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Perceived parenting styles, cognitive flexibility, and prosocial behavior in Chinese Youth with an immigrant background: A three-group comparison

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Abstract

Previous research has revealed cross-cultural differences in parenting styles and in how these may relate to adolescents' prosocial behavior. Nevertheless, little is known about the role of cognitive flexibility – a key component of executive function –and the immigration context in these associations. Using a person-centered approach, the current study aimed to (1) explore perceived parenting profiles among Chinese immigrant-origin youth in Italy in comparison to their nonimmigrant ethnic majority peers in the country of origin (China) and in the country of destination (Italy), and (2) examine the moderating role of cognitive flexibility in the expected parenting-prosocial behavior link in the three cultural groups. Participants ($N = 444$; $M_{(Age)} = 11.88$ years; $SD = 1.08$; 50.7% girls; 27.4% Chinese immigrant-origin, 35.4% Chinese ethnic majority; 37.2% Italian ethnic majority) completed a parenting questionnaire and a computerized cognitive flexibility task, while teachers rated their prosocial behavior. Latent profile analysis revealed three perceived parenting styles: "harsh" (15.8%), "supportive" (40.5%), and "strict-affectionate" (43.7%). Chinese immigrant-origin, Italian ethnic majority, and Chinese ethnic majority youths were overrepresented in each of these profiles, respectively. In regression analyses, the association between parenting profiles and prosocial behavior varied as a function of adolescents' cognitive flexibility and cultural group. Specifically, cognitive flexibility strengthened the supportive parenting-prosocial behavior link for Chinese immigrant-origin youth, and buffered against the detrimental effect of harsh parenting on prosocial behavior for their Italian ethnic majority peers. Findings emphasize the influence of cultural and immigration-related factors on adolescents' perceived parenting styles, and provide further evidence for the beneficial role of cognitive flexibility in the positive adjustment of youth with and without an immigrant background.

Keywords Prosocial behavior · Parenting styles · Cognitive flexibility · Early adolescence · Immigration

Prosocial behavior refers to all voluntary behaviors intended to benefit others (Eisenberg et al., 2006) and plays a key role in adolescents' psychosocial adjustment, as it facilitates optimal functioning in terms of well-being (Snippe et al., 2018), social competence with peers (Caputi et al., 2012), and academic achievement (Gerbino et al., 2018). Moreover, prosocial behavior has been found to mitigate internalizing and externalizing problems (Flouri & Sarmadi, 2016).

However, less empirical work has focused on prosocial behavior during early adolescence, a developmental period in which individuals manage school transitions, strive for autonomy from the family, and achieve a more faceted sense of self (Carlo et al., 2003). Furthermore, most studies have been conducted on racial- or ethnic-majority populations living in Western societies (Amir & McAuliffe, 2020), resulting in a limited understanding of whether and how cultural and immigration processes may impact prosocial behavior manifestation in early adolescence. Given the significance of prosocial behavior for psychological well-being in adolescence and beyond (Snippe et al., 2018), it is vital to understand the conditions underpinning individuals' tendency to

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engage in prosocial activities, promoting culturally sensitive psychoeducational activities targeting youths' motivation to help and share with others.

Following a socioecological resilience-oriented framework (Bronfenbrenner & Morris, 2006; Motti-Stefanidi & Masten, 2017), this study aimed to investigate the contributions of proximal factors (i.e., parenting styles) and individual characteristics (i.e., cognitive flexibility) to early adolescents' prosocial behavior. Specifically, I used a person-centered approach to derive parenting profiles and examined whether cognitive flexibility moderated the expected associations between emerging parenting profiles and prosocial behavior. This assessment was based on prior evidence suggesting that individuals' shifting ability can facilitate their engagement in prosocial activities (Miconi et al., 2019). In doing so, I compared Chinese immigrant-origin early adolescents in Italy with Chinese nonimmigrant ethnic majority peers in their country of origin (China) and Italian nonimmigrant ethnic majority peers in the country of destination (Italy). This comparison sheds light on the role of culture and immigration context in the association between parenting styles and prosocial behavior. According to recent conceptualizations (see Bornstein, 2017a, b), this research design allows scholars to distinguish cultural variations in parenting styles and their associations with prosocial behavior and to gain novel insight into the acculturation process (see also Berry et al., 1988; Cote et al., 2015).

Parenting and Adolescents' Prosocial Behavior

As suggested by the socioecological framework (Bronfenbrenner & Morris, 2006), parents are one of the most proximal socialization agents in adolescent development across interdependent and independent-oriented cultural contexts (Pastorelli et al., 2016). Parenting styles are determined by the extent to which a parent emphasizes the dimensions of responsiveness (amount of warmth and attention the parent gives to his or her children) and demandingness (how much control the parent places on his or her children's behavior; Baumrind, 1989). Among existing Western theories, Baumrind' s (1989) authoritative-authoritarian parenting framework addresses parenting in terms of child-supportive (e.g., being warm and responsive) versus child-restrictive (e.g., being controlling and punitive) behaviors on the part of the parents.

Prior research suggests that parenting dimensions are related to adolescents' prosocial behavior (Laible et al., 2017; Spinrad & Gal, 2018). In particular, parental warmth is more likely to facilitate positive parent–child relationships through affection and cooperative interactions; likewise, warm and supportive parenting promotes better self-regulatory skills through children's internalization of parental values, facilitates sensitivity to prosocial and moral values, and fosters adolescents' responsivity to others' needs (Carlo et al., 2011; Ngai et al., 2018). With regard to parental control, the empirical evidence is less clear-cut. For instance, previous research conducted in Western contexts indicates that parents who exhibit relatively high levels of control tend to focus on themselves rather than on their children's perspective, therefore often leading to emotional and behavioral dysregulation in their offspring. Consequently, parental control has been linked to less prosocial tendencies (Richaud et al., 2013). However, in collectivistic cultures such as China, children may react less negatively to parental control than their Western peers (Chen, 2010). This pattern has been attributed to the fact that Chinese parents emphasize filial piety, and children are socialized to meet their parents' expectations and rules in line with Confucian values (Chao, 1994). In particular, Chinese parents highlight the importance of self-discipline, sacrifice, and obedience, but also underscore high involvement (Chao, 1994; Wang et al., 2022).

To date, most quantitative studies have relied on a traditional, variable-centered approach (in which average scores are aggregated across individuals) to study the association of distinct parental dimensions with adolescents' prosocial development. Built upon the assumption that the population is homogeneous, the variable-centered approach fails to consider that adolescents may simultaneously perceive a distinct degree of parental warmth and control, making it challenging to obtain a holistic perspective of parenting styles based on their natural configurations (Bergman et al., 2006; Feng & Lan, 2020; Lan et al., 2021). Due to these inherently methodological limitations, some scholars argue that research should be augmented with a person-centered (typological) approach, assuming that there exist numerous unobserved subgroups within a certain population (Bergman et al., 2006; Crockett et al., 2006). A person-centered approach relaxes the assumption of homogeneity in the population by concentrating on characterizing subgroups of individuals who exhibit a distinct set of parameters and values for certain variables (Mäkikangas et al., 2018; Muthén & Muthén, 2000), which should be more reflective of real-life conditions than a variable-centered approach. Indeed, a person-centered approach allows researchers to simultaneously encompass multiple parenting dimensions (e.g., warmth and control) and examine any potential discrepancy across paternal and maternal parenting, providing a more comprehensive understanding of variations in these parental styles. In addition, the optimal number of groups is evaluated and compared based on fit statistics, interpretability, and theoretical considerations, often resulting in more valid and reliable grouping solutions (Zhang et al., 2017). Hence, I used a person-centered approach (i.e., latent profile analysis) to explore how the dimensions of warmth and control

are combined to yield different parenting profiles in the three cultural groups, and examined how specific parenting profiles are related to early adolescents' prosocial behavior, building on previous research in this area (e.g., Bowers et al., 2014; Kim et al., 2013b; Zhang et al., 2017).

Moreover, based on recent studies highlighting the importance of executive functions in moderating the effect of environmental factors, including parenting, on adolescents' psychosocial outcomes (Miconi et al., 2019; Rabinowitz et al., 2016), I investigated whether cognitive flexibility interacted with the emerging parenting profiles to explain levels of prosocial behavior in these early adolescents, as discussed next.

