886	0.000	0.080	0.006
	Scalar	0.044	0.002	0.903	-0.012	0.063	0.000	0.042	-0.001	0.889	0.003	0.080	0.000
	Partial Scalar ^b	0.043	0.001	0.909	-0.006	0.064	0.001						

Note. ^a removing the intercept constraints across time of items 6, 11, 7, 32 and 9; ^b removing the intercept constraints across time of item 31, we added the error covariances between items 3 and 7, items 9 and 11 and items 31 and 35 in all models.

each country. Prior to MI analyses, we performed a series of CFAs. The one-factor CFA model for the combined relationship type in the Chinese sample showed acceptable fit at T1 but was unacceptable at T2 and T3. Conversely, the same model for the Belgian sample exhibited acceptable fit at all three time points. Adding error covariances between items improved the fit of these models with unsatisfactory fit to an acceptable level (see Appendix A2 for more information). Regarding the MI across countries, full scalar invariance was established at T1, while partial scalar invariance was achieved at T2 and T3 (see Appendix A3). For the LMI, the Belgian sample exhibited full scalar invariance, whereas the Chinese sample showed partial scalar invariance (see Appendix A4). Finally, as presented in Table S11, no significant differences were found in the reported over-parenting levels across countries and time, except that Chinese adolescents reported higher level of over-parenting at T3 compared to T1 (as the reference group; Mean = 0.120, $p = 0.007$).

4. Discussion

Although the AP-s-MOPS has been widely applied across diverse cultural contexts (Chevrier et al., 2023), its MI remains unexplored. This study is the first to investigate the invariance of this scale across two cultural contexts (comparing Belgium with China), across two types of relationship (i.e., father-child and mother-child), and across three time points (with three-month interval).

4.1. The factor structure of the AP-s-MOPS

Prior to investigating the invariance of AP-s-MOPS, we examined its factor structure within each subsample. The results supported the factor structure of AP-s-MOPS in each separate sample. Of note, items 7 and 15 had factor loadings that were slightly below the evaluation criterion of 0.30 in the Chinese sample. This is not entirely surprising, because item 7 used general wordings such as “too protective” to describe over-parenting. However, in Chinese cultural context, parental protection is generally considered a manifestation of parents’ fulfilment of their responsibilities (Huang et al., 2019), which may result in this general description not being perceived as over-parenting. Additionally, item 15 may particularly reflect parents’ “general worries” for children’s safety that may stem from their overall sense of responsibility, rather than a “desire” to overprotect the child. Indeed, Chinese parents tend to pay more attention to children’s safety, considering such attention as an expression of their sense of responsibility toward their children (e.g., Chao & Tseng, 2002). It is thus not surprising that items 7 and 15 have relatively lower loadings in the Chinese sample. This calls for researchers to potentially re-evaluate the wording of items 7 and 15 when using the AP-s-MOPS to assess over-parenting in a Chinese cultural context.

4.2. MI across countries and relationship types

Regarding MI across two countries (i.e., China and Belgium) and two types of relationships (i.e., father-child and mother-child), we identified two distinct combinations: (1) at T1, partial scalar invariance across countries and full scalar invariance across the two relationship types, and (2) at T2 and T3, full scalar invariance across countries and full scalar invariance across the father-child and mother-child relationships. Notably, the partial scalar invariance across countries at T1 indicates that the AP-s-MOPS disposes of the same underlying structure in Chinese and Belgian adolescents (i.e., configural invariance), and to the same extent (i.e., metric invariance), but one should be more cautious when comparing mean levels between Chinese and Belgian adolescents. However, we needed to release only one item (item 15) to obtain partial scalar invariance across countries, and found that the variation in items across countries did not have a meaningful effect on mean-level comparisons in maternal and paternal over-parenting across countries, based on the comparison of results of the partially scalar invariant model and

the fully scalar invariant model (Putnick & Bornstein, 2016). These findings supported the use of AP-s-MOPS for investigating mean-level differences in maternal and paternal over-parenting across countries and for comparing mean levels of over-parenting across maternal and paternal over-parenting. In addition, we also found partial scalar invariance across countries for the combined relationship type. Similarly, based on the comparison of the partial and full scalar invariance models, the cross-country variability in intercept loadings had negligible effects on the cross-country mean-level differences in over-parenting for this relationship. In other words, it is feasible to compare the mean differences in over-parenting between China and Belgium when considering over-parenting for parents in general.

