



Unlocking the Hidden Impact of Parents' Sociocultural Level on Childhood Adaptive Behavior

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Abstract

Adaptive behavior comprises conceptual, social, and practical skills that individuals learn and express in their daily lives. Understanding the contextual factors that influence the development of adaptive behavior is crucial for the well-being of children. Using path analysis, we cross-sectionally examined the relations between Vineland-II adaptive behavior of Italian girls ($n=156$) and boys ($n=149$) aged 3–14 and parental sociocultural dimensions (socioeconomic status, cultural capital, social capital) with attended school year as a moderator. Mothers' sociocultural level showed numerous and generally positive relations with their children's adaptive behavior, whereas fathers' sociocultural level exhibited fewer and more mixed relations. Furthermore, school year attended had direct negative effects on adaptive behavior and generally moderated in a positive or mixed way the relationships between parents' sociocultural level and daughters' and sons' adaptive behavior, respectively. Policymakers should be aware of the relations between parental sociocultural level and their offspring's adaptive behavior.

Keywords Structural equation modeling · Moderation · Adaptive functioning · Sociocultural level · Parents

Introduction

Investigating the influence of parents' sociocultural background on their offspring's adaptive behavior is crucial for understanding the factors contributing to the well-being of children, youth, and families. Adaptive behavior represents the conceptual, social, and practical skills acquired and carried out by individuals daily [1]. Adaptive behavior

concerns activities that help people achieve their goals and integrate into the community and is related to the people's quality of life (e.g., [2]). Adaptive behavior thus represents a fundamental component for understanding human behavior [1].

Learning and showing adaptive behavior depend on the demands and expectations of the cultural and geographic groups a person belongs to [1, 3] and are linked to the people and places with which the individual interacts. Family environment is one of the primary sources of influence during infancy and adolescence. Beyond this, school and peer interactions are essential for individual skill development both in conceptual and social domains (e.g., [4]). However, studies about the relations between environmental factors such as parents' sociocultural background and school environment and adaptive behavior are still lacking.

Girls and boys exhibited different timing of acquisition of cognitive skills [5], but also distinct age trajectories of adaptive behavior development during childhood [6, 7]. The interaction between gender and contextual variables on child outcomes has been reported [8, 9]. For instance, research has shown that distinct experiences, such as different childcare environments, give rise to different adaptive behaviors in girls and boys [8]. Therefore, assessing

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the adaptive behavior of girls and boys separately from an ecological perspective is crucial.

Sociocultural Level

According to Lamont and Lareau [10], sociocultural level (SCL) consists of interests, knowledge, and activities depending on a person's cultural, social, and economic resources. SCL includes Socioeconomic Status (SES), cultural capital, and social capital [11, 12]. SES refers to a person's or family's position in a social system with values (e.g., economic resources, professional prestige, educational level) not fairly allocated [13]. SES is frequently measured using occupation (e.g., type and prestige), educational level (e.g., years of education), and income [13].

Cultural capital concerns knowing and using cultural codes essential to the individual's community [10]. It encompasses three domains [14]: (a) *Participating*: involvement in events/affairs of cultural, community service, political or religious groups and associations [15]; (b) *Consuming*: cultural activities (e.g., reading books, visiting art galleries) and goods (books, paintings, sculptures) (e.g., [16]); (c) *Expert using*: cultural technical skills and knowledge (e.g., using foreign languages, exhibiting in plays, writing music or text) [17].

Social capital includes resources related to enduring and trustable social ties [11], and distinguishes between *bonding* and *bridging* social capital. Bonding social capital refers to resources connected to networks in close social proximity (e.g., immediate and extended family members, colleagues, and friends). Bridging social capital refers to resources related to the connections with groups or associations (i.e., community service, cultural, political, or religious groups) [18].

Cultural capital and social capital are directly interrelated and positively dependent on SES [19, 20]. Parents with a high SES tend to facilitate their offspring's participation in organized activities, have more relations with educators and parents of their offspring's mates [21, 22], and include more professionals (e.g., psychologists, lawyers, and physicians) in their network [21].