Cognitive Flexibility

Cognitive flexibility refers to one's ability to appropriately adjust behavior according to a changing environment and represents a key component of executive functions (Diamond, 2013). It becomes increasingly salient during early adolescence, since youth are presented with new opportunities (e.g., school transition), which require higher levels of autonomous self-regulation and shifting ability to adapt to more complex situational demands (Miconi et al., 2019). Previous research indicates that cognitive flexibility is associated with favorable outcomes throughout the lifespan, comprising prosocial tendencies and moral reasoning (Bock et al., 2015; Vera-Estay et al., 2015). Indeed, the ability to make simultaneous judgments along multiple perspectives (e.g., my view vs. your view) and to sequentially shift between these distinctions (e.g., thinking about others' rather than one's own desires) is critical for making use of beliefs and desires in everyday interactions, which may benefit others (Bock et al., 2015).

Recent studies suggest that, beyond its direct associations with positive outcomes, cognitive flexibility moderates the impact of contextual factors, such as parenting, on adolescents' adjustment. For example, Rabinowitz et al. (2016) found that in a US sample, lower (vs. higher) levels of paternal positive parenting were associated with more internalizing and externalizing symptoms among less flexible adolescents, whereas symptom levels were similar irrespective of levels of paternal positive parenting among more flexible adolescents. Furthermore, several studies found that cognitive flexibility served as a protective factor among high-risk youth, enabling them to succeed in the context of severe adversity due to their ability to view potential stressors from a new and positive perspective (see Blair & Raver, 2012; Motti-Stefanidi & Masten, 2017). Of relevance to this study, Miconi et al. (2019) reported that cognitive flexibility strengthened the positive association between an interdependent self-construal and social competence among early adolescents with an immigrant background, supporting the view that better cognitive flexibility boosts immigrant adolescents' capacity to balance and integrate different perspectives, therefore resulting in improved social skills (Fuligni & Tsai, 2015).

Despite this initial evidence, knowledge concerning the role of cognitive flexibility in early adolescents' prosocial behavior is still limited, especially from a cross-cultural perspective. This knowledge gap is striking, considering that distinct socialization goals and cultural values affect child-rearing practices and, consequently, youths' cognitive capacities (Schirmbeck et al., 2020). Furthermore, although converging research indicates that cognitive flexibility is more important in the context of the different cultural and social norms linked to migration backgrounds (Ahn et al., 2008; Fuligni & Tsai, 2015), it is still inadequately understood whether cognitive flexibility develops universally across diverse cultures or is a culturally constructed capacity varying between different cultural populations (Barrett, 2020; Legare et al., 2018). Thus, the extent to which cognitive flexibility may moderate the association between perceived parenting and prosocial behavior in different cultural groups warrants further investigation.

Cultural Groups

In the present research, I used a three-group comparison to highlight the role of culture and immigration context in patterns of associations among perceived parenting, cognitive flexibility, and youths' prosocial behavior. Specifically, I focused on Chinese early adolescents with an immigrant background by comparing them with their nonimmigrant ethnic majority peers in the country of origin (China) and in the country of destination (Italy). Statistically, I regarded the cultural group as a moderator when examining the associations under investigation by leveraging the entire sample rather than treating cultural groups independently (Davidov, 2021). Employing this three-group comparison to examine the associations of parenting profiles, cognitive flexibility, and prosocial behavior has important theoretical and practical implications for a more comprehensive understanding of socialization and acculturation processes. At the theoretical level, the current study may not only add to extant research documenting the correlations of prosocial behavior, but it may also explain the conditional processes and cultural boundaries underlying the direct and interactive associations of parenting profiles and cognitive flexibility with prosocial behavior. At the practical level, leveraging this three-group comparison to determine whether the investigated associations have a universal or culture-specific pattern (see Berry et al., 1988; Bornstein, 2017a, b) would gain important insights into designing more culturally sensitive intervention

and prevention programs for early adolescents. For instance, parenting dimensions and cognitive flexibility may serve as targeted factors to enhance prosocial tendencies hinged on specific socialization goals and normative practices.

In the current study, I selected Chinese and Italian samples because they differ in important aspects related to parenting and social relationships (Lan, 2022). In the subsequent paragraphs, I elaborated on socialization goals and parenting practices with regard to Chinese cultural context, Italian cultural context and, ultimately, Chinese immigrants in Italian society. Chinese culture traditionally places a strong emphasis on collectivism, interdependence, and group harmony (Chen, 2010). Despite the extreme sociocultural changes and rapid economic growth that have taken place in the past decades (Tseng & Wu, 2013), family relationships are still perceived as essential in China. Children are socialized to regard the closely-knit family as the center of Chinese culture (Tseng & Wu, 2013). Moreover, a major parental socialization goal is to help children develop cooperative skills and behaviors that may promote group well-being. In this regard, the emphasis on group interests can have implications for the development of prosocial behavior, since prosocial tendencies are conducive to interdependence and group harmony (Main et al., 2017). Although traditional values (e.g., parental authority, self-discipline, and hard work; Chao, 1994) are common for many contemporary Chinese families, emotional expressiveness and involvement have become increasingly valued in recent years due to social change, modernization, and greater parental educational level (Zhang et al., 2017).

As a typical Western-European cultural context, Italian society highlights individual autonomy and group welfare. However, the country is marked by large regional differences in terms of the individualism/independence and collectivism/interdependence dimensions (Bornstein et al., 2001). Indeed, Northern Italians tend to be more self-oriented, giving considerable importance to personal development and autonomy, whereas group affiliation and interpersonal harmony tend to be regarded as more important in Southern Italy (Chen et al., 2004; Lo Cricchio et al., 2019). Yet, a shared socialization goal is related to the acquisition of social skills in terms of assertiveness, social initiative, and sociability, which are encouraged from early on as these aspects are viewed as a major index of social maturity (Chen, 2010). Italian parents consider their children to be independent beings, and highly value the open expression of emotional states as well as the manifestation of mutual affection and responsiveness in the family context (Claes et al., 2003; Harkness et al., 2006).

Chinese immigrants are the third largest ethnic community in Italy, which currently hosts over 5 million legally residing immigrants from over 200 different countries (ISTAT, 2019). Unlike the Chinese diaspora in other Western contexts, the vast majority of Chinese immigrants in Italy originates from the same prefecture, namely Zhejiang Province in Mainland China (Ceccagno, 2017). Chinese residents often run entrepreneurial activities (e.g., garment production) and small family businesses (e.g., shops, bars, and services). Most of these families have a low educational background and little intercultural contact with Italian majority members. However, there is some initial indication that these Chinese immigrant parents strongly encourage their children to learn the Italian language and to academically engage in school; moreover, they expect their children to retain Chinese culture and traditions by attending Chinese after-school programs to interact with Chinese community members and learn Chinese language (Ceccagno, 2017). Drawing from the literature on Chinese immigrants in other Western contexts, the experience of immigration-related stress and low social support likely impacts parental practices; for instance, Chinese immigrant parents have been found to exhibit less involvement and responsiveness toward their children and to increase their expressions of control (Leinonen et al., 2003; Miao et al., 2018), especially in situations of socioeconomic hardship. Past research on Chinese immigrants in Western contexts has a narrow reliance on the samples in North America (Chen & Zhou, 2019; Miao et al., 2018), whereas little is known about Chinese immigrants in European societies of settlement. Thus, understanding parenting profiles and their associations with early adolescents' prosocial behavior among Chinese immigrant families in Italy is an important contribution to the current scarce literature on the Chinese diaspora's adaptation patterns in the European context.

The Present Study

The present study had two main goals. First, I used a person-centered approach to identify parenting profiles based on early adolescents' accounts and to examine possible variations in parenting profiles in the three cultural groups: Chinese immigrant-origin youth in Italy, nonimmigrant Chinese ethnic majority youth in China, and nonimmigrant Italian ethnic majority youth in Italy. I focused on two major parental dimensions, namely warmth and control, since they have been shown to be crucial for distinguishing among parenting styles (Zhang et al., 2017). Given the lack of studies assessing perceived parenting in Chinese early adolescents of immigrant background in comparison with their counterparts in the societies of origin and settlement, I did not formulate any hypothesis concerning the number and type of possible profiles. However, based on prior research on parenting styles (Bowers et al., 2014; Kim et al., 2013a, b; Zhang et al., 2017), it was reasonable to expect the presence of at least three profiles – one characterized by overall high

levels of warmth and low levels of control, one by overall high levels of control and low warmth, and another by high (or low) levels of both warmth and control.