4.3. MI across three time points

In terms of longitudinal invariance of AP-s-MOPS, full scalar invariance was found in Belgium for the father-child, mother-child and combined relationships, indicating that longitudinal comparisons of mean over-parenting scores are meaningful across each of these three relationships. Further, partial scalar invariance was established in the Chinese sample for the mother-child and combined relationships. Nevertheless, a comparison between the results of the partially scalar invariant model and the corresponding fully scalar invariant model reasonably suggests that the items varying across time have no meaningful impact on the interpretation of mean comparisons of over-parenting across time for these two relationship types. To note, although these findings indicated that the underlying AP-s-MOPS structure is stable and comparable over a 6-month period, it is important to acknowledge that the meaning of some over-parenting behaviours may possibly evolve throughout adolescence (i.e., over a broader macro-timescale) rather than over a meso time-interval. That is, behaviours that were initially perceived as caring and protective may begin to be experienced as more intrusive and overprotective as adolescents gain more autonomy and independence (Gutman & Eccles, 2007). Future studies should therefore explore the macro-longitudinal invariance of the AP-s-MOPS across the entire adolescent developmental period.

However, we did not find evidence for longitudinal scalar invariance regarding the father-child relationship in China. The absence of scalar invariance may be due to the instability of father involvement in Chinese culture. Fathers in developing Chinese cities are more likely to adhere to traditional gender roles: ‘nan zhu wai, nv zhu nei’ (men go out for money, women stay at home for family), compared to their counterparts in developed cities like Shanghai (Leung & Shek, 2021). Our Chinese adolescent sample, drawn from top-ranked schools in such developing cities. A few fathers in such cities acknowledged they were less patient and attentive in parenting than mothers (Liu et al., 2025), which is closely aligned with the gendered division of family responsibilities. Some parents as participants explicitly attributed this difference to innate parental abilities, positing that mothers are naturally better equipped for hands-on childcare tasks, such as feeding and dressing children (Liu et al., 2025). In this context, father may limit their involvement in their children’s daily lives. At the same time, however, these fathers are also gradually adopting contemporary paternal roles, such as companions and caregivers (Liu et al., 2025). For instance, they may also actively participate in their children’s lives during available time, but financial pressures and resulting time and energy constraints may lead to instability in their involvement. Over-parenting behaviour is unlikely to emerge when father involvement is relatively consistently low, while at other moments, when father involvement is higher, their involvement and protection may more likely exceed children’s developmental level, resulting in paternal over-parenting. This may potentially explain the lack of some types of longitudinal invariance in the father-child relationship in China. Therefore, future research, such as qualitative research, is needed to better understand these dynamics in this population specifically.

4.4. Latent mean differences in over-parenting

In terms of mean-level difference in over-parenting, we found almost no evidence for cross-country differences in the latent means of over-parenting for the father-child, mother-child and combined relationships at each point in time. One potential reason is that, although intensive parenting ideology has traditionally been more normative in China (Hong & Cui, 2023), it has now become “pervasive” and represents contemporary parenting norms (Gauthier et al., 2021). Given that intensive parenting beliefs may increase the risk of over-parenting due to “much love” (Lamprianidou et al., 2025; Martin & Leloup, 2020), parents endorse this idea—regardless of cultural context—are likely to exhibit similar levels of over-parenting towards their adolescents.