Parental Sociocultural Level and Offspring' Adaptive Behavior

The relations between parents' SCL domains and offspring's adaptive behavior domains have been investigated in toddlers with autism spectrum disorder [23]. It was found that mothers' education level may facilitate conceptual skills, and that mothers' bridging social capital and fathers' cultural activities are related to daily living skills. Another recent study [24] found that levels of education and SES of

both parents are related to the conceptual and social skills of their offspring with autism spectrum disorder. Similarly, maternal education level was found to be associated with the practical adaptive abilities of children with a brain tumor [25].

Generally, studies involving children with typical development considered only SES as an indicator of family SCL and did not take into account all the domains of adaptive behaviors simultaneously. Concerning conceptual skills, SES-related disparities were found in children's receptive and expressive language [26] and in university students' abstract thinking and reasoning ability [27]. Regarding social skills, SES-related differences have been found in children's social competencies and behavioral adjustments [28]. The effects of family SES were also found in participation in organized recreational and sports activities [29]. Concerning practical skills, children of lower SES show a decline over the years, moderated by other aspects of the parenting environment, such as mothers' stimulation [30].

A small number of research have explored the association between families' cultural and social capital and children's adaptive behavior domains. Concerning cultural capital, researchers agree that parent-child literacy experiences (i.e., reading to children or shared reading and visiting libraries) may be positively related to children's interest and ability in reading [22, 31] and communication skills [32]. Other studies have shown that the home learning environment can positively affect both cognitive and social skills [33]. Concerning the relations between social capital and adaptive behavior, it was found that mothers' family support is associated with children's adaptive behavior with positive parenting practices as a mediator [34]. Furthermore, caregivers' social capital is associated with children's social-emotional development [35], daily activities, personal development, and better health outcomes [36], but see Villalonga-Olives & Kawachi [37].

The present study aimed to elucidate the interrelationships between parents' SCL domains and their offspring's adaptive behavior domains through the use of path analysis. To what extent do mothers' and fathers' SES (occupational prestige and educational level), cultural capital, and social capital related to their female and male children's adaptive behavior (conceptual, social, and practical skills), and to what extent is this relationship moderated by the attended school year?

We analyzed the impact of mothers and fathers separately, as we hypothesized a specific relation, in accordance with existing literature indicating that mothers' and fathers' SCL present different patterns of associations with the adaptive behavior of their offspring with autism spectrum disorder [23, 24] and with other characteristics [38]. Distinguishing between the characteristics of mothers and fathers allows

for a more detailed examination of the specific contributions of each parent to the development of their offspring. Similarly, we postulated that the relations between parental SCL and their offspring's adaptive behavior would manifest differently for girls and boys. This is in line with previous studies concerning the relations between parental SCL and personality traits of offspring with typical development [9], as well as gender differences in adaptive behavior [7, 8].

In light of the pivotal role context plays in the learning and expression of adaptive behavior [1, 3, 7], we introduced cross-sectionally the attended school year as a moderator. As contextual factors which influence the opportunities for development and learning vary depending on the school year, we postulated a direct effect of the school year attended on adaptive behavior. Furthermore, as students at different educational stages appear to benefit from different forms of cultural capital [39], we hypothesized that the interaction between SCL dimensions and adaptive behavior might depend on the school year.

This study has an exploratory nature given that very limited findings exist regarding the relations between mothers' and fathers' SCL domains and the adaptive behavior domains of female and male offspring. Indeed, the unique contribution of the present study is that it simultaneously examined the impact of all dimensions of mothers' and fathers' SCL (i.e., SES, cultural capital, social capital) on all domains of adaptive behavior of their female and male children, separately, simultaneously taking into account the school environment.

