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Cool and hot effortful control moderate how parenting predicts child internalization in Chinese families



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ABSTRACT

Internalization of external rules is a behavioral manifestation of moral development during childhood, and its development has come to be understood from the view of a complex parenting-by-temperament process. To examine this developmental process, the current research investigated how maternal parenting behaviors and child effortful control foretell internalization throughout early to middle childhood with two longitudinal samples of Chinese mother-child dyads. In Study 1 ($N = 226$), maternal respect for autonomy and negative control during free plays at 15 months of age were observed. At 25 months, child cool and hot effortful control were measured with a Stroop-like categorization task and an externally imposed delay task. At 37 months, observed internalization of maternal rules was assessed. Results showed that for toddlers with high levels of cool effortful control, maternal respect for autonomy positively predicted later internalization. In Study 2 ($N = 88$), maternal respect for autonomy and negative control during free plays at 38 months of age were coded. At 60 months, child cool and hot effortful control were measured with a Stroop-like inhibition task and a delay-of-gratification task. Observed internalization of maternal and experimenter rules and mother-reported internalization in everyday life were assessed at 60 and 84 months. Results showed that for children low on either cool or hot effortful control, maternal respect for autonomy negatively predicted later internalization during childhood. Together, the current findings support an age-relevant goodness-of-fit model for internalization

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development in Chinese children throughout the first 7 years of life.

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Introduction

Internalization of external rules is a behavioral manifestation of moral development during early childhood (Kochanska & Aksan, 2006). Defined as taking in values and standards as one's own, internalization undergoes substantial development during the first few years of life (Augustine & Stifter, 2015; Kochanska, Coy, & Murray, 2001) and continues to develop throughout adolescence (Laible, Eye, & Carlo, 2008). The development of internalization and individual differences in this development are of great importance for understanding why in society most members are law abiding, whereas some members show contempt for rules.

The early development of internalization has come to be understood from the view of complex person-by-environment transactions. Theorists suggest that socialization factors, such as parenting, combine with individual factors, such as temperament (e.g., effortful control), in carving child internalization (Kochanska & Aksan, 2006). Some longitudinal, observational studies have also illuminated this parenting-by-temperament effect on internalization (Augustine & Stifter, 2015; Kochanska & Kim, 2014). However, several research gaps remain concerning whether this developmental process applies to children from non-Western sociocultural backgrounds and to specific developmental conditions.

First, previous studies were conducted primarily with Western samples. Whether similar processes are applicable to samples from other cultures (e.g., Chinese families) needs to be examined. Second, although parenting behaviors related to a child's need for autonomy (i.e., independent actions to control and realize mental states such as wishes, intentions, and preferences; Keller, 2012) have been associated with internalization during adolescence (e.g., Vansteenkiste, Soenens, Van Petegem, & Duriez, 2014), whether those parenting behaviors are predictive of internalization during childhood is less known. Third, although various subdimensions of effortful control have been differentiated (e.g., Zelazo & Carlson, 2012), past research has not distinguished these subdimensions when investigating the link between effortful control and internalization as well as the parenting-by-effortful control effects on internalization. The current research was conducted to address these important research gaps.

Maternal parenting behaviors and child internalization

Among children from Western cultures, researchers have found two parenting behaviors that are important for internalization development: respect for autonomy (e.g., providing choices, recognizing children's perspectives, offering a rationale) and negative control (e.g., criticism, threatening, physical force). Theoretically, respect for autonomy facilitates proficiencies in internalization (Grolnick, Deci, & Ryan, 1997), whereas negative control is detrimental to the natural proneness of internalization (Laurin & Joussemet, 2017). Empirically, a moderate-sized positive association of adolescent-reported maternal respect for autonomy (Vansteenkiste et al., 2014) and a moderate-sized negative association of observed maternal negative control during early childhood (Kochanska, Aksan, & Nichols, 2003) have been found with child internalization. Moreover, a positive association of respect for autonomy and a negative association of negative control were also found with the precursor of rudimentary internalization—committed compliance over time (Laurin & Joussemet, 2017). Yet the generalizability of these associations to children from non-Western cultures is still unknown.

To our knowledge, no empirical evidence has been reported on internalization of Chinese children, although cross-cultural studies on similar moral development outcomes have found mixed results. For example, Chinese children outperformed Canadian children on compliance with maternal rules during

toddlerhood (Chen et al., 2003) but shared less with their peers compared with Canadian children during middle childhood (Cowell et al., 2017). Such differences could be explained, at least in part, by the differences in parenting behaviors across cultures. Indeed, Chinese mothers have been shown to display lower respect for autonomy (Liu et al., 2005) and higher negative control (Chao, 2000) compared with Western parents.

Influenced by Confucianism, Chinese parents attempt to achieve the culture-specific socialization goals such as abiding by social norms (Li) and self-restraint (Yuē) (Luo, Tamis-LeMonda, & Song, 2013). These goals, through influencing culture-specific parenting styles and practices, may affect Chinese children's internalization. For instance, Chinese parents have high expectations for children's behavioral self-restraint (Chen et al., 2003) and a strong belief that children's development depends on their effort and training (Guān) (Chao, 2000). They start to teach and train Chinese children to follow parental rules from an early age in a controlling manner (Chao, 2000). Chinese children are expected to be well prepared for internalizing standards without surveillance before entering preschool.

In support of such an idea, a cultural emphasis on strict parental discipline is found to explain young Chinese children's orientation toward complying with authority (Yau, Smetana, & Metzger, 2009). During the transition from early to middle childhood, however, parental autonomy support, rather than negative control, is predictive of Chinese children's performance on cognitive tasks when alone (Zhang & Whitebread, 2019). Therefore, it is possible that maternal negative control may act as a behavioral guideline that could instill externally motivated internalization in young Chinese children when they have only limited self-control skills (Yu, Cheah, Hart, & Yang, 2018). To have child internalization continue to flourish, however, maternal respect for autonomy is needed to help in establishing self-endorsement of standards of conduct (Grolnick et al., 1997). Drawn from two samples of Chinese children with varied age ranges (15–37 months vs. 38–84 months), the first goal was to examine these longitudinal associations between these two parenting behaviors and child internalization throughout early and middle childhood. Specifically, we expected that negative control would predict child internalization during early childhood and that respect for autonomy would predict child internalization from early to middle childhood.

Cool and hot effortful control and child internalization

In addition to maternal parenting behaviors, children's differences in internalization are also partially rooted in temperamental traits (Augustine & Stifter, 2015; Kochanska & Aksan, 2006). In the current research, we focused on effortful control, the macrodimension of temperamental self-regulation referring to the ability to voluntarily inhibit, activate, or modulate attention and behaviors and to plan, detect errors, and integrate information (Eisenberg, Smith, Sadovsky, & Spinrad, 2004). In an early series of replication studies by Kochanska and colleagues (Kochanska et al., 2001; Kochanska & Knaack, 2003; Kochanska, Murray, Jacques, Koenig, & Vandegest, 1996), it was confirmed that 5–16% of the individual differences in internalization are accounted for by observed effortful control.