Additionally, we consistently observed higher mean levels of over-parenting in mother-child relationship compared to father-child relationship. These differences were consistent across both cultural contexts, which is likely due to the fact that, in both cultural contexts, the greatest share of child-caring responsibilities continues to fall on the shoulders of mothers, putting them at greater risk for engaging in over-parenting due to more pressure (Eira Nunes et al., 2024; Venard et al., 2024). Finally, we found no significant differences in over-parenting latent means across a three-month interval, contrary to previous research (e.g., Leung & Shek, 2024). This is unsurprising, as Leung and Shek (2024) investigated changes in over-parenting on a macro-timescale (i.e., a one-year interval), which may capture broader developmental trends absent in shorter intervals. Despite this, the present findings enhance our understanding of over-parenting’s developmental trajectory at the meso-timescale.

5. Limitations

There are several limitations in the current study. Firstly, Chinese data were collected from two high schools in the developing areas. Compared to fathers in developed areas, those in developing areas may play a mix of traditional and contemporary paternal roles when involved with their children, which may lead to unstable involvement in their children’s daily lives. This regional variation may limit the generalizability of current results related to father-child relationship to other regions. Therefore, future research is needed to further validate the current findings on the cross-country invariance of the AP-s-MOPS using a Chinese sample from developed areas. Second, the Chinese and Belgian samples differed significantly on all demographic variables (except gender). However, according to Table S2, displaying associations between over-parenting and demographic variables, only a few significant correlations were observed: age is significantly related to Chinese over-parenting at all time points, and mother’s education level is associated with Belgian over-parenting at T1. These results suggest that the difference in demographic variables may have a little effect on the comparability of the Chinese and Belgian samples. Third, in the Chinese sample, participants who reported higher levels of over-parenting, as well as more male participants, dropped out more often of the study. Nevertheless, their effects were relatively small (Cramer’s $V = 0.19$ for gender and Cohen’s $d = 0.23$ for over-parenting). Notably, a FIML approach was employed to handle missing data in the current study, which is less susceptible to produce bias due to missing data than other approaches (Enders & Bandalos, 2001). Finally, the MI and LMI results for the combined relationship should be interpreted cautiously, because scores of the combined relationship were calculated by averaging mother-child and father-child relationship scores, while our Chinese sample was drawn from developing areas with relatively low paternal involvement, which may introduce potential bias. Future studies replicating these findings should collect data from developed Chinese regions (e.g., Beijing and Shanghai), where paternal involvement is relatively higher (Wang et al., 2022).

6. Conclusion

The findings first confirmed the one-factor structure of AP-s-MOPS in all subsamples. However, it is important to consider the cultural applicability of certain items when using the AP-s-MOPS with Chinese samples, as some items exhibited somewhat lower factor loadings. Moreover, our study expanded the findings of Chevrier et al. (2023) on MI of AP-s-MOPS across countries and relationship types, demonstrating that valid conclusions can be made from research related to over-parenting across countries and relationship types. Further, both Chinese and Belgian adolescents consistently reported higher levels of maternal over-parenting compared to paternal over-parenting. However, the mean levels of over-parenting reported by adolescents were comparable between China and Belgium for mothers, fathers and their combination. Finally, it was found that mean-levels in over-parenting remained relatively stable across a 6-month period in both the Chinese and Belgian sample, with the exception of the over-parenting related to the father-child relationship in the Chinese sample. Overall, the findings from this study provides robust evidence and support for the AP-s-MOPS as a valuable tool for assessing over-parenting longitudinally and across different cultural and relationship contexts.

Funding statement: The present research was supported by China Scholarship Council (CSC; No. 202208410136).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.childyouth.2026.108776>.

Data availability

Data will be made available on request.