Method

Participants

The participants included 305 Italian children with typical development (156 females [51%] and 149 males [49%]), aged 3–14 years ($M=8.18$, $SD=3.25$), attending kindergarten (32%), elementary school (42%), or middle school (26%), and their parents. The mothers ($n=305$) were 22–55 years old ($M=40.29$, $SD=5.03$), and the fathers ($n=305$) were 30–62 years old ($M=43.30$, $SD=5.32$). Table S1 of the Supplementary Material reports the schools attended by the children/adolescents and the educational levels of their mothers and fathers separately for girls and boys. Table S2 of the Supplementary Material reports the age and adaptive behavior of girls and boys and the cultural capital, social capital, and occupational prestige of their mothers and fathers (see Sect. 2.2 for the instruments used), separately for girls and boys. Both girls and boys had levels of adaptive behavior domains within one standard deviation from the mean of the corresponding normative groups. Most parents have a

high school diploma and an intermediate occupational prestige level. Compared to the scores of 150 Italian mothers and 125 Italian fathers [9], mothers and fathers in this study obtained a mean score higher than four points (mothers) or two points (fathers) for the Scale of Cultural Capital [14]; and a mean score higher than eight points (mothers) or four points (fathers) for the Italian version of the Personal Social Capital Scale [18]). All families lived in villages or cities with fewer than 20,000 inhabitants (56%), 20,000–250,000 inhabitants (35%), and more than 500,000 inhabitants (8%), placed in Northern and Central Italy.

Participants were selected from a subsample of the normative groups of the Vineland-II scales of adaptive behavior (Italian adaptation) [40]; It. ad. [41]) for which the SCL domains of both parents were assessed during standardization. The data collection for the participants of the present study was conducted between 2011 and 2015. It was obtained simultaneously for individuals of different ages from the same wave. The inclusion criteria were as follows: (a) no diagnosis of major psychological or health disorders; (b) at least one parent born in Italy; and (d) no siblings involved in the standardization study. A total of 328 participants (52% female) agreed to participate, but 14 were eliminated: five had missing values and nine were detected as simulators based on the Balanced Inventory of Desirable Responding - Short Form score (BIDR-6; [42, 43]). Of the remaining 314 (52% female), nine outliers were excluded based on Tabachnick and Fidell's [44] recommendations about the use of structural equation models: six girls (five univariate outliers and one multivariate outlier) and three boys (three univariate outliers and one multivariate outlier). There were no missing data.

Instruments

Adaptive Behavior

Adaptive behavior was assessed with the Italian adaptation of the Vineland-II Survey Interview Form [40]; It. ad. [41]. It is a semi-structured interview with a person who knows the individual being evaluated well and has had the opportunity to see them in a variety of contexts over an extended period of time (the interviewee is generally a parent, in the case of children). Vineland-II is composed of the Communication, Daily living skills, and Socialization scales, allowing for the assessment of the three conceptual, social, and practical skills domains, respectively, in individuals aged 0–90. Vineland-II also computes an individual's adaptive behavior total Standard Score ($M=100$, $SD=15$). The Vineland-II Italian version showed excellent psychometric properties. For this investigation, the split-half coefficients for Vineland-II Communication, Daily living skills, and

Socialization were 0.99, 0.99, and 0.98 for girls, and 0.98, 0.99, and 0.99 for boys, respectively. These coefficients are like those of the Vineland-II Italian adaptation for individuals aged 3–14 [41]. In the present study, the Vineland-II was administered to one of the parents of the child (see Sect. 2.3 Procedure for details).

Socioeconomic Status

SES was measured considering the mothers' and fathers' educational levels and occupational prestige. Education level was assessed by asking for the highest level of schooling completed among 11 potential levels ranging from the lowest (elementary school) to the highest (doctoral degree). Occupational prestige was evaluated using the Italian Occupational Prestige Scale, which includes 110 occupational categories, each associated with a professional prestige score ranging from 10.84 to 89.93 (for more details, see [45]).

Cultural Capital

The Scale of Cultural Capital was employed to measure parental cultural capital [14]. Participants were asked to answer 14 items using a 5-point Likert scale (0 to 4) that assesses the three domains of cultural capital: *Participating* (four items), *Consuming* (five items), and *Expert using* (five items). The sum of all item scores generates a cultural capital total score. The Scale of Cultural Capital has excellent psychometric properties, confirming the three-factor structure of the cultural capital construct [14]. In this investigation, the internal consistency of the total scale (McDonald's $\omega=0.82$ for both mothers and fathers) was similar to that reported by Balboni et al. [14].