More recently, however, researchers have distinguished both cool and hot dimensions of effortful control (Zelazo & Carlson, 2012). Cool effortful control demands a more abstract form of attentional regulation (Di Norcia, Pecora, Bombi, Baumgartner, & Laghi, 2015), whereas hot effortful control calls for suppressing an emotionally aroused response (Zelazo, Qu, & Kesek, 2010). Past research has suggested that hot and cool effortful control might be differentially associated with constructs relevant (e.g., externalizing behaviors) or similar (e.g., compliance, prosocial behavior, moral behavior) to internalization, but the findings are somewhat mixed and the associations are dependent on the constructs studied.

Consistent findings have been found on associations of cool and hot effortful control with externalizing behaviors (i.e., a lack of internalization; Kochanska, Brock, & Boldt, 2017). Specifically, compared with cool effortful control, hot effortful control is more strongly related to externalizing behaviors (Backer-Grøndahl, Nærde, & Idsoe, 2019; Gusdorf, Karreman, van Aken, Deković, & van Tuijl, 2011; Woltering, Lishak, Hodgson, Granic, & Zelazo, 2016). Although cool and hot effortful control are differentially associated with moral development as well, the results are somewhat contradictory. Hot, but

not cool, effortful control was positively related to prosocial behavior in toddlers (Di Norcia et al., 2015). In contrast, hot, but not cool, effortful control was negatively associated with moral behavior in preschoolers (Stifter, Cipriano, Conway, & Kelleher, 2009). Other studies have not found any associations between both cool and hot effortful control and compliance (Duvall, Erickson, MacLean, LaFavor, & Lowe, 2017) or donating behavior (Hao, 2017) during early childhood. Only one study focused on internalization and found a concurrent positive link between cool effortful control and mother-reported internalization in 5-year-olds (Heikamp, Trommsdorff, Druey, Hübner, & Von Suchodoletz, 2013), but hot effortful control was not examined.

Such inconsistencies may be understood in light of the different skills manifested by these two dimensions of effortful control. By nature, cool and hot effortful control involve a different mix of two inhibitory skills: strength (i.e., the ability to suppress responses that are *high in prepotency*) and endurance (i.e., the ability to suppress responses that remain *active for a long time*) (Simpson & Carroll, 2019). Cool effortful control (tapped by Stroop-like inhibition tasks) demands a higher level of inhibitory strength and a lower level of inhibitory endurance, whereas hot effortful control (tapped by delay-of-gratification tasks) demands a reverse balance of strength and endurance. As such, cool effortful control is presumably associated with on-task cognitive performance, whereas hot effortful control is presumably associated with real-life long-term outcomes (Simpson & Carroll, 2019). Parent-reported externalizing behaviors may manifest such long-term accumulation of deviant behaviors. Moral development tasks are more complex in that they measure child on-task performance and tap into child-acquired abilities or skills, thereby requiring both inhibitory strength and endurance depending on specific task requirements.

In our research, internalization tasks also tap both the on-task performance on following rules and the cognitive maturity of capacity to take in standards of conduct. Thus, both cool and hot effortful control might be developmentally relevant. Because no studies have included separate measures of both cool and hot effortful control and examined their associations with child internalization separately, the second goal was to extend past research by investigating these associations.

Parenting-by-effortful control interactions predict child internalization

Despite the existing findings on the direct associations of parenting behaviors with child temperament, how the interplay between parenting behaviors and child effortful control predicts later internalization still needs to be investigated. In the literature of moral development, two theoretical perspectives could be used to hypothesize how effortful control affects the relation between parenting and internalization: (a) the differential susceptibility model (Belsky, Bakermans-Kranenburg, & van IJzendoorn, 2007; Slagt, Dubas, Deković, & van Aken, 2016) and (b) the goodness-of-fit model (Belsky et al., 2007).

Regarding the differential susceptibility model, a low level of effortful control may act as a marker of children's sensitivity to parenting. Drawing from this model, children with low effortful control would be more responsive to positive parenting, including respect for autonomy. They would ultimately display higher internalization than those with high effortful control when maternal respect for autonomy is at high levels. Children with low effortful control would also be more responsive to negative parenting, including negative control. They would exhibit lower internalization than their peers with high effortful control when maternal negative control is at high levels. Respectively, for children with high effortful control, a weaker or no link between these parenting behaviors and later internalization would be expected because they are less sensitive to the potential influences of parenting behaviors.

With respect to the goodness-of-fit model, which aspect of parenting would scaffold or hinder children's internalization would depend on children's level of effortful control. For children with a high level of effortful control, respect for autonomy would scaffold their internalization because they are more developmentally prepared for having their internalization calibrated by this parenting (Ryan, Kuhl, & Deci, 1997), whereas negative control would hamper internalization because of a mismatch between this parenting behavior and their self-regulation level (Kiff, Lengua, & Zalewski, 2011). For

children with a low level of effortful control, negative control would facilitate internalization because they need external control and behavioral corrections to guarantee their compliance with adults' rules (Houtepen, Sijtsema, Klimstra, Van der Lem, & Bogaerts, 2019; Kiff et al., 2011), whereas respect for autonomy would hinder internalization because they are too immature to benefit from allowing their own initiatives and independence for internalization development (Kiff et al., 2011).

The empirical research on these two models, however, has been scarce for child moral development, and no consistent associations have been found among studies. One study found that effortful control modified the positive association between responsive parent-child relationship and internalization across early and middle childhood, with this association being stronger for children low on effortful control than for children high on effortful control (Kochanska & Kim, 2014), thereby partially supporting the differential susceptibility model. Yet in a recent meta-analysis of parenting-by-temperament interactions (Slagt, Dubas, Deković, et al., 2016), effortful control was not found to indicate child sensitivity to positive or negative parenting behaviors for positive outcomes such as internalization. On other moral development outcomes, one study showed that maternal negative control positively predicted later prosocial behavior only for preschoolers with low effortful control (Yu et al., 2018), partially supporting the goodness-of-fit model, whereas another study found no moderation for effortful control on the association between negative control and later prosocial behavior during middle childhood (Slagt, Dubas, & van Aken, 2016).