References

- Boele, S., Denissen, J., Moopen, N., & Keijsers, L. (2020). Over-time fluctuations in parenting and adolescent adaptation within families: A systematic review. *Adolescent Research Review*, 5(3), 317–339. <https://doi.org/10.1007/s40894-019-00127-9>
- Bollen, K. (1989). Structural equations with latent variables. Wiley. <https://doi.org/10.1002/9781118619179>
- Brenning, K. M., Soenens, B., Van Petegem, S., & Kins, E. (2017). Searching for the roots of overprotective parenting in emerging adulthood: Investigating the link with parental attachment representations using an Actor Partner Interdependence Model (APIM). *Journal of Child and Family Studies*, 26(8), 2299–2310. <https://doi.org/10.1007/s10826-017-0744-2>
- Brown, T. A. (2006). Confirmatory factor analysis for applied research. Guilford Publications.
- Browne, W. J., & Draper, D. (2006). A comparison of Bayesian and likelihood-based methods for fitting multilevel models. *Bayesian Analysis*, 1, 473–514. <https://doi.org/10.1214/06-BA117>
- Bülöw, A., Boele, S., Loughheed, J. P., Denissen, J. J., van Roekel, E., & Keijsers, L. (2025). A matter of timing? Effects of parent–adolescent conflict on adolescent negative affect and depressive symptoms on six timescales. *Journal of Psychopathology and Clinical Science*, 134(4), 414–426. <https://doi.org/10.1037/abn0000987>
- Chao, R., & Tseng, V. (2002). Parenting of asians. *Handbook of Parenting*, 4, 59–93.
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Chevrier, B., Soenens, B., Zimmermann, G., Skhirtladze, N., & Van Petegem, S. (2023). The psychometric qualities of a short version of the multidimensional overprotective parenting scale. *European Journal of Developmental Psychology*, 20(3), 550–566. <https://doi.org/10.1080/17405629.2022.2079630>
- Costigan, C., & Su, T. F. (2008). Cultural predictors of the parenting cognitions of immigrant Chinese mothers and fathers in Canada. *International Journal of Behavioral Development*, 32(5), 432–442. <https://doi.org/10.1177/0165025408093662>