Second, I examined the direct and interactive effects of parenting profiles and cognitive flexibility on teacher-rated prosocial behavior (2-way interactions), and how these associations varied as a function of cultural group (3-way interactions). Building on the available evidence (Rabinowitz et al., 2016), I anticipated that increased cognitive flexibility would strengthen the association between an overall "positive" parenting profile and teacher-rated prosocial behavior, and buffer the effect of an overall "negative" parenting profile on prosocial behavior. Moreover, since immigrant youth are continuously exposed to different cultural codes (Fuligni & Tsai, 2015), I expected that the possible moderating effect of cognitive flexibility would be more pronounced in Chinese immigrant-origin youth in comparison to nonimmigrant early adolescents in both China and Italy.

In this study, I also controlled for participants' age, gender, and family socioeconomic status (SES) as these variables have been shown to influence prosocial behavior. In particular, previous research indicates that being younger, being female, and having a high SES are related to increased prosocial behavior (Luengo Kanacri et al., 2017; Van der Graaff et al., 2018). Furthermore, because there is evidence that nonverbal intelligence is linked to cognitive flexibility (Arffa, 2007), I also controlled for its potential effect in the statistical analyses.

Method

Participants

Participants were early adolescents aged between 11 and 14 years with a Chinese immigrant ($n = 122$, 38.5% girls), Chinese nonimmigrant ethnic majority ($n = 157$, 54.1% girls), and Italian nonimmigrant ethnic majority background ($n = 165$, 56.4% girls) together with their teachers. Participants' mean age was 11.96 years ($SD = 1.22$), 12.22 years ($SD = 0.93$), and 11.49 years ($SD = 0.98$) in each of the three groups, respectively. All Italian students were born in Italy from Italian-born parents. All Chinese immigrant parents were first-generation (i.e., born in China); about one-third (32.8%) of the Chinese immigrant students were first-generation (i.e., born in China) and had been residing in Italy for an average of 8 years (range = 1–14 years, $SD = 3.47$), whereas the remaining youth were second-generation (i.e., born in Italy). Consistent with national figures concerning immigrant-origin youth in Italy (ISTAT, 2020; NBS, 2019), preliminary analyses revealed a significant effect of cultural group on family SES (assessed via the Family Affluence Scale, see measures section), $F(2, 437) = 30.92$, $p < 0.001$. Specifically, Chinese adolescents from immigrant families were less wealthy than their nonimmigrant ethnic majority peers in Italy, but they did not significantly differ from their nonimmigrant ethnic majority counterparts in China.

Procedure

Data were collected in both countries between April 2018 and June 2019 by establishing partnerships with local schools and after-school programs. Chinese immigrant-origin youth and their Italian nonimmigrant peers were recruited in the same public middle schools located in northern Italy, an industrial region which hosts a large number of immigrant communities (ISTAT, 2020). Chinese ethnic majority early adolescents were recruited from public schools located in Zhejiang Province, a geographical area from which most Chinese immigrants in Italy originate from (Chang, 2012), therefore ensuring more homogeneity in terms of sociocultural and economic backgrounds between the two Chinese samples. After obtaining approval from school principals or coordinators, a letter was sent to parents to explain the purpose of the current study. Written consent was obtained from both parents, and verbal assent was obtained from each adolescent. Overall, participation rates were 89.2%, 95%, and 82.5% for Chinese immigrant-origin, Chinese nonimmigrant ethnic majority, and Italian nonimmigrant ethnic majority samples, respectively.

Assessments were conducted at school (or in after-school settings) by the author together with trained research assistants. In the first session, participants completed a set of questionnaires in the classroom; in the second session (within 1 week), they were individually administered a computerized cognitive flexibility task. All questionnaires and verbal instructions that had not been previously validated in one of the target languages (i.e., Mandarin and Italian) were translated, back-translated, and piloted following the procedures recommended by Van de Vijver and Leung (1997). At the end of the session, adolescents received a stationary gift and a certificate to thank them for their participation. The study protocol and procedures were approved by the Ethics Committee of the School of Psychology, University of Padova.

Measures

Prosocial Behavior

Teachers were asked to complete the prosocial behavior subscale of the teacher-rated version of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Prosocial behavior subscale contains five items (e.g., "This student is considerate of other people's feelings.") rated on a 3-point

Likert scale ranging from 0 (*not true*) to 2 (*absolutely true*). Items of this subscale are summed to yield a total score, with higher scores indicating more prosocial behavior. The prosocial behavior subscale has been validated in both Chinese and Italian adolescent populations, showing good psychometric properties (Lai et al., 2010; Tobia et al., 2013). In the present study, Cronbach alphas were 0.70, 0.77, and 0.80 for Chinese immigrant-origin, Chinese ethnic majority, and Italian ethnic majority early adolescents, respectively.

Perceived Parenting

Early adolescents' perception of parenting was measured using the Parenting Inventory developed by Stewart et al. (1998), which was adapted for Chinese youth by Gao et al. (2015). The inventory includes 10 items (4 items for warmth and 6 items for control) pertaining to mothers, and 10 items pertaining to fathers. Item examples are, "My father/mother lets me know through words or actions that s/he loves me (paternal/maternal warmth), and "My father/mother is restrictive/controlling of me (paternal/maternal control)." Participants rated each item on a Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Scores related to each parenting dimension were averaged to yield four separate variables: paternal warmth, maternal warmth, paternal control, and maternal control, with higher scores indicating higher levels of perception of warmth or control. Previous research reported good psychometric properties of these subscales for Chinese adolescents (see Gao et al., 2015). In the present study, Cronbach's alphas for each dimension ranged from 0.65 to 0.72, from 0.71 to 0.78, and from 0.71 to 0.82 for Chinese immigrant-origin, Chinese ethnic majority, and Italian ethnic majority early adolescents, respectively.

Cognitive Flexibility

Cognitive flexibility was assessed using the Wisconsin Modified Card Sorting Test (WCST; Nelson, 1976), a widely-used and methodologically sound experimental procedure which consists of a 128-card deck displayed on a computer screen. Participants were provided one deck of cards and asked to match each card, one at a time, to one of four key cards, after which they received feedback from the experimental system PEBL 2.0 automatically (i.e., correct or incorrect). Test cards can be matched with the key cards based on "color" (red, green, blue, or yellow), "form" (triangle, star, cross, or circle), and "number" (1, 2, 3, or 4 shapes on the card), with some cards matching the key cards based on multiple sorting principles (i.e., a test card depicting two blue circles would match a key card depicting two green circles based on both the number and form principles). However, only one of these sorting principles is correct at any given time, and the correct sorting principle changes each time the participant achieves 10 consecutive correct responses (i.e., one completed category). Participants were expected to utilize the system feedback (i.e., correct or incorrect) to learn the correct sorting principle. As such, they matched each of the cards until they had completed all 128 trials. Performance on the task was measured as both accuracy (% correct responses) and reaction time (on correct trials). The median instead of the mean reaction time value was used to reduce the effect of potential outliers. Based on previous research (Miconi et al., 2019), I created a composite index by combining accuracy and reaction time scores. First, I scaled both scores in the same direction, so that higher scores reflected better performance in each variable. Second, I conducted analyses on the average of the standardized scores for the accuracy and reaction time variables, yielding a composite score for cognitive flexibility, with higher scores corresponding to better abilities.

Control Variables

Age, Gender, and Nativity Participants were asked to report on their sociodemographic characteristics including gender, age, and place of birth (for both adolescents and their parents).