Such incongruent moderations were found on child externalizing behaviors as well. In one study, the moderation by effortful control was not in line with either the goodness-of-fit model or the differential susceptibility model, showing that only for children with high effortful control did maternal negative control negatively predict externalizing behaviors during late childhood (Lengua, 2008). But another study found no moderation on the association between negative control and externalizing behaviors for effortful control during middle childhood (Slagt, Dubas, & van Aken, 2016). Notwithstanding this inconsistency for the composite of effortful control, similar moderating roles of cool and hot effortful control have been found recently. Both cool and hot effortful control moderated the association between positive, but not negative, parenting and child externalizing behaviors during the transition from early to middle childhood (Reuben et al., 2016). Only for children with low cool and hot effortful control did positive parenting foretell lower externalizing behaviors (Reuben et al., 2016), which supports the differential susceptibility model.

It is challenging to address such inconsistencies in the field because the aforementioned studies differ in at least three ways: the age ranges of samples, the parenting behaviors measured, and the assessments of child effortful control. In the current research, we attempted to address these issues by testing those moderation effects across various developmental periods (from toddlerhood to the preschool years and from the preschool years to the school years), including both positive and negative parenting when probing those moderations and differentiating between cool and hot effortful control. Our examination may help to determine whether the differential susceptibility model or the goodness-of-fit model best applies to the parenting-by-effortful control effects, which still remains unclear in the literature. Therefore, the third goal was to examine how maternal parenting behaviors, either positive (respect for autonomy) or negative (negative control), combine with child effortful control, either hot or cool, to predict child internalization over time throughout early and middle childhood.

The current studies

Drawn from two longitudinal observational samples of Chinese families, the current research investigated the contributions of parenting behaviors and child effortful control to later internalization. In Study 1, we examined whether respect for autonomy and negative control at 15 months of age and child cool and hot effortful control at 25 months predicted internalization of maternal rules at 37 months. In Study 2, we examined whether respect for autonomy and negative control at 38 months of age and child cool and hot effortful control at 60 months foretold an aggregated measure of internalization across 60 to 84 months.

Study 1

Method

Participants

The first sample was drawn from an ongoing project, BELONGS 2015 (Beijing Longitudinal Study 2015), that began in 2015 when infants were 6 months old. The initial sample was recruited from several maternity and well-baby clinics of regional hospitals in Beijing, China, or through signing up on the project website. A total of 242 infants (119 girls and 123 boys) and their families were recruited at Wave 1. In addition to the initial sample, 52 participants (23 girls and 29 boys) were recruited in later waves. Compared with the initial sample, the participants who were recruited in any later waves did not differ in gender ratio, $\chi^2(1) = 0.42, p = .52$, parental education status, and parental monthly income, (Mann–Whitney U test $z_s < 1.76, p_s > .08$). Those who were recruited later were slightly older than the initial sample at Wave 4 (37.85 vs. 37.20 months), $t(187) = 2.20, p = .03$. These two groups of participants were combined given that they were generally similar.

In this study, we focused on the assessments at Wave 2 (14.60 \pm 0.56 months), Wave 3 (24.78 \pm 2.35 months), and Wave 4 (37.28 \pm 1.31 months). The families who participated at least once during these waves were included. The attrition analyses found that, compared with those who were omitted due to attrition ($n = 68$; 31 girls and 37 boys), the included parents were older and had higher education status and monthly income ($z_s > 2.23, p_s < .03$). The main causes of attrition included that (a) the parents indicated their decision to withdraw from the project, (b) the families left Beijing and were not able to continue participating in the project, and (c) the parents were busy and could not participate in the laboratory visit. The final sample ($N = 226$; 111 girls and 115 boys) was mainly from a highly educated population in Beijing, as indicated by the modes of maternal and paternal monthly income between 6000 and 10,000 yuan and by 90% of parents having completed college or postgraduate education.

Measures

Maternal parenting behaviors at 15 months. The observational coding manual of parent–child interactions (Lengua, 2009) was used to rate parenting behaviors during mother–child free plays at 15 months of age. Maternal verbal and nonverbal behaviors were considered. Two dimensions of parenting were rated on a scale ranging from 1 (*very low*) to 5 (*very high*) separately for two 5-min free-play tasks. The free-play task was used because it may maximally mimic mother–child interactions in a naturalistic setting, and Chinese mothers have been found to display a range of positive and negative behaviors in this task (Liu & Guo, 2010).

Respect for autonomy includes behaviors that allow the child to initiate the interaction and decide what to do during the interaction as well as encourage the child's independent decision making and expressions of autonomy. For example, the mother provides the child with choices by saying, "You can do this, or you can do that." *Negative control* includes prohibitions given without explanation, verbal intrusiveness and interruption, and physical intrusiveness and exclusion of the child's involvement. Such behaviors are ill-timed, inappropriate, or excessive for the child's needs. For example, the mother grabs a toy away from the child and says, "Don't play with this."

After being trained by an expert, two master students who were blind to the hypotheses of this study coded all the mother–child free plays. Specifically, to reduce the bias resulting from familiarity with the videos, an independent coding procedure was used; for each participant, one coder rated respect for autonomy and another coder rated negative control, and these coders were blind to the ratings of another dimension of parenting throughout the coding session. Based on 16% of the video sample, the intraclass correlation (ICC) for respect for autonomy was .83 and for negative control was .88. Maternal respect for autonomy and negative control was calculated by averaging the ratings across two free-play tasks.

Child effortful control at 25 months. Cool effortful control. The reverse categorization task (Carlson, Mandell, & Williams, 2004) is a Stroop-like inhibition task measuring cool effortful control. First,

the experimenter demonstrated the rules by putting three larger blocks into the “big” box and three smaller blocks into the “small” box. Then, children were presented with three larger and three smaller blocks and were asked to help the experimenter sort the blocks into the boxes according to their sizes. After establishing the predominant responses, the experimenter suggested playing the game with the reverse categorization rule (small blocks in the “big” box and large blocks in the “small” box). The experimenter presented 1 of the 12 blocks randomly with a reminder about the rule at each presentation. The accuracy of the 12 trials was used.

Hot effortful control. The externally imposed delay task (Kochanska, Murray, & Harlan, 2000) was used to measure hot effortful control. The experimenter presented an open transparent box containing an attractive singing toy tiger to the child. She asked the child to not touch the toy before she came back. On the child’s indication of understanding, she left the room for a maximum of 3 min or until 30 s after the child touched the toy. The mother could stay in the room but was instructed to provide no hints. The latency of touching (1–180 s) was divided by 180, and the proportion score was used.

Internalization of maternal rules at 37 months. The 5-min internalized cleanup task (Kochanska et al., 2001) was used, which requires the child to adhere to maternal rules and concentrate on tedious sorting work. The child’s behavior during every 10-s segment was coded into one of two broad categories: (a) internalized cleanup or (b) oppositional behaviors. In addition, the latency of the first oppositional behavior was recorded using 1-s units (0–300 s). Based on 25% of the videos, the kappa value was .95 between two coders. The proportion scores of internalized cleanup and oppositional behaviors were calculated by dividing each frequency by the number of total segments. Adapted from the method used in Kochanska et al. (2003), the standardized scores of internalized cleanup, (reversed) oppositional behaviors, and latency were averaged to create a composite for analyses.