- Davidov, E., Meuleman, B., Cieciuch, J., Schmidt, P., & Billiet, J. (2014). Measurement equivalence in cross-national research. *Annual Review of Sociology*, 40(1), 55–75. <https://doi.org/10.1146/annurev-soc-071913-043137>
- Eberly Lewis, M. B., Slater, J., McGinley, M., & Rote, W. M. (2024). Understanding the link between anxious parental overprotection and academic confidence in emerging adults: Mediation through interpersonal and intrapersonal processes. *Journal of Social and Personal Relationships*, 41(2), 390–412.
- Eira Nunes, C., Lamprianidou, E.-A., Gaunt, R., Venard, G., & Van Petegem, S. (2024). “Momma knows best”: The relationships between mothers’ and fathers’ gender essentialism and their involvement with their adolescents. *Journal of Family Issues*, 0192513X251347316. <https://doi.org/10.1177/0192513X251347316>
- Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*, 8(3), 430–457. https://doi.org/10.1207/S15328007SEM0803_5
- Faircloth, C. (2020). Utterly heart-breaking and devastating’: Couple relationships and intensive parenting culture in a time of ‘cold intimacies’. In J. Carter, & L. Arocha (Eds.), *Romantic relationships in a time of ‘cold intimacies’* (pp. 235–260). Palgrave Macmillan.
- Gauthier, A. H., Bryson, C., Fadel, L., Haux, T., Koops, J., & Mynarska, M. (2021). Exploring the concept of intensive parenting in a three-country study. *Demographic Research*, 44, 333–348.
- Guo, M., Wang, J., Day, J., & Kirby, J. N. (2021). Validation of the fears of compassion scale in a Chinese cultural context. *Mindfulness*, 12, 683–692. <https://doi.org/10.1007/s12671-020-01534-z>
- Gutman, L. M., & Eccles, J. S. (2007). Stage-environment fit during adolescence: Trajectories of family relations and adolescent outcomes. *Developmental Psychology*, 43(2), 522–537. <https://doi.org/10.1037/0012-1649.43.2.522>
- Hawk, S. T., Keijsers, L., Hale, W. W., III, & Meeus, W. (2009). Mind your own business! Longitudinal relations between perceived privacy invasion and adolescent-parent conflict. *Journal of Family Psychology*, 23(4), 511–520. <https://doi.org/10.1037/a0015426>
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind: Intercultural cooperation and its importance for survival*. McGraw-Hill.
- Hong, P., & Cui, M. (2023). Overparenting and psychological well-being of emerging adult children in the United States and China. *Family Relations*, 72(5), 2852–2868. <https://doi.org/10.1111/fare.12839>
- Hopwood, C. J., Bleidorn, W., & Wright, A. G. (2022). Connecting theory to methods in longitudinal research. *Perspectives on Psychological Science*, 17(3), 884–894.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Huang, C.-Y., Hsieh, Y.-P., Shen, A.-C.-T., Wei, H.-S., Feng, J.-Y., Hwa, H.-L., & Feng, J. Y. (2019). Relationships between parent-reported parenting, child-perceived parenting, and children’s mental health in Taiwanese children. *International Journal of Environmental Research and Public Health*, 16(6), 1049.
- Jovanović, V., Rudnev, M., Arslan, G., Buzza, C., Dimitrova, R., Górgora, V., Guse, T., Ho, R. T., Iqbal, N., & Jámboři, S. (2022). The Satisfaction with Life Scale in adolescent samples: Measurement invariance across 24 countries and regions, age, and gender. *Applied Research in Quality of Life*, 17(4), 2139–2161.
- Kenny, D. A. (2025). Measuring model fit. Retrieved from <http://davidakenny.net/cm/fit.htm>
- Kins, E., & Soenens, B. (2013). Generation me and its helicopter parents: A study on parental overprotection in adolescence. 16th European conference of developmental psychology, Lausanne, Switzerland.
- Kline, R. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Publications.
- Lamprianidou, E.-A., Eira Nunes, C., Antonietti, J.-P., & Van Petegem, S. (2025). Intensive parenting among mothers and fathers: Identifying profiles and examining differences in parental involvement. *Journal of Family Psychology*, 39(5), 675–686. <https://doi.org/10.1037/fam0001283>
- Lansford, J. E., Zietz, S., Al-Hassan, S. M., Bacchini, D., Bornstein, M. H., Chang, L., Deater-Deckard, K., Di Giunta, L., Dodge, K. A., & Gurdal, S. (2021). Culture and social change in mothers’ and fathers’ individualism, collectivism and parenting attitudes. *Social Sciences*, 10(12), 459. <https://doi.org/10.3390/socsci10120459>
- Leitgöb, H., Seddig, D., Asparouhov, T., Behr, D., Davidov, E., De Roover, K., Jak, S., Meitinger, K., Menold, N., & Muthén, B. (2023). Measurement invariance in the social sciences: Historical development, methodological challenges, state of the art, and future perspectives. *Social Science Research*, 110, Article 102805.
- Leung, J. T., & Shek, D. T. (2018). Validation of the perceived Chinese overparenting scale in emerging adults in Hong Kong. *Journal of Child and Family Studies*, 27, 103–117. <https://doi.org/10.1007/s10826-017-0880-8>
- Leung, J. T., & Shek, D. T. (2021). Relationships between perceived paternal and maternal sacrifice and developmental outcomes of Chinese adolescents experiencing economic disadvantage. *Applied Research in Quality of Life*, 16(6), 2371–2386. <https://doi.org/10.1007/s11482-020-09821-6>
- Leung, J. T., & Shek, D. T. (2024). Overparenting and psychological wellbeing among Chinese adolescents: Findings based on latent growth modeling. *Journal of Research on Adolescence*. <https://doi.org/10.1111/jora.12960>
- Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American statistical Association*, 83(404), 1198–1202.
- Liu, Y., Guo, M., Dittman, C. K., Zheng, Y., & Haslam, D. M. (2025). A qualitative study of father involvement with their young children in mainland China. *Frontiers in Psychology*, 16, Article 1542136. <https://doi.org/10.3389/fpsyg.2025.1542136>