Socioeconomic Status Youth completed the FAS (Boyce et al., 2006), a widely used four-item measure of family wealth (i.e., number of owned cars, number of owned computers, youth's own bedroom, frequency of traveling during the past year). Scores across items are summed to provide an overall measure of family wealth, with scores ranging from 0 to 9. I decided to use the Family Affluence Scale, reflecting material conditions as an alternative indicator of family socioeconomic status because conventional indicators of parental educational level and parental occupational status are challenging to collect in young adolescents (Liu et al., 2012; Zou et al., 2018), resulting in a high percentage of missing values.[1] Moreover, it should be mentioned that the Family Affluence Scale has been validated in both Chinese (Liu et al., 2012) and Italian (Vieno et al., 2009) cultural contexts, demonstrating good psychometric properties. In addition, this scale has previously been used in cross-cultural studies between China and Western societies, such as Australia (Guo et al., 2020), Finland (Liu et al., 2013), and Italy (Lan, 2022).

[1] I asked early adolescents in the three cultural groups to report their parents' educational levels and occupations. In accordance with prior research (Liu et al., 2012), they reported a high degree of missing values (46.6% for maternal education, 49.1% for paternal education, 45.7% for maternal occupation, and 44.8% for paternal occupation). Therefore, I have dropped these variables from the current study.

Nonverbal Intelligence Participants were assessed by means of the Culture Fair Intelligence Test –Scale 2 (Cattell & Cattell, 1987), a well-established, nonverbal measure designed to assess analytic and reasoning ability (i.e., fluid intelligence) in children aged between 8 to 13 years; form A was administrated in the current study. It consists of four non-verbal subtests with strict time limits: series (12 items), classifications (14 items), matrices (12 items), and conditions (8 items). Following standardized procedures, the time limit for each subtest was set; on average, the test took approximately 12.5 min to be completed. The total number of correct answers across all subtests yielded the Culture Fair Intelligence Test final score, with higher values indicating higher levels of nonverbal intelligence.

Data Analysis

Data analyses were performed in SPSS 27.0 (IBM Corp., 2019), Mplus 8.0 (Muthén & Muthén, 2017), and R software (R Core Team, 2021). Analytical plan was organized in the following steps: preliminary analyses (e.g., missing values analysis, measurement invariance, descriptive statistics, and bivariate correlations), main analyses (i.e., latent profile analysis and linear regression analysis), and auxiliary analyses (i.e., sensitivity analyses).

In terms of preliminary analyses, the data showed that the percentage of missing values for each variable of interest ranged from 0.01% to 4.40%, from 0.01 to 4.95%, and from 0.01 to 4.82% for Chinese immigrant-origin, Chinese ethnic majority, and Italian ethnic majority youth, respectively. I, therefore, conducted Little's Missing Completely at Random test to evaluate the patterns of missing data. Results showed that the data were missing completely at random, $\chi^2(33) = 30.42$, $p = 0.59$; thus, full-information maximum likelihood estimates were employed to impute missing values (Enders, 2001; Newman, 2014). Subsequently, to establish measurement invariance of questionnaire items in the three cultural groups, I conducted confirmatory factor analyses on all scales using the R package *lavaan* (see Supplemental Material). Additionally, descriptive statistics (means and standard deviations) and bivariate correlations) were computed separately for each cultural group.

With regard to main analyses, a latent profile analysis was conducted in Mplus 8.0 (Muthén & Muthén, 2017) with maximum likelihood estimation to identify potential parenting profiles based on the four parenting scores (two for mother, two for father) obtained from the Parenting Questionnaire. Based on the results concerning measurement invariance, I performed LPA on the whole sample rather than on the three separate groups to secure enough statistical power (Olivera-Aguilar & Rikoon, 2018). One- to five-profile solutions were evaluated and compared based on fit statistics, interpretability, and theoretical considerations to determine the optimal number of latent profiles. An optimal model fit was selected in the context of lower Akaike information criterion (AIC) values, Bayesian information criterion (BIC) values, and adjusted Bayesian information criterion (aBIC) values, as well as higher entropy, a significant bootstrapped likelihood ratio test (BLRT), and a significant Lo-Mendell-Rubin adjusted likelihood ratio test (LMR-LRT; Cui & Lan, 2020; Ma et al., 2019; Nylund et al., 2007). I subsequently conducted a Multivariate Analysis of Variance (MANOVA) using profile membership as the independent variable and maternal warmth, paternal warmth, maternal control, and paternal control as dependent variables to ensure that these emerging profiles are clearly differentiated in terms of the selected variables (see also Datu & Fong, 2018; Lan, 2020). Finally, I conducted a linear regression analysis to examine the moderating role of cognitive flexibility in the expected association between parenting styles and prosocial behavior in the three cultural groups, and follow-up simple slope analyses and corresponding figures were used to interpret significant interaction effects (Aiken & West, 1991).

In terms of auxiliary analyses, I conducted additional statistical analyses to examine whether the main analyses performed and the corresponding results obtained would alter under different, plausible scenarios (i.e., to perform sensitivity analyses). First, there is strong evidence from existing literature showing that family SES is related to parenting styles (Bornstein & Bradley, 2003; Roubinov & Boyce, 2017). I therefore conducted a covariate analysis by adding family SES into the model as one predictor, following the procedure and syntax suggested by Ferguson et al. (2020). Second, a subset of items (e.g., owning a car) in the Family Affluence Scale may exhibit cross-national differences (Torsheim et al., 2016). I standardized the scores obtained from the Family Affluence Scale within each cultural group to permit appropriate cross-national comparisons, and the data were reanalyzed for linear regression analysis using these standardized scores.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics including means, standard deviations for each cultural group.

Table 2 presents the correlations among study variables in each cultural group. As shown in Table 2, in both Chinese immigrant-origin youth and Chinese ethnic majority youth, paternal warmth was significantly and positively related to teacher-rated prosocial behavior.

Table 1 Descriptive statistics of study variables for three cultural groups

Cultural group	MW	PW	MC	PC	CF	PS	Age	Gender [a]	SES	Intelligence
Chinese immigrant-origin ($n=122$)										
M	4.13	3.89	3.34	3.25	.34	6.34	12.0	-	4.89	106
SD	1.05	1.11	1.01	1.06	.75	2.51	1.23	-	2.04	13.3
Range	2–6	1–6	1–6	1–6	-2.48–1.26	0–10	10–14	1–2	0–9	76–153
Chinese ethnic majority ($n=157$)										
M	4.93	4.92	3.27	3.22	-.17	7.70	12.22	-	4.50	104
SD	.84	.79	.96	1.04	.69	1.75	.93	-	2.11	12.11
Range	1–6	2–6	1–6	1–6	-1.82–1.16	2–10	10–13	1–2	0–9	76–135
Italian ethnic majority ($n=165$)										
M	4.91	4.86	2.76	2.57	-.05	6.08	11.5	-	6.13	106
SD	.77	.87	.89	.99	.85	2.67	.99	-	1.64	16.7
Range	2–6	1–6	1–5	1–6	-3.47–1.37	0–10	10–14	1–2	2–9	64–142

[a] coded as 1 = male, 2 = female. MW = maternal warmth, PW = paternal warmth, MC = maternal control, PC = paternal control, CF = cognitive flexibility, PS = prosocial behavior, and SES = socioeconomic status. In accordance with prior research (Miconi et al., 2019), I calculated the scores on cognitive flexibility based on the average of the standardized scores of the accuracy and reaction time. A positive score of cognitive flexibility in Chinese immigrant-origin youth indicated that they showed higher raw scores than the mean. By contrast, negative cognitive-flexibility scores in both Chinese ethnic majority youth and Italian ethnic majority youth revealed relatively lower raw scores than the mean

* $p<.05$, ** $p<.01$, *** $p<.001$

Subsequently, I compared the three cultural groups based on their performance in the cognitive flexibility task. The results of a univariate ANCOVA, controlling for age, gender, family SES, and nonverbal intelligence, were significant, $F(2, 382)=14.91$, $p<0.001$, $\eta_p^2=0.07$. A Bonferroni post hoc analysis indicated that Chinese immigrant-origin youth showed higher levels of cognitive flexibility than their non-immigrant ethnic majority peers in both China and Italy, whereas Chinese ethnic majority youth and Italian ethnic majority youth did not differ in cognitive flexibility.