Analytic plan

Preliminary analyses and moderation analyses were conducted in Mplus (Muthén & Muthén, 1998–2017) using maximum likelihood estimation with robust standard errors (MLR). The missing completely at random (MCAR) assumption was tenable because Little’s MCAR test was nonsignificant (Little, 1988), $\chi^2(33) = 42.26, p = .13$. Missing data were handled by a full information maximum likelihood (FIML) method. A moderation model was estimated and included the two maternal parenting behaviors, child cool and hot effortful control, and their unique interaction. Interactions were calculated by multiplying the centered parenting behavior with the centered effortful control. Significant interaction terms were further probed by depicting regions of significance.

Results and summary

Preliminary analyses

The means, standard deviations, and correlations among variables are presented in Table 1. No gender difference was found on any variables, Wald test, all $\chi^2(1) < 2.78, ps > .09$. Respect for autonomy was positively related to hot effortful control but not cool effortful control, whereas negative control was negatively associated with both cool and hot effortful control. However, neither maternal parenting behaviors nor child effortful control was associated with internalization of maternal rules. Because the correlation between respect for autonomy and negative control was relatively high ($r = -.57, p < .001$), to reduce the potential multicollinearity risk, we estimated a latent variable in the subsequent moderation model to capture the covariance of these two observables (Grewal, Cote, & Baumgartner, 2004).

Moderation analyses

In Table 2, a moderation model accounting for the covariance between respect for autonomy and negative control is estimated ($N = 226, R^2 = .09, \text{post hoc power} = .94$). No direct predictions of maternal parenting behaviors or cool and hot effortful control were found. Two significant interaction terms were found for internalization of maternal rules: Respect for Autonomy \times Cool Effortful Control and Negative Control \times Hot Effortful Control. Follow-up analyses using the region-of-significance technique revealed that for toddlers high on cool effortful control (from $M + 0.61 SD$ to $M + 1.52 SD$),

Table 1
Means, standard deviations, and correlations among variables in Study 1.

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1 Respect for autonomy, 15 months	173	3.37	0.83					
2 Negative control, 15 months	173	3.42	0.66	-.57**				
3 Cool effortful control, 25 months	178	0.50	0.33	.10	-.20*			
4 Hot effortful control, 25 months	186	0.35	0.39	.20*	-.23**	.13		
5 Internalization of maternal rules, 37 months	145	0.00	0.87	.14	-.11	.09	.09	

* *p* < .05.
** *p* < .01.

Table 2
Cool or hot effortful control at 25 months moderates the relations between 15-month maternal parenting behaviors and 37-month internalization of maternal rules.

Predictor	Internalization of maternal rules	
	<i>B</i>	β
Main effects		
Respect for autonomy	0.11	.10
Negative control	-0.05	-.04
Cool effortful control	0.14	.05
Hot effortful control	0.10	.04
Moderation effects		
Respect for Autonomy \times Cool Effortful Control	0.76*	.22*
Respect for Autonomy \times Hot Effortful Control	-0.43	-.14
Negative Control \times Cool Effortful Control	0.33	.08
Negative Control \times Hot Effortful Control	-0.57 [†]	-.18*
<i>R</i> ²		.09

[†] *p* = .05.
* *p* < .05.

respect for autonomy positively predicted internalization of maternal rules, but this relation was not significant for toddlers with low cool effortful control (from *M* - 1.55 *SD* to *M* + 0.61 *SD*) (see Fig. 1). Unexpectedly, no significant associations between negative control and internalization of maternal rules were found within the observed range of hot effortful control (from *M* - 0.89 *SD* to *M* + 1.65 *SD*) (see Fig. 2).¹ Thus, results indicate a moderation effect by cool effortful control on the positive link between respect for autonomy and child internalization. However, the moderation effect by hot effortful control on the negative link between negative control and child internalization was tentative considering that the observed range of hot effortful control at this developmental period was not within the regions found to be significant.²

Summary

In Study 1, we examined the contributions of maternal respect for autonomy and negative control and of child cool and hot effortful control to internalization during the first 3 years of life. First, neither

¹ We probed this interaction effect by testing the simple slopes for hot effortful control at levels larger than the observed range (i.e., *M* ± 2 *SD*). Results indicate that when hot effortful control is at a high level (*M* + 2 *SD*), negative control negatively predicts internalization of maternal rules (*B* = -0.50, *p* < .05), whereas when hot effortful control is at a low level (*M* - 2 *SD*), negative control does not predict internalization of maternal rules (*B* = 0.39, *p* = .18). This pattern of moderation is in line with a goodness-of-fit model.

² After we reran the model with more strictly statistical control for the potential multicollinearity by examining the moderation effects separately for cool and hot effortful control and fixing the covariance between interaction terms (e.g., between respect for autonomy \times cool effortful control and negative control \times cool effortful control) to zero, the region-of-significance analyses yielded similar results.

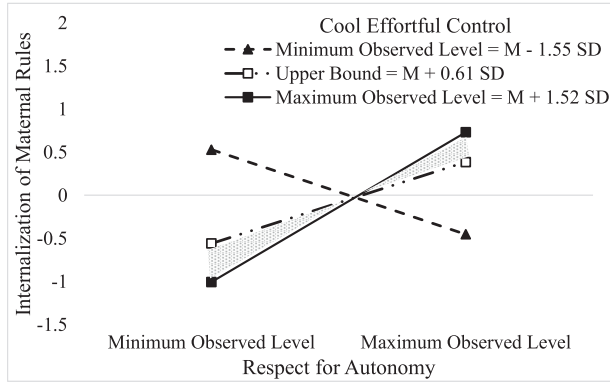


Fig. 1. Cool effortful control at 25 months moderates the association between 15-month maternal respect for autonomy and 37-month internalization of maternal rules. The regions-of-significance analyses are based on the observed ranges of cool effortful control. The dot-shaded area illustrates the significant region representing a positive relation between maternal respect for autonomy and internalization when cool effortful control is high.