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149.
- Martin, C., & Leloup, X. (2020). La parentalisation du social. In (pp. 5-18): Érudit.
- Mathijs, L., Mouton, B., Zimmermann, G., & Van Petegem, S. (2024). Overprotective parenting and social anxiety in adolescents: The role of emotion regulation. *Journal of Social and Personal Relationships*, 41(2), 413–434.
- Meeussen, L., & Van Laar, C. (2018). Feeling pressure to be a perfect mother relates to parental burnout and career ambitions. *Frontiers in Psychology*, 9, 2113.
- Meeussen, L., Van Rossum, A., Van Laar, C., & Derks, B. (2022). Gender stereotypes: What are they and how do they relate to social inequality?. In *Solidarity and social justice in contemporary societies: An interdisciplinary approach to understanding inequalities* (pp. 79–86). Springer.
- Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika*, 58, 525–543.
- Moehring, A., Guertler, D., Krause, K., Bischof, G., Rumpf, H.-J., Batra, A., Wurm, S., John, U., & Meyer, C. (2021). Longitudinal measurement invariance of the patient health questionnaire in a German sample. *BMC Psychiatry*, 21(1), 386.
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user’s guide: Statistical analysis with latent variables: User’s guide*. Muthén & Muthén.
- Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review*, 41, 71–90. <https://doi.org/10.1016/j.dr.2016.06.004>
- Rodriguez, V. J., La Barrie, D. L., Zegarac, M. C., & Shaffer, A. (2023). A systematic review of parenting scales measurement invariance/equivalence of by race and ethnicity: Recommendations for inclusive parenting research. *Assessment*, 30(1), 22–36. <https://doi.org/10.1177/1073191211038630>
- Ryan, K. M., Zimmer-Gembeck, M. J., Speechley, M., Stuart, J., Soenens, B., Zimmermann, G., & Van Petegem, S. (2024). Identifying correlates of demanding and responsive features in Helicopter and overprotective parenting. *Journal of Child and Family Studies*, 33(9), 2826–2843. <https://doi.org/10.1007/s10826-024-02896-x>
- Sanders, M. R., & Morawska, A. (2010). *Family background questionnaire*. Parenting and Family Support Centre: University of Queensland.
- Schoppe-Sullivan, S. J., & Fagan, J. (2020). The evolution of fathering research in the 21st century: Persistent challenges, new directions. *Journal of Marriage and Family*, 82(1), 175–197. <https://doi.org/10.1111/jomf.12645>
- Segrin, C., Wozidlo, A., Givertz, M., Bauer, A., & Taylor Murphy, M. (2012). The association between overparenting, parent-child communication, and entitlement and adaptive traits in adult children. *Family Relations*, 61(2), 237–252. <https://doi.org/10.1111/j.1741-3729.2011.00689.x>
- Shek, D. T. L. (2006). Chinese family research: puzzles, progress, paradigms, and policy implications. *Journal of Family Issues*, 27(3), 275–284. <https://doi.org/10.1177/0192513X05283508>
- Skhirtladze, N., & Van Petegem, S. (2024). Perceived overprotective parenting and identity synthesis and confusion in georgian emerging adults: The intervening role of goal engagement and disengagement. *Journal of Adult Development*, 1–11. <https://doi.org/10.1007/s10804-024-09475-w>
- Tagliabue, S., Zambelli, M., Sorgente, A., Sommer, S., Hoellger, C., Buhl, H. M., & Lanz, M. (2021). Latent congruence model to investigate similarity and accuracy in family members’ perception: The challenge of cross-national and cross-informant measurement (non) invariance. *Frontiers in Psychology*, 12, Article 672383. <https://doi.org/10.3389/fpsyg.2021.672383>
- Thomasgard, M., Metz, W. P., Edelbrock, C., & Shonkoff, J. P. (1995). Parent-child relationship disorders. Part I. Parental overprotection and the development of the parent protection scale. *Journal of Developmental & Behavioral Pediatrics*, 16(4), 244–250.
- Van Petegem, S., Albert Sznitman, G., Darwiche, J., & Zimmermann, G. (2022). Putting parental overprotection into a family systems context: Relations of overprotective parenting with perceived coparenting and adolescent anxiety. *Family Process*, 61(2), 792–807. <https://doi.org/10.1111/famp.12709>
- Van Petegem, S., Antonietti, J.-P., Eira Nunes, C., Kins, E., & Soenens, B. (2020). The relationship between maternal overprotection, adolescent internalizing and externalizing problems, and psychological need frustration: A multi-informant study using response surface analysis. *Journal of Youth and Adolescence*, 49, 162–177. <https://doi.org/10.1007/s10964-019-01126-8>
- Van Petegem, S., Vansteenkiste, M., & Beyers, W. (2013). The jingle-jangle fallacy in adolescent autonomy in the family: In search of an underlying structure. *Journal of Youth and Adolescence*, 42(7), 994–1014.
- Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3(1), 4–70.
- Venard, G., Lamprianidou, E.-A., Eira Nunes, C., del Rio Carral, M., Van Petegem, S., & Zimmermann, G. (in press). Contemporary parenting norms and coparenting coordination: Exploring narratives of parents of adolescents. *Family Relations: Interdisciplinary Journal of Applied Family Science*.
- Venard, G., Zimmermann, G., Antonietti, J.-P., Nunes, C. E., & Van Petegem, S. (2024). Parenting under pressure: Associations between perceived social pressure and parental involvement among mothers and fathers. *Journal of Child and Family Studies*, 33(12), 3813–3825. <https://doi.org/10.1007/s10826-024-02945-5>
- Wang, L., Li, H., Dill, S.-E., Zhang, S., & Rozelle, S. (2022). Does paternal involvement matter for early childhood development in rural China? *Applied Developmental Science*, 26(4), 741–765. <https://doi.org/10.1080/10888691.2021.1990061>
- Wang, Y., Boele, S., Bülow, A., Keijsers, L., & Hawk, S. T. (2025). Helicopter parenting and youth affective well-being: Need satisfaction as a within-family mediator.