Social Capital

Social capital was measured using the Italian version of the Personal Social Capital Scale [18]). Participants were asked to answer ten questions (divided into 54 sub-items) using a 5-point Likert scale (1 to 5) to measure the two domains of bonding and bridging social capital (five items each). Altogether, item scores generate a social capital total score. The shorter Italian version [46], as did the Chinese [18] and South American versions, showed good psychometric properties. In this study, the internal consistency of the total scale was good (McDonald's $\omega=0.77$ for both mothers and fathers).

Social Desirability

Social desirability represents the tendency to provide answers to look good. It was measured with the BIDR-6 [42, 43] made of 16 items to be rated with a 6-point Likert scale. It shows appropriate reliability and validity [42]. In the present investigation, Cronbach's alpha was equal to 0.62 and 0.69 for mothers and fathers, respectively, similar to that found by Bobbio and Manganelli [42]. Participants with scores exceeding the 95th centile obtained from the Italian reference group were detected as simulators.

In the present study, all instruments were completed by the parents of the children.

Procedure

Participants were recruited using a snowball sampling procedure. Trained researchers administered Vineland-II to the mothers ($n=266$, 87%) or fathers ($n=39$, 13%) of each participant. Mothers and fathers separately filled out a booklet containing the Personal Social Capital Scale– Italian Version, Scale of Cultural Capital, BIRD-6, and demographics (including SES). To avoid any order effect, the Scale of Cultural Capital and Personal Social Capital Scale were presented in an alternate order. The BIDR-6 and demographics were always at the end.

Data Analysis

The R package lavaan [47] was utilized to run two path-analysis models: one for girls and one for boys. Based on previous studies on the relations between education level and occupational prestige (SES indicators), cultural capital, and social capital of women and men [19, 20], mothers' and fathers' educational levels and occupational prestige were introduced as predictors of their own cultural capital; mothers' educational level and fathers' occupational prestige were predictors of their own social capital; and educational level and occupational prestige, as well as cultural capital and social capital, were interrelated within and across parents. Based on the literature on adaptive behavior (e.g., [1, 23]), the interrelated domains of adaptive behavior as measured with the Vineland-II Communication, Daily living skills, and Socialization domains were predicted directly by mothers and fathers cultural and social capital, and, directly as well as indirectly mediated by cultural and social capital, by mothers' and fathers' educational level and occupational prestige. Finally, based on previous studies that have highlighted the relevance of context for the learning and expression of adaptive behavior [1, 3, 7], the children's attended school year was included as a moderator of the relations between each SCL and the adaptive behavior domains.

The attended school year was defined with a total of 11 points, ranging from the first year of kindergarten (1) to the last year of secondary school (11). We transformed the values of the attended school year into centered scores by subtracting the mean of the attended school year before estimating the interaction terms [44]. The model goodness of fit was investigated using the maximum likelihood estimator (ML). The comparative fit index (CFI), root-mean-square error of approximation (RMSEA) with 95% confidence intervals (CI), standardized root-mean-square residual (SRMR), and chi-square statistic (χ^2) were considered as indexes for evaluating model fit [48]. Values higher than 0.95 for CFI, smaller than 0.05 for RMSEA, and smaller than 0.08 for SRMR indicate an acceptable fit [48]. In the case of a poor model fit, the modification indexes were inspected.

We also investigated if the present model fitted better than the alternative model with the Vineland-II adaptive behavior total Standard Score instead of the three adaptive behavior domains for both girls and boys. The two models were compared using Akaike’s Information Criterion (AIC; a lower value indicates a better fitting model) [48]. R^2 of each path model was reported as both an index of the total explained variance of the outcomes by the model and as an index of the effect size of the overall model [49]. The standardized path coefficients can be interpreted as an effect size index, and evaluated as follows [50]: 0.10–0.29 small, 0.30–0.49 medium, and ≥ 0.50 large.