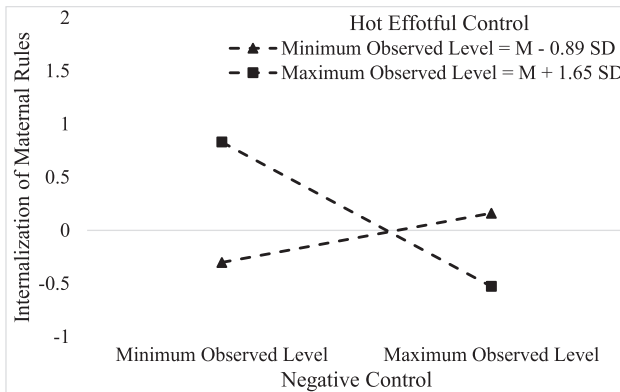


Fig. 2. Hot effortful control at 25 months moderates the association between 15-month maternal negative control and 37-month internalization of maternal rules. Negative control did not predict internalization of maternal rules within the observed range of hot effortful control. At the minimum observed level of hot effortful control, $B = 0.14$ and $p = .46$. At the maximum observed level of hot effortful control, $B = -0.42$ and $p = .06$.

of the two maternal parenting behaviors directly predicted internalization of maternal rules. This result is in contrast to our expectation yet is consistent with the notion that parenting behaviors that are related to child autonomy might not directly link to Chinese children’s socioemotional outcomes due to a lack of cultural endorsement of autonomy (Liu, Chen, Zheng, Chen, & Wang, 2009).

Instead, the interplay between respect for autonomy and cool effortful control was predictive of later internalization. For toddlers high on cool effortful control, respect for autonomy positively predicted internalization, whereas for toddlers low on cool effortful control, no association was found. The finding is not in line with the differential susceptibility model.³ Rather, this finding is consistent with the pattern of a goodness-of-fit model, which purports that children with high, but not low, effortful

³ We also calculated the proportion of interaction (Pol) that can be used to judge whether the interaction effect is consistent with the differential susceptibility model (Roisman et al., 2012). The Pol for this respect for autonomy-by-cool effortful control interaction is 0.71 (crossover point = -0.19), which does not meet the requirement of the differential susceptibility model (Pol ranges from 0.40 to 0.60; Roisman et al., 2012).

control would benefit from maternal respect for autonomy, presumably because toddlers with high effortful control already acquire adequate cognitive skills to have their internalization scaffolded by this parenting behavior. Respect for autonomy, then, helps these toddlers to conduce toward more active assimilation and identification with maternal values and rules (Grolnick et al., 1997).

In addition, a negative control-by-hot effortful control effect was found on internalization of maternal rules, and the pattern of the simple slopes at the maximum versus minimum levels of hot effortful control resembles a goodness-of-fit model.⁴ Yet within the observed range of hot effortful control, maternal negative control was not significantly associated with child internalization. Consequently, we are cautious about this interaction effect and question its meaningfulness for our participants. Two tentative interpretations are offered for this result.

First, it is possible that effortful control matters for internalization development but only when both cool and hot effortful control have reached a relatively similar developmental level. It has been found that the development of hot effortful control lags behind that of cool effortful control (Simpson & Carroll, 2019; Zelazo & Carlson, 2012), such that cool effortful control may take on the regulatory role during toddlerhood with the assistance of maternal respect for autonomy, whereas hot effortful control may also play a role strong enough to be detected for internalization during later developmental periods (e.g., the preschool to school years).

Alternatively, it is possible that, in line with Heikamp et al. (2013), cool effortful control may be the only dimension in effortful control that is relevant to internalization development throughout early and middle childhood. Cool effortful control, assessed by the Stroop-like inhibition task, taps into children's ability to cognitively inhibit the predominant response (violating rules to do what children desire to do) for the sake of a subdominant response (acting in accord with standard rules). It reflects how children use "top-down" control over their behaviors, which is crucial for success in internalization tasks (Heikamp et al., 2013). Hot effortful control may be more relevant to long-term real-life outcomes (e.g., externalizing behaviors; Simpson & Carroll, 2019) or in tasks that are highly incentivized (Zelazo et al., 2010) rather than tasks that require top-down control and an understanding of rules. Thus, this interaction effect by hot effortful control in Study 1 is most likely a chance finding.

Given the above interpretations, a second study was conducted to examine which explanation is more plausible and to see whether we could replicate the findings on children from the preschool to school years. To comprehensively capture internalization during childhood, another two measures (internalization of experimenter rules and mother-reported internalization in everyday life) were added to Study 2. Moreover, because parenting behaviors in macro-level coding are evaluated in the context of child responses and dependent on the content of the behaviors, which thus could be deliberately planned (Mesman, 2010), a micro-level coding scheme of parenting was used in Study 2 to obtain the nuanced predictions of maternal parenting behaviors for child internalization. Parenting behaviors in micro-level coding reflect more intuitive parenting that allows for a more objective assessment of the relations between parenting and child behaviors (Mesman, 2010). Based on the findings of Study 1, a special focus was placed on the respect for autonomy-by-effortful control effect on later internalization for the second sample.

Study 2

Method

Participants

The second sample was drawn from BELONGS 2010 (Beijing Longitudinal Study 2010). The current study used data from Waves 5 to 7. In addition to the initial sample, 15 participants (7 girls and 8 boys) with similar ages were recruited in later waves. Compared with the initial sample, the participants who were recruited in any later waves did not differ in gender ratio, $\chi^2(1) = 0.20, p = .66$, ages at

⁴ The Pol for this negative control-by-hot effortful control interaction is 0.62 (crossover point = 0.17), which also does not meet the requirement of the differential susceptibility model (Roisman et al., 2012).

Wave 7, $t(74) = 1.57$, $p = .12$, parental education status, and parental monthly income ($z_s < 1.30$, $p_s > .20$). Therefore, these participants were added to the initial sample.

The final sample consisted of 88 children (52 girls and 36 boys) whose families participated at least once during Wave 5 (37.81 ± 1.03 months), Wave 6 (60.32 ± 0.74 months), or Wave 7 (83.58 ± 2.12 months). The attrition analyses revealed that, compared with those who were omitted due to attrition ($n = 35$; 11 girls and 24 boys), the included sample had a higher maternal education status ($z = 2.64$, $p = .01$) and a different gender ratio, $\chi^2(1) = 7.67$, $p = .01$. No differences were found on paternal education status, parental monthly income, and parental ages. The 88 children and their families were also mainly from the highly educated population in Beijing.

Measures

Maternal parenting behaviors at 38 months. An event sampling and episodic coding system was used to code maternal parenting behaviors during two 5-min free plays (Liu et al., 2005, 2009). Any verbal (and accompanied nonverbal) behavior was coded if it matched the description of an event. The duration of those behaviors was further coded by every 5-s segment (e.g., the duration of 7 s gets two codes, the duration of 11 s gets three codes). Given reasons similar to those in Study 1, free-play tasks were selected and used in Study 2 as well.