- Journal of Youth and Adolescence*, 1–17. <https://doi.org/10.1007/s10964-025-02164-1>
- Wang, Y., Hawk, S. T., & Branje, S. (2023). Educational identity and maternal helicopter parenting: Moderation by the perceptions of environmental threat. *Journal of Research on Adolescence*, 33(4), 1377–1390. <https://doi.org/10.1111/jora.12884>
- Xiong, Y., Qin, L., Wang, Q., Wang, M., & Pomerantz, E. M. (2022). Reexamining the cultural specificity of controlling and autonomy-supportive parenting in the United States and China with a within-individual analytic approach. *Developmental Psychology*, 58(5), 935–949. <https://doi.org/10.1037/dev0001329>
- Yaşlıoğlu, M., & Yaşlıoğlu, D. T. (2020). How and when to use which fit indices? A practical and critical review of the methodology. *Istanbul Management Journal*, 88, 1–20. <https://doi.org/10.26650/imj.2020.88.0001>
- Zhao, X., Dale, C., Hare, M., DiMarzio, K., Hayes, T., Ahemaitijiang, N., Han, Z. R., & Parent, J. (2023). Measurement invariance in the assessment of parenting practices: A cross-cultural comparison of China and the United States. *Journal of Family Psychology*, 37(6), 774. <https://doi.org/10.1037/fam0001099>
- Zong, W., & Hawk, S. T. (2022). Evaluating the structure and correlates of helicopter parenting in mainland China. *Journal of Child and Family Studies*, 31(9), 2436–2453. <https://doi.org/10.1007/s10826-022-02370-6>