Identification of Parenting Profiles

A LPA was used to identify parenting profiles in the three cultural groups. Results showed that the LMR-LRT and BLRT values were significant for the two- and three-profile solutions (see Table 3). Compared to the two-profile options, the three-profile option showed better fit statistics (i.e., lower levels of AIC, BIC, and aBIC) and was consistent with extant research on parenting styles (Bowers et al., 2014; Kim et al., 2013b; Zhang et al., 2017). Thus, the three-profile solution was deemed optimal.

To further characterize the three profiles, a MANOVA on four selected variables (i.e., maternal warmth, paternal warmth, maternal control, and paternal control) was conducted, yielding significant differences in all selected variables across the three profiles. The mean differences in each variable are shown in Table 4.

Specifically, early adolescents in the first profile ($n=70$; 15.8%) reported lowest scores on both maternal and paternal warmth and moderate-to-high scores on both maternal and paternal control; thus, this profile was labeled 'harsh'; participants in the second profile ($n=180$; 40.5%) scored highest on both maternal and paternal warmth and lowest on both maternal and paternal control; hence, this profile was labeled 'supportive'; youth in the third profile ($n=194$; 43.7%) scored moderate-to-high on maternal and paternal warmth, and highest on maternal control and paternal control; hence, this profile was labeled 'strict-affectionate'. A graphical representation of the profiles is depicted in Fig. 1.

I subsequently assessed whether being part of one of the three profiles was associated with cultural group. Analyses revealed a significant association, $\chi^2(4)=118.24$, $p<0.001$. Figure 2 presents the percentage of each parenting profile for each cultural group. Specifically, Chinese immigrant-origin youth were more likely to be classified in the "harsh" profile (72.9%), followed by Italian ethnic majority youth in Italy (17.1%) and Chinese ethnic majority youth in China (10.0%). Italian ethnic majority youth were more likely to belong to the "supportive" profile (55.5%), followed by Chinese ethnic majority youth (31.7%) and Chinese immigrant-origin youth (12.8%). In the "strict-affectionate" profile, Chinese ethnic majority youth were more likely to be classified (48.0%), followed by Italian ethnic majority youth (27.3%) and Chinese immigrant-origin youth (24.7%).

Associations among Parenting Styles, Cognitive Flexibility, and Prosocial Behavior

To address the second aim, a linear regression analysis was conducted. In this model, I included perceived parenting style,

Table 2 Correlations among study variables in three cultural groups

Variable	1	2	3	4	5	6	7	8	9	10
Chinese immigrant-origin ($n=122$)										
1.Maternal warmth	-	.56***	-.22*	-.08	-.15	.17	-.01	.12	.20	.32***
2.Paternal warmth		-	.03	-.08	-.05	.21*	.03	.03	.16	.20***
3.Maternal control			-	.52***	.22*	.07	-.11	.08	-.03	-.01
4.Paternal control				-	.17	.05	-.14	-.06	.01	-.05
5.Cognitive flexibility					-	-.01	.22*	-.10	.06	.13
6.Prosocial behavior						-	-.28***	.21*	.14	-.05
7.Age							-	-.27***	.11	-.08
8.Gender [a]								-	-.09	.01
9.Socioeconomic status									-	.04
10. Nonverbal intelligence										-
Chinese ethnic majority ($n=157$)										
1.Maternal warmth	-	.35***	-.13	-.06	.11	.14	-.02	.03	.08	.16*
2.Paternal warmth		-	-.01	-.16*	.11	.18*	-.14	-.09	.19*	.10
3.Maternal control			-	.49***	.01	.08	.03	-.06	-.06	-.04
4.Paternal control				-	.08	-.01	.21**	-.16*	-.03	-.02
5.Cognitive flexibility					-	.12	-.03	-.06	.05	.37***
6.Prosocial behavior						-	-.03	-.02	.10	-.05
7.Age							-	.01	-.32***	-.30***
8.Gender [a]								-	-.11	.01
9.Socioeconomic status									-	.04
10. Nonverbal intelligence										-
Italian ethnic majority ($n=165$)										
1.Maternal warmth	-	.49***	-.33***	-.04	-.03	.11	-.17*	.06	.11	.04
2.Paternal warmth		-	-.17*	-.38***	-.07	.09	-.09	-.11	.02	.02
3.Maternal control			-	.61***	.08	-.12	.02	-.08	-.03	.01
4.Paternal control				-	-.01	-.11	-.05	.01	-.04	.05
5.Cognitive flexibility					-	.06	.33***	.16*	-.03	.23**
6.Prosocial behavior						-	-.40***	-.01	.21*	-.01
7.Age							-	.11	-.23***	-.08
8.Gender [a]								-	-.09	.04
9.Socioeconomic status									-	.09
10. Nonverbal intelligence										-

[a] coded as 1 = male, 2 = female

* $p<.05$, ** $p<.01$, *** $p<.001$

Table 3 Goodness of fit indices for different latent parenting profile analysis

	AIC	BIC	aBIC	Entropy	LMR- LRT	BLRT	Smallest profiles (%)
1-	5071.50	5104.26	5078.88	-	-	-	-
2-	4870.05	4923.30	4882.04	.68	204.72***	211.44***	40.6%
3-	**4732.95**	**4806.68**	**4749.50**	**.73**	**142.47****	**147.09****	**16.9%**
4-	4683.93	4778.13	4705.14	.70	57.15	59.02	12.3%
5-	4636.61	4751.30	4662.44	.76	55.49	57.31	2.9%

$N=444$. AIC = Akaike information criteria, BIC = Bayesian information, aBIC = Adjusted Bayesian information, LMR-LRT = Lo-Mendell-Rubin adjusted likelihood ratio test, BLRT = Bootstrapped likelihood ratio test

** $p<.01$; *** $p<.001$

Boldface values refer to the optimal solution in this study

Table 4 Mean differences in study variables across parenting profiles

	Total sample ($N=444$)		Harsh ($n=70$)		Supportive ($n=180$)		Strict-Affectionate ($n=194$)				
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	Partial η^2	Post hoc
1.Maternal Warmth	4.70	0.94	3.39	0.78	5.12	0.72	4.78	0.74	139.45^{***}	.38	2 > 3 > 1
2.Paternal Warmth	4.61	1.01	2.99	0.84	5.06	0.72	4.78	0.68	213.74^{***}	.49	2 > 3 > 1
3.Maternal Control	3.10	0.98	3.26	0.84	2.25	0.57	3.82	0.67	259.52^{***}	.54	3 > 1 > 2
4.Paternal Control	2.99	1.07	3.31	0.86	2.11	0.69	3.68	0.83	194.51^{***}	.46	3 > 1 > 2

*** $p < .001$

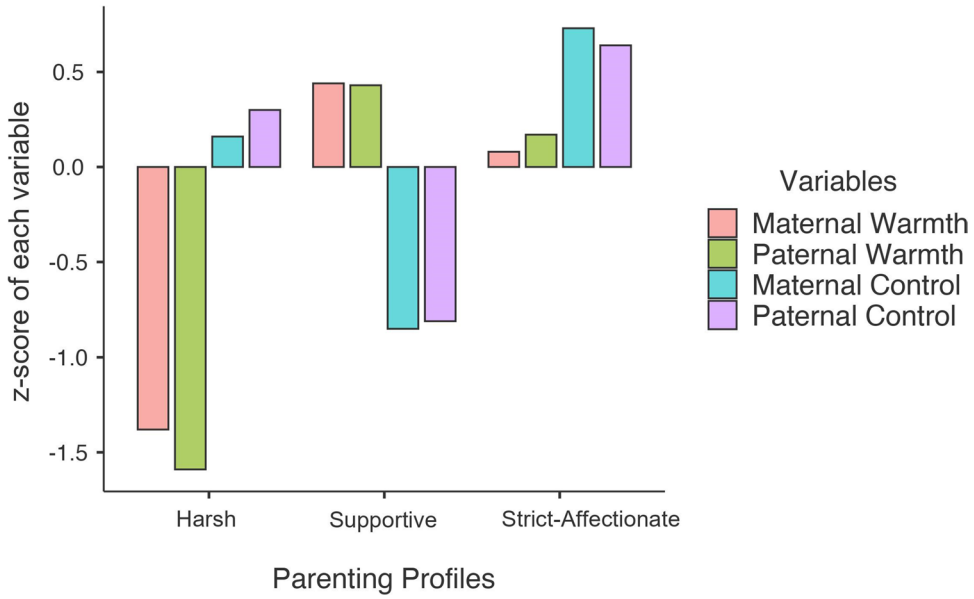

Fig. 1 Three parenting profiles based on z-score of each variable. *Note*. $N=444$