Respect for autonomy refers to those maternal behaviors that encourage the child to initiate and maintain activities or provide choices to the child. Respect for autonomy was coded when the mother used a suggestive (rather than harsh) tone of voice and her verbal behavior met at least one of two criteria (Cheng, Lu, Archer, & Wang, 2018): (a) the mother follows the child's pace and ensures that the child plays an active role in the interaction and (b) the mother intervenes or encourages the child according to the child's state at the moment. *Negative control* refers to those maternal behaviors that discourage or interrupt the child's initiatives and ongoing activities. Negative control was coded when the mother used a coercive tone of voice and the verbal behavior matched one of two criteria (Liu & Guo, 2010): (a) the mother interrupts the child's ongoing activities or physically restricts the child's activities and (b) the mother intervenes in the child's state following the mother's own wishes instead of taking the child's perspective.

After establishing the interrater reliability with an expert based on 15% of the videos ($\kappa = .95$), a coder coded the rest of the videos. Any discrepancies were solved by discussing with the expert. The total frequencies of respect for autonomy and negative control were counted and averaged to each 1 min. In addition, we transcribed maternal conversation during the free plays and calculated the number of words the mothers spoke with her child in each 1 min given that mothers varied considerably in this potentially confounding variable. To rule out the possible confounding effects, the proportions of parenting behaviors were created by dividing the frequency of each behavior in 1 min by the amount of words a mother spoke in 1 min.

Child effortful control at 60 months. *Cool effortful control.* The computerized Silly Sound Stroop-like inhibition task (Willoughby, Blair, Wirth, & Greenberg, 2012) was used to measure cool effortful control. In the practice session, the experimenter presented a picture of a cat and a dog on the left half and right half of the screen, followed by the sound of a cat or a dog. The child was instructed to touch the animal picture matching with the sound to establish predominant responses. Next, the idea was introduced that, in this task, dogs made the sounds of cats and vice versa. Then, children were presented with 18 Stroop-like trials and the accuracy of these trials was used.

Hot effortful control. The delay-of-gratification task (Funder, Block, & Block, 1983) was adapted to measure hot effortful control. The experimenter brought an extremely alluring cake and a small common candy on a serving tray and placed them in front of the child. The child was asked to choose a gift he or she could have, and most children chose the cake by pointing to or naming it. The experimenter asked the child to not touch anything on the tray before she came back; otherwise, she would not give the child the gift. The child was then left alone for a maximum of 15 min (1–900 s) or until he or she touched the cake or candy. The proportion score of the latency to touch was created by dividing the latency by 900.

Child internalization at 60 and 84 months. Internalization of maternal rules. The internalized cleanup task (Kochanska et al., 2001) was used. Similar to Study 1, the child's behavior during every 10-s segment was coded into one of two broad categories: (a) internalized cleanup or (b) oppositional behaviors. In addition, the latency of the first oppositional behavior was recorded using 1-s units (0–300 s). Based on 20% of the videos at each age, the kappa values were .97 between two coders at 60 months and on average .86 among three coders at 84 months.

Internalization of experimenter rules. The “cheating” game task (Kochanska et al., 1996) was administered, which requires the child to internalize the rules conveyed by an experimenter. This ball- or shuttlecock-throwing game taps whether children can follow and take in the prohibitions of the game during the absence of the experimenter. In the practice session, the child had one or two trials of throwing the ball or shuttlecock while facing the target at a close distance. The experimenter tempted the child by “showing” one bin with the wrapped gifts if he or she could hit the target. Next, the experimenter told the child the prohibited behaviors that he or she should not do when playing the game, explained the meaning of the word *cheating*, emphasized that breaking the rules was cheating, and then left the child to play alone for 3 min.

The prohibited cheating behaviors were (a) facing the target, (b) leaving the marked area, (c) throwing with the dominant hand, (d) retrieving the ball(s) or shuttlecock(s) after throwing (five in total), and (e) sticking a ball manually or putting a shuttlecock into the bin manually. Six mutually exclusive codes were these five cheating behaviors and (f) behavior compatible with rules. One code was given for every 3-s segment, and the latency of the first cheating behavior was recorded by 1-s units (0–180 s). Based on 20% of the videos at each age, the kappa values were .91 between two coders at 60 months and on average .92 among three coders at 84 months.

Internalization in everyday life. The mean score of the 20-item internalized conduct scale from the My Child questionnaire (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994) was used to measure children's spontaneous self-correction and compliance without surveillance in daily life. A sample item is “Clearly hesitates before doing something forbidden, even when alone.” Mothers reported on a Likert-type scale, ranging from 1 (*extremely untrue, not at all characteristic*) to 7 (*extremely true, very characteristic*). This scale had good reliability; Cohen's α s were .85 at 60 months and .88 at 84 months.

Data aggregation. Similar to Study 1, all the indicators of the oppositional or cheating behaviors were reverse coded, and then their standardized scores were averaged with the corresponding standardized scores of internalized cleanup or behavior compatible with rules. At both 60 and 84 months, we calculated averaged standardized scores for internalization of maternal or experimenter rules and a standardized score for internalization in everyday life. Next, a principal component analysis (PCA) was applied to these three scores at each wave. At 60 months, two factors were found, with the first factor capturing internalization (eigenvalue = 1.37, 45.6% of the variance, all factor loadings > .56). At 84 months, one factor was found (eigenvalue = 1.20, 40.0% of the variance, all factor loadings > .45). Because the internalization factors at 60 and 84 months were correlated ($r = .47, p < .001$), we standardized and averaged them into one composite.

Results and summary

Preliminary analyses

Preliminary analyses and regression analyses were conducted in Mplus using MLR. Given a non-significant result of Little's MCAR test (Little, 1988), $\chi^2(13) = 7.52, p = .87$, missing data were handled by FIML. The means, standard deviations, and correlations among variables are presented in Table 3. Girls outperformed boys on cool effortful control, $\chi^2(1) = 4.19, p = .04$, Cohen's $d = 0.45$. No gender difference was found on maternal parenting behaviors, hot effortful control, and internalization during childhood. Notably, none of the correlations was significant, although there was a trend for a positive correlation between internalization during childhood and 60-month cool effortful control ($r = .25, p = .06$) and hot effortful control ($r = .21, p = .06$).

Table 3
Means, standard deviations, and correlations among variables in Study 2.

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1 Respect for autonomy, 38 months	76	1.61	0.50					
2 Negative control, 38 months	76	0.10	0.11	.17				
3 Cool effortful control, 60 months	77	0.86	0.15	-.17	-.06			
4 Hot effortful control, 60 months	77	0.60	0.41	.02	.14	.08		
5 Internalization during childhood	81	-.003	0.92	-.12	.10	.25	.21	

Table 4
Cool or hot effortful control at 60 months moderates the relations between 38-month maternal parenting behaviors and child internalization during childhood.