Univariate outliers (i.e., respondents with $|z|$ score higher than 3.29) and multivariate outliers (i.e., respondents with the Mahalanobis distance’s probability lower than 0.001) were detected for all continuous variables separately for girls and boys. The normality of the univariate distribution

was assured by inspecting skewness and kurtosis (values from -1.00 to 1.00 are adequate). The normality of the multivariate distribution was investigated with the Mardia test [44]. Sample size adequacy was verified by calculating model statistical power using the R package semPower [51]. We set the level of effect size (RMSEA) at 0.50 and the alpha level at 0.05, following the post hoc approach of MacCallum et al. [52]. The statistical power was 0.74 for girls and 0.63 for boys.

Results

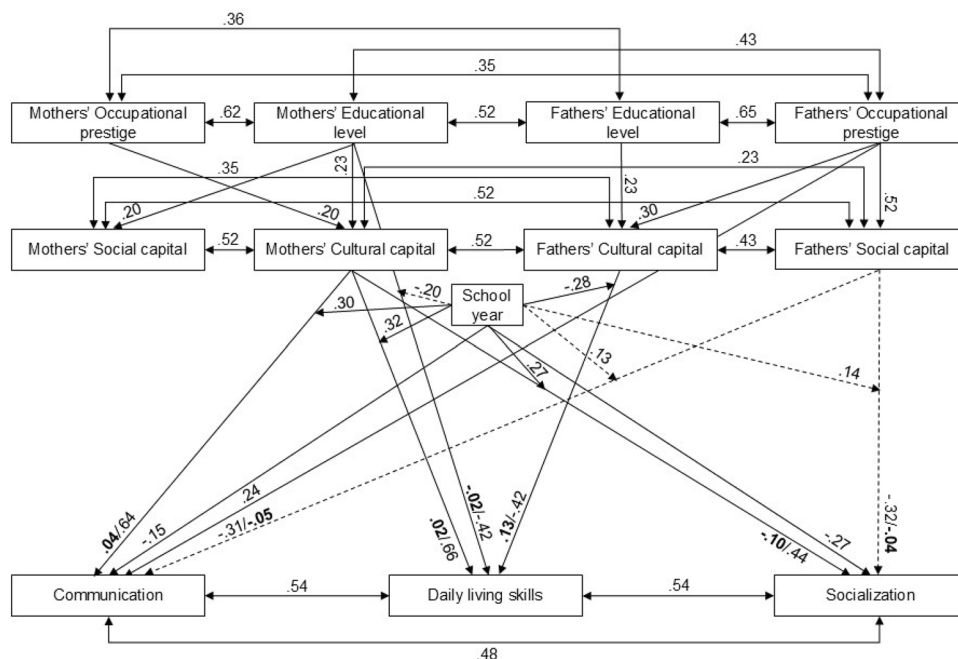
Path Analysis Models for Girls

All variables were normally distributed. Mardia’s value, corresponding to 83.3, was barely higher than the reference value of 80 (corresponding to $k(k+2)$, $k=8$); thus, the data were close to being multivariate and normally distributed. However, ML estimator can be used even with non-normality [49]. The number of participants for each path model was adequate based on Anderson & Gerbing [53].

The resulting model presented good fit indexes: CFI=0.96; RMSEA=0.042 [CI=0.011–0.064]; SRMR=0.052; $\chi^2_{(90)}=115.19$, $p < .05$; AIC=7,833; $R^2=16\%$.

As can be seen in Fig. 1 and Table S3 of the Supplementary Material, the attended school year had a direct negative effect on girls’ Communication and Socialization and moderated (see Table S4 of the Supplementary Material) the direct positive effect of mothers’ cultural capital on the three adaptive behavior domains. Indeed, only for daughters attending middle school, mothers’ cultural capital positively

Fig. 1 Path Analyses Model of the Relations Between Mothers’ and Fathers’ SCL Domains and Daughters’ Adaptive Behaviors’ Domains. Only significant paths and those not significant but for which the post-hoc group comparisons revealed significant