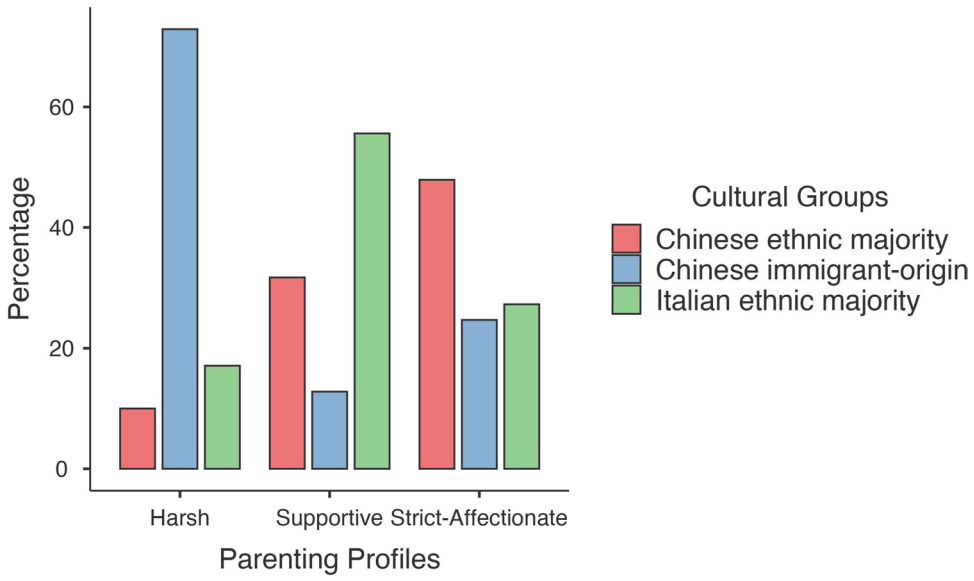

Fig. 2 The percentage of each parenting profile for each cultural group. *Note*. $N=444$

Table 5 Linear regression analysis predicting prosocial behavior

Variable	*B*	*SE*	95% CI for *B*		*t*	*p*
Parenting profiles [a]						
Harsh	-0.82	0.45	-1.69	0.05	-1.84	0.07
Supportive	0.14	0.29	-0.43	0.71	0.47	0.64
Cultural group [b]						
Chinese ethnic majority	1.09	0.42	0.26	1.92	2.58	0.01
Italian ethnic majority	-1.01	0.38	-1.75	-0.27	-2.67	0.01
Cognitive flexibility	0.81	0.22	0.39	1.24	3.73	< .001
Age	-0.60	0.12	-0.82	-0.37	-5.18	< .001
Gender [c]	0.19	0.23	-0.26	0.63	0.82	0.42
Socioeconomic status	0.12	0.06	0.00	0.23	1.99	0.05
Nonverbal intelligence	-0.02	0.01	-0.03	0.00	-2.10	0.04
Parenting profiles x Cultural group						
Harsh x Chinese ethnic majority	0.41	1.11	-1.76	2.58	0.37	0.71
Supportive x Chinese ethnic majority	0.13	0.78	-1.39	1.66	0.17	0.86
Harsh x Italian ethnic majority	1.44	0.93	-0.39	3.26	1.54	0.13
Supportive x Italian ethnic majority	1.06	0.79	-0.48	2.60	1.34	0.18
Parenting profiles x Cognitive flexibility						
Harsh x Cognitive flexibility	0.76	0.57	-0.37	1.88	1.32	0.19
Supportive x Cognitive flexibility	-0.10	0.36	-0.81	0.61	-0.28	0.78
Cultural group x Cognitive flexibility						
Chinese ethnic majority x Cognitive flexibility	-0.05	0.56	-1.15	1.05	-0.09	0.93
Italian ethnic majority x Cognitive flexibility	0.48	0.44	-0.39	1.35	1.09	0.28
Parenting profiles x Cultural group x Cognitive flexibility						
Harsh x Chinese ethnic majority x Cognitive flexibility	1.25	1.48	-1.65	4.16	0.84	0.40
Supportive x Chinese ethnic majority x Cognitive flexibility	-1.23	0.98	-3.16	0.69	-1.26	0.21
Harsh x Italian ethnic majority x Cognitive flexibility	2.11	1.11	0.06	4.29	1.91	0.05
Supportive x Italian ethnic majority x Cognitive flexibility	-2.45	0.95	-4.31	-0.60	-2.59	0.01

$N = 444$. [a] Baseline category for parenting profiles was strict-affectionate. [b] Baseline category for cultural group was Chinese immigrant-origin youth in Italy. [c] Baseline category for gender was male. $R^2 = 25.3\%$

cognitive flexibility, and cultural group as independent variables. To assess potential interactive effects, all two- and three-way interactions between these variables were included in the model. The results of the linear regression analysis are reported in Table 5.

Chinese youth with an immigrant background in Italy were rated by their teachers as being more prosocial than their Italian ethnic majority counterparts, but they were rated as less prosocial than their Chinese ethnic majority peers in China. Moreover, cognitive flexibility was significantly and positively associated with prosocial behavior. No significant main effect of parenting profiles on prosocial behavior was found, and no significant two-way interactions emerged. However, analyses revealed a significant three-way interaction effect of parenting styles, cognitive flexibility, and cultural group on prosocial behavior (F (4, 367) = 16.67, $p < 0.001$, partial $\eta^2 = 0.15$).

Follow-up simple slope analysis showed that high levels of cognitive flexibility strengthened the positive link between supportive parenting and teacher-rated prosocial behavior for Chinese immigrant-origin ($B = 1.85$, $SE = 0.52$, 95% CI = [0.84, 2.86], $t = 3.59$, $p < 0.001$), but not for Italian ethnic majority early adolescents ($B = -0.26$, $SE = 0.56$, 95% CI = [-1.35, 0.83], $t = -0.46$, $p = 0.64$). Furthermore, high levels of cognitive flexibility decreased (i.e., buffered against) the negative association between harsh parenting and prosocial tendencies for Italian ethnic majority adolescents ($B = -1.72$, $SE = 0.57$, 95% CI = [-2.85, -0.60], $t = -3.01$, $p < 0.001$), but not for Chinese immigrant-origin early adolescents ($B = 1.39$, $SE = 1.00$, 95% CI = [-0.56, 3.35], $t = 1.40$, $p = 0.16$; see Fig. 3).[2]

[2] It should be noted that, although counterintuitively, a nonsignificant main effect in regression analysis does not necessarily entail the lack of significantly interactive association between these variables (see also Aiken & West, 1991; Ma et al., 2020). Therefore, while the main effect of parenting profiles on prosocial behavior was nonsignificant, it is statistically reasonable to interpret two significant three-way interactions, according to the results of simple slope analyses and corresponding figures.