Predictor	Internalization during childhood	
	<i>B</i>	β
Main effects		
Respect for autonomy	-0.14	-.08
Negative control	0.96	.12
Cool effortful control	0.65	.11
Hot effortful control	0.35	.16
Moderation effects		
Respect for Autonomy \times Cool Effortful Control	1.74**	.21 [†]
Respect for Autonomy \times Hot Effortful Control	0.93*	.22*
Negative Control \times Cool Effortful Control	3.92	.08
Negative Control \times Hot Effortful Control	-1.57	-.08
<i>R</i> ²		.21*

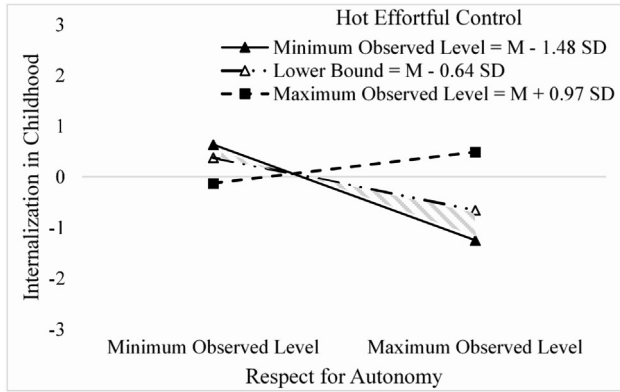
[†] *p* = .05.
* *p* < .05.
** *p* < .01.

Moderation analyses

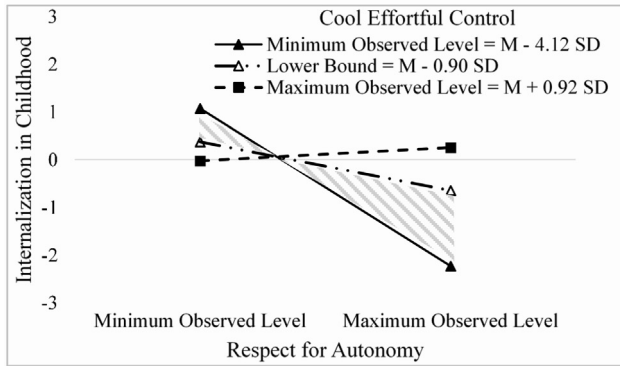
In Table 4, a moderation model is estimated (*N* = 88, *R*² = .21, post hoc power = .93). No direct predictions of maternal parenting behaviors or cool and hot effortful control were found. The interaction of respect for autonomy and hot effortful control predicted internalization during childhood. Further probing this interaction with the region-of-significance technique revealed that for preschoolers with low hot effortful control (from *M* - 1.48 *SD* to *M* - 0.64 *SD*), respect for autonomy was linked negatively with internalization during childhood, whereas for preschoolers with moderate to high hot effortful control (from *M* - 0.64 *SD* to *M* + 0.97 *SD*), this association was not significant (see Fig. 3A). In addition, the interaction of respect for autonomy and cool effortful control predicted internalization during childhood at a marginally significant level (*p* = .05). Similar to hot effortful control, for preschoolers with low cool effortful control (from *M* - 4.12 *SD* to *M* - 0.90 *SD*), respect for autonomy was negatively related to internalization during childhood, whereas for preschoolers with moderate to high cool effortful control (from *M* - 0.90 *SD* to *M* + 0.92 *SD*), no relation was found (see Fig. 3B). Therefore, results indicate the moderation effects by both cool and hot effortful control on the relations between respect for autonomy and child internalization,⁵ and the pattern of both moderations is in line with the goodness-of-fit model.⁶

⁵ Because the sample size was small, we reran the moderation model separately for cool and hot effortful control. The interaction term of Respect for Autonomy \times Hot Effortful Control significantly predicted internalization during childhood (β = .27, *p* < .01). The interaction term of Respect for Autonomy \times Cool Effortful Control also significantly predicted internalization during childhood (β = .26, *p* = .03).

⁶ The *Pol* for the respect for autonomy-by-cool effortful control interaction is 0.01 (crossover point = -0.17), and the *Pol* for the respect for autonomy-by-hot effortful control interaction is 0.31 (crossover point = -0.32), both of which do not meet the requirement of the differential susceptibility model (Roisman et al., 2012).



a



b

Fig. 3. Effortful control at 60 months moderates the association between 38-month maternal respect for autonomy and internalization during childhood. The regions-of-significance analyses are based on the observed ranges of hot effortful control (A) and cool effortful control (B). The stripe-shaded areas illustrate the significant region representing a negative relation between respect for autonomy and internalization when effortful control is low.

Summary

In Study 2, we examined how maternal parenting behaviors and child effortful control during the preschool years predicted internalization across the preschool to school years. Consistent with the results in Study 1, no main effects were shown for the two parenting behaviors, whereas interactions between respect for autonomy and child effortful control significantly predicted later internalization. Again, the moderations in Study 2 did not meet the requirement of the differential susceptibility model. Instead, the findings are in line with the pattern of a goodness-of-fit model given that children with low effortful control showed lower, instead of higher, internalization when maternal respect for autonomy increased, whereas the association between respect for autonomy and child internalization was not significant for children with high effortful control. Cool and hot effortful control during the preschool years were found to yield a similar moderation effect on the relation between respect for autonomy and child internalization, suggesting that both dimensions of effortful control matter for later internalization when they are at a similar developmental level.

For preschoolers low on either cool or hot effortful control, respect for autonomy was negatively associated with later internalization, whereas for preschoolers with moderate to high effortful control, no associations were found. A possible explanation is that preschoolers with low effortful control lack sufficient self-control to appropriately regulate impulsivities and emotions and, thus, might depend

more on maternal external control than on their own self-regulation for internalization. Respect for autonomy negatively predicted their internalization, which might indicate a lack of fit between their temperamental trait and parenting behaviors (Kiff et al., 2011). Comparable results have also been found among adolescent boys in regard to their rule-breaking behaviors (Houtepen et al., 2019).

General discussion

Drawn from two longitudinal samples of Chinese mother–child dyads, this investigation reveals how parenting behaviors and child effortful control foretell later internalization throughout early to middle childhood. Although no direct prediction from maternal parenting behaviors or child effortful control to internalization development was found, several respect for autonomy-by-effortful control interactions were predictive of this development. During toddlerhood, cool effortful control modified the link between respect for autonomy and later internalization. During the preschool to school years, both cool and hot effortful control modified the links between respect for autonomy and later internalization. Therefore, together with previous studies with U.S. children (Augustine & Stifter, 2015; Kochanska & Kim, 2014), a parenting-by-temperament process of internalization development is supported across the two studies reported here, suggesting that such process may commonly apply to children from Western and non-Western cultures.

Yet given the specific conditions on which significant interactions are shown, the current research reveals some specificities related to this parenting-by-temperament process. First, we found age differences for cool and hot effortful control as to when they affect the association between respect for autonomy and child internalization. Although the interplay between respect for autonomy and cool effortful control could already foretell internalization development during toddlerhood, the interplay with hot effortful control is not predictive of internalization until the preschool years. Thus, the developmental relevance of hot effortful control to internalization might reach its maximum following cool effortful control, which is in line with past results (Simpson & Carroll, 2019; Zelazo & Carlson, 2012). In addition, correlations between cool and hot effortful control were low in both studies, which may suggest that these two dimensions of effortful control are less coherent during early childhood. This is in line with the theoretical justification that these two tasks demand inhibitory strength and endurance in counter directions and that these dimensions represent two unique aspects of effortful control (Simpson & Carroll, 2019). Therefore, our findings indicate the importance of disentangling various dimensions of effortful control because they might be differentially connected to internalization during varied developmental phases.

Second, moderations by effortful control between the two studies are compatible with a contrastive effect (Belsky et al., 2007; Leerkes, Blankson, & O'Brien, 2009), in which the significant associations between respect for autonomy and internalization were in opposite directions for children with varying levels of effortful control. This result is possibly related to the developmental process of effortful control from toddlerhood (Study 1) to the preschool years (Study 2). During toddlerhood, although most children are not developmentally mature to internalize external rules, toddlers with high effortful control are already cognitively prepared for being scaffolded. Thus, maternal respect for autonomy could foster their internalization by allowing them to establish self-endorsement of maternal values and rules (Grolnick et al., 1997).

During the preschool years, effortful control develops dramatically, with most preschoolers being able to use top-down control over their behaviors and regulate their impulsivities making them more likely to follow adults' rules. As a result, maternal respect for autonomy during the preschool years may no longer facilitate internalization development during middle childhood. Rather, preschoolers low on effortful control may require maternal behavioral corrections and limit setting to help them achieve the same level of internalization as their peers. If mothers only support their independence and autonomy, these preschoolers might not be able to comply with adults' rules when out of surveillance or might even exhibit rule-breaking behaviors (Houtepen et al., 2019).

These specific results in the current research suggest that how effortful control moderates the association between positive parenting (i.e., respect for autonomy) and positive outcomes (i.e., internalization) may depend on *how* effortful control is measured (cool vs. hot), *when* effortful control is

measured (toddlers vs. preschoolers), and *what* sociocultural backgrounds children are from (non-Western vs. Western). Given those specific conditions, we found partial support for a goodness-of-fit model as to how respect for autonomy combines with child effortful control to predict later internalization. This is consistent with the result in a recent meta-analysis that effortful control is not a marker of differential susceptibility (Slagt, Dubas, Deković, et al., 2016), although more replication studies are needed to confirm the current findings.

Unexpectedly, negative control did not play any roles in internalization development. This result is inconsistent with previous studies (e.g., Kochanska et al., 2003; Yu et al., 2018). From a developmental perspective, a possible explanation is that negative control might predict child internalization when combined with other temperamental and behavioral traits (e.g., fearfulness; Kochanska et al., 2001). Another interpretation is related to sample characteristics. Because the participating families were mainly from the highly educated urban population of China, it is easier to foster a positive mother-child relationship in these families. Maternal negative control was generally in mild forms, and children from these families were more likely to hold a relatively benign interpretation about their mothers' occasional negative control as caring and reflecting involvement (Pomerantz & Wang, 2009). Thus, this parenting behavior may, on the one hand, thwart the thriving for independence and autonomy yet, on the other hand, fulfill the need for closeness and relatedness. As a result, a compensatory process exists, and its association with child internalization is nonsignificant.

Moreover, this result might be culture specific, bringing up the issue about how to understand parental control in contemporary China with the dramatic transformation of Chinese society during the past 40 years. Derived from the Confucianism ideology, we expected that Chinese mothers would raise their children to take in standards of conduct in a controlling manner. But descriptive data showed that, compared with respect for autonomy, mothers did not display a higher level of negative control during toddlerhood and used much fewer negatively controlling behaviors during the preschool years. Thus, it is possible that negative control may be less developmentally relevant to child internalization owing to the culturally decreasing acceptance of teaching children to comply with adults' rules through thwarting children's autonomy and independence.

In addition, the associations between respect for autonomy and negative control were not congruent across the two studies, possibly because different coding schemes were used. This result adds to the current discussion about the differences of parenting behaviors in micro-level coding and macro-level coding (see Mesman, 2010). Micro-level coding may capture these two parenting behaviors irrespective of child behaviors more possibly because this approach uses a predefined set of behaviors and is relatively neutral. Thus, they reflect two independent dimensions of parenting, and they are less likely to be correlated (see also Laurin & Joussemet, 2017). In macro-level coding, those behaviors are coded with a consideration of a wider range of contextual cues and dynamics of parent-child interactions. As a result, they shared the overlapping contents of child responses and tended to be negatively correlated.

Based on the current findings, there are several future directions. First, research on the parenting-by-effortful control interactions has been scarce in general (see Slagt, Dubas, Deković, et al., 2016, for a review). Future studies are called for to advance understanding the moderation effect by effortful control on the association between parenting and moral development. Second, because cool and hot effortful control are found to play differential roles during varied developmental periods, future research needs to take child age into account when examining how cool or hot effortful control predicts moral development. Third, further examining the links between respect for autonomy or negative control and socialization goals or parenting attitudes could help to advance understanding the functional meanings of those parenting behaviors in the current Chinese social context. Fourth, parenting behaviors coded from the free-play task do not directly relate to child internalization, possibly because respect for autonomy and negative control in different contexts (e.g., the teaching context vs. the free-play context) are differentially associated with child development and these parenting behaviors coded from free plays tend to be less developmentally relevant (Matte-Gagné, Harvey, Stack, & Serbin, 2015). Future studies are needed that use diverse contexts to measure and reveal the "contextual specificity" of these two parenting behaviors. Relatedly, future research may also consider examining whether similar patterns of predictions would be found for different forms of internalization (e.g., observed internalization of rules vs. parent-reported internalization in everyday life).

This research has limitations. First, we used only one task to measure cool and hot effortful control. More tasks for a comprehensive assessment of effortful control are needed in future studies. Second, most families were from urban China with a relatively high educational background and financial security. A more representative sample is required to generalize the current findings. For example, a sample including parent–child dyads from rural areas of China may be particularly helpful for clarifying our different assumptions of the developmental relevance of parental negative control in contemporary Chinese families.

Conclusion

This study demonstrates a complex parenting-by-temperament process of internalization development. We found that during toddlerhood maternal respect for autonomy positively predicts later internalization for toddlers high on cool effortful control. During the preschool to school years, maternal respect for autonomy negatively predicts later internalization for preschoolers low on either cool or hot effortful control. Together, these results add to our understanding of how socialization factors combine with child individual factors to shape moral development throughout the first 7 years of life.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jecp.2021.105099>.

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