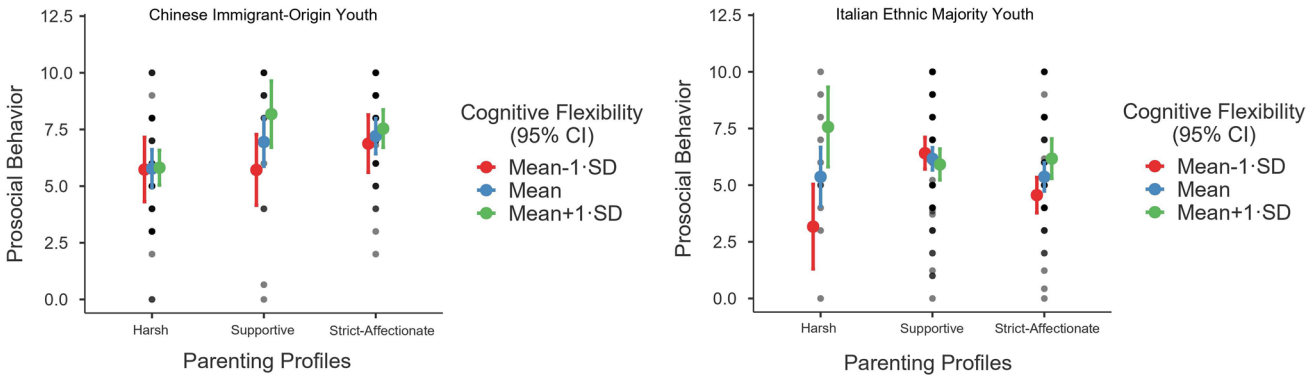

Fig. 3 Interaction effect of parenting profiles, cognitive flexibility, and cultural group on prosocial behavior. *Note*. $N = 444$. Scattered points refer to observed scores, and vertical bars refer to 95% confidence interval. First, simple slope analyses showed that the association between the "supportive" parenting profile and prosocial behavior significantly varied by different levels of cognitive flexibility in Chinese immigrant-origin, as indicated by a significant *p*-value ($B = 1.85$, $SE = 0.52$, 95% CI = [0.84, 2.86], $t = 3.59$, $p < .001$). Subsequently, a positive unstandardized coefficient indicated a positive association between the "supportive" parenting profile and prosocial behavior for Chinese immigrant-origin youth. In addition, as shown in Fig. 3, Chinese immigrant-origin youth with higher levels of cognitive flexibility ($M + 1SD$) showed higher levels of prosocial behavior than those with lower levels of cognitive flexibility (M-$1SD$). Thus, high levels of cognitive flexibility strengthened the positive link between supportive parenting and teacher-rated prosocial behavior for Chinese immigrant-origin youth. Second, simple slope analyses showed that the association between the "harsh" parenting profile and prosocial behavior significantly varied by different levels of cognitive flexibility in Italian ethnic majority youth, as indicated by a significant *p*-value ($B = -1.72$, $SE = 0.57$, 95% CI = [-2.85, -0.60], $t = -3.01$, $p < .001$). Subsequently, a negative unstandardized coefficient indicated a negative association between the "harsh" parenting profile and prosocial behavior for Italian ethnic majority youth. In addition, as shown in Fig. 3, Italian ethnic majority youth with higher levels of cognitive flexibility ($M + 1SD$) showed higher prosocial behavior than those with lower levels of cognitive flexibility (M-$1SD$). Therefore, high levels of cognitive flexibility served as a buffer against the negative association between harsh parenting and prosocial behavior for Italian ethnic majority youth

Sensitivity Analyses

Sensitivity analyses were conducted in both latent profile analysis and linear regression analysis to examine the robustness of the results. Specifically, in the latent profile analysis, I first put family SES as the predictor of three emerging parenting profiles and regarded the "strict-affectionate" profile as the reference group, compared with the "harsh" and "supportive" profiles. The results showed that youth from high-SES family backgrounds were less likely to be classified into the "harsh" profile than the "strict-affectionate" profile (odds ratio = 1.17, $p = 0.02$), whereas no significant differences were found between the "supportive" profile and the "strict-affectionate" profile (odds ratio = 0.95, $p = 0.53$). By conducting this sensitivity analysis, I found that the main patterns and number of participants in each parenting profile were analogous to the original analysis, although I detected a subtle difference in family SES between the "harsh" and "strict-affectionate" profiles.

Furthermore, linear regression analysis was reanalyzed by replacing the original family SES with the standardized family SES, and the results suggested no meaningful change regarding the direction or significance of the findings derived from the original analyses using the original family SES scores. I provided information on the statistical parameters of this analysis in Table S1 in the supplemental materials. In conclusion, the consistency of these results provided additional insights into the robustness and trustworthiness of latent profile analysis and linear regression analysis.

Discussion

The current study aimed to explore perceived parenting profiles and their association with cognitive flexibility and prosocial behavior in early adolescence. Specifically, I assessed whether cognitive flexibility moderated the expected link between parenting styles and prosocial behavior by comparing early adolescents with a Chinese immigrant background with their nonimmigrant majority peers in China and Italy to highlight cultural and immigration-related influences on these associations. The current findings yielded three parenting profiles: "harsh", "supportive", and "strict-affectionate". Chinese immigrant youth showed more cognitive flexibility than their majority peers in both China and Italy. Furthermore, cognitive flexibility strengthened the association between "supportive" parenting and prosocial behavior among Chinese immigrants, and buffered against the detrimental effect of "harsh" parenting on prosocial behavior among Italian nonimmigrant youth.

The first goal of the current study was to identify parenting profiles based on the dimensions of perceived parental warmth and control. The results revealed three distinct profiles: "harsh", "supportive", and "strict-affectionate". In

particular, Chinese immigrant-origin, Italian ethnic majority youth in Italy, and Chinese ethnic majority youth in China were overrepresented in each of these profiles, respectively. Chinese adolescents from immigrant families seem to regard their parents as using high levels of control, consistent with prior research on Chinese immigrants in the US and Canada. For example, Chinese Canadian immigrant mothers showed more control (high demandingness but low responsiveness) than Mainland Chinese mothers (Su & Hynie, 2011). A possible explanation relates to the immigration-related stress and low social support these parents often encounter. Indeed, immigrant parents confront unique challenges to their involvement in their children's activities because of language barriers and lack of familiarity with the educational system of a host country. The experience of stress may spill over into how parents manage and express control (Leinonen et al., 2003; Miao et al., 2018).

Regarding Chinese ethnic majority youth in China, their high presence in the strict-affectionate profile corroborates prior research on traditional Chinese parenting which highlights the salience of this culturally specific and dominant parenting construct (Chao, 1994; Wang et al., 2022). Mainland Chinese parents are characterized by an emphasis on self-discipline and hard work, high expectations, and parental sacrifice to contribute to harmonious family functioning, along with an emphasis on high involvement (Lan et al., 2019; Stewart et al., 1998). In contrast, Chinese immigrant parents may exhibit less warmth and responsiveness toward their children due to economic strain and acculturative stress (Kim et al., 2013a; Miao et al., 2018).

The overrepresentation of Italian ethnic majority adolescents in the supportive profile can be explained in terms of how emotional expressivity is viewed in Italian families. Italian culture stresses the importance of familistic values, and these values call upon expressions of support and mutual affection, with the open disclosure of emotional states and responsiveness toward children being viewed as an appropriate assertion of the independent self (Claes et al., 2003). Indeed, in the context of parent–child interactions, Western cultures typically value more demonstrative ways of expressing parental warmth, physical closeness, and open communication than Chinese cultures (Harkness et al., 2006).

Furthermore, the results showed that Chinese immigrant-origin youth showed higher levels of cognitive flexibility than their Chinese and Italian ethnic majority peers did. This finding is in accordance with prior research highlighting that cognitive flexibility is pronounced in individuals with culturally diverse experiences, especially concerning biculturalism (Ahn et al., 2008; Fuligni & Tsai, 2015; Legare et al., 2018). Adolescents with immigrant backgrounds are immersed in different cultural milieus and consistently manage and reconcile potential conflicts to function well in both original and host cultures regarding socialization goals and normative practices. Thus, immigrant youths often negotiate the demands of two cultures and develop a thinking style characterized by the flexibility to actively participate in a context distinct from their heritage culture (Bernardo & Presbitero, 2018; Ritter et al., 2012). The lack of differences in cognitive flexibility between Chinese and Italian nonimmigrant early adolescents is consistent with prior research suggesting that Asian children's performance in cognitive flexibility tasks is comparable to their U.S. peers' performance (Lan et al., 2011). Although this issue deserves further investigation, cognitive flexibility may be less pronounced among individuals exposed to a monolingual, monocultural environment.

The second aim of this study was to investigate the associations among parenting profiles, cognitive flexibility, and teacher-rated prosocial behavior. Specifically, I examined whether child cognitive flexibility moderated the parenting profile-prosocial behavior link in the three cultural groups. In the analyses, I did not find a significant main effect of parenting profiles on prosocial behavior. Albeit counterintuitive, this result resembles prior research suggesting that perceived positive parenting is related to prosociality toward family members, and not toward other targets, such as friends or strangers, especially during adolescence (Guroglu et al., 2014). I also found a direct and positive association between cognitive flexibility and prosocial behavior. Adolescents who have a greater tendency to imagine other people's psychological point of view may be more likely to be other-oriented and aware of others' needs. Thus, more cognitively flexible individuals might be better at finding ways to help others than those with low flexibility (Eisenberg et al., 2006).

In relation to the hypothesized interaction effects, cognitive flexibility interacted with cultural group in moderating the relation between early adolescents' perceived parenting style and teacher-rated prosocial behavior. Specifically, in the context of a supportive parenting style, higher levels of youth cognitive flexibility were linked to more prosocial behavior for Chinese immigrant-origin adolescents in Italy. This finding extends previous research indicating that cognitive flexibility is one of the benefits experienced by immigrant youth as they learn how to negotiate the demands of multiple cultures (Ahn et al., 2008). Supportive parents offer children feelings of security, trust, and protection, which can enhance children's feelings of belonging and connectedness to others, thereby facilitating prosocial behavior instead of self-oriented activities (Pastorelli et al., 2016). This seems to be particularly true for Chinese early adolescents with an immigrant background, since the formation of a bicultural identity involves the ability to shift between the home culture, with Chinese beliefs and values reflecting interdependence and group harmony, and Italian mainstream values encompassing autonomy and self-maximization. Of interest, no significant interactions

emerged for the other two cultural groups. It is possible that the availability of supportive parents may sufficiently offset the potential risks and challenges encountered by monocultural ethnic majority youths, who are generally less exposed to family adversity (Pettit et al., 1997).

The data also showed that in the presence of a harsh parenting style, higher levels of cognitive flexibility were linked to greater prosociality among Italian nonimmigrant ethnic majority adolescents. This finding is in accordance with prior research indicating that cognitive flexibility may serve as a protective factor in at risk contexts within Western societies (Blair & Raver, 2012; Motti-Stefanidi & Masten, 2017; Spann et al., 2012). Indeed, it is well-documented that in such cultures, individuals may regard excessive parental control as an intrusion into their autonomy, and high levels of parental control might be perceived as hostile and rejecting by adolescents from individualist cultures (Fung & Lau, 2012), a pattern which may lead to reduced prosocial tendencies. Under this unfavorable condition, cognitive flexibility could dampen the detrimental effect of this parenting style by facilitating the ability to identify and consider other available alternatives to minimize parent–child conflicts. For instance, increased shifting skills may enable independence-oriented youths to generate more appropriate and flexible behavioral responses during negotiations with parents who adopt a harsh parenting style, therefore resulting in an overall greater engagement in cooperative behaviors which characterize prosociality. No moderating effect of cognitive flexibility in the association between parenting profiles and prosocial behavior emerged for the Chinese ethnic majority group, suggesting that other potential moderators not considered in this study, such as effortful control or self-regulation, might be more relevant in shaping the parenting styles-prosocial behavior link, since these individual traits have been shown to be particularly emphasized by Mainland Chinese parents in their socialization goals and behaviors (Zhou et al., 2004).

Overall, the identified parenting profiles and their different distribution across cultural groups reflect the distinct cultural values of China and Italy as well as the immigration experience of Chinese families. In particular, the harsh pattern might be the result of difficult socioeconomic circumstances as well as an increased emphasis on traditional parenting styles which are frequently observed among immigrant families settled in Western societies (Su & Hynie, 2011).With regard to patterns of associations, the current study revealed that parenting styles interacted differently with cognitive flexibility depending on the cultural group, suggesting that the protective role of individuals' shifting ability largely depends on early adolescents' subjective experience of parental caregiving behaviors which, in turn, is likely shaped by the acculturation process.

Limitations and Implications

The current study provides new evidence on the positive role of cognitive flexibility in the association between perceived parenting styles and early adolescents' prosocial behavior by highlighting the specificity of effects as a function of culture and immigration-related factors. However, some limitations should be acknowledged when interpreting the results.

First, the cross-sectional design limits conclusions about causality. Future research may adopt a longitudinal design to address the impact of parenting profiles, cognitive flexibility, and culture/immigration on prosocial behavior over time. Second, parenting styles were measured via early adolescents' self-reports, which are likely influenced by a number of factors, such as social desirability bias, personality characteristics, and memory recall. Further research is warranted to include parental reports as well as behavioral observations of parent–child interactions in structured or unstructured situations to increase the validity of findings. Third, this study regarded prosocial behavior as a global construct, failing to differentiate between the subtypes of this behavior (e.g., altruistic, compliant, emotional, and public; Eisenberg et al., 2006) as well as between the motivations underlying it. Hence, future studies may consider 'unpacking' this important developmental outcome to provide a more fine-grained analysis of its association with relevant constructs pertaining to parenting and executive functions. Fourth, the Chinese immigrant sample comprised both first- and second-generation youths. Since prior research suggests that generational status may influence acculturation processes and ethnic identity formation (Miconi et al., 2019), future research might address potential group differences in patterns of associations among the variables under study. Fifth, the generalizability of acculturation processes in the current study is limited because I specifically focused on the parenting domain, on two societies, and on three early adolescent samples. Furthermore, no direct assessment of cultural values (e.g., individualism/collectivism) or acculturation orientations was used. Future studies should incorporate other cognitions and dimensions related to intergroup processes, ethnic minority-majority relations, and cultural beliefs as well as other settings/contexts to address the role of acculturation associated with adolescents' prosocial behavior (Bornstein, 2017a). Sixth, I assessed cognitive flexibility through a single task, namely the Wisconsin Modified Card Sorting Test. Although this is a widely-used and methodologically sound assessment tool (Miconi et al., 2019), scholars might include additional tasks to evaluate early adolescents' shifting ability to better understand the specific aspects of cognitive flexibility that are linked to both parenting styles and youth prosocial behavior across diverse cultural contexts. Last, although the Family Affluence Scale received a higher response rate than conventional measurements, such as parental educational

background and occupational status, a subset of items in the scale may exhibit cross-national differences (Torsheim et al., 2016). For instance, owning a car may be a necessity in Italy, as this is a major means of transport, but owning a car in China may not be a necessity, as many people travel on public transport in urban areas. Hence, in this case, owning one car in the family may already reflect affluence in the Chinese cultural context, resulting in a potential bias in comparisons across different countries. Future studies are recommended to select culturally sensitive family socioeconomic indicators for more accurate cross-cultural comparisons.

Notwithstanding these limitations, several theoretical and practical implications are possible. With regard to theory, the current study contributes to the existing literature on the role of culture and migration in shaping Chinese early adolescents' perceptions of parenting styles, cognitive flexibility, and prosocial behavior. In this regard, the comparison of an immigrant minority group with the respective nonimmigrant majority groups in the countries of origin and destination is particularly useful to highlight acculturation processes at the group level which might explain different patterns of associations among the variables of interest (Bornstein, 2017a, b). Moreover, the results are in line with recent conceptualizations of executive functions which highlight the moderating role of cognitive flexibility in the link between environmental factors and psychosocial outcomes by documenting that increased cognitive flexibility can facilitate prosocial behavior in the context of a warm family environment, and attenuate the detrimental effects of a controlling parenting style. Likewise, the increased cognitive flexibility found among immigrant youth lends further support to the "immigrant paradox" phenomenon highlighted in prior migration research (Motti-Stefanidi & Masten, 2017).

From an applied perspective, although Chinese immigrant parents need to cope with many stressors in the host country and often have limited time to interact with their children (Su & Hynie, 2011), positive parent–child interactions and parental involvement should be supported to facilitate positive adaptation in their offspring. For example, educators and professional care workers should supervise parents to spend more quality time together with their children, such as show their love and create parent–child rituals. Moreover, given the possibility to train executive functions, school-based psychoeducational activities may focus on increasing cognitive flexibility in light of its positive effect in both mainstream and immigrant youth. For example, computerized tasks and practical activities targeting the ability to shift perspectives and take other people's point of view may be helpful to enhance the quality of intercultural relationships both at home and at school.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12144-022-03140-9.

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Data Availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Informed Consent All procedures performed in studies involving human participants were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all participants included in the present study.

Conflict of Interest The author has no conflicts of interest to declare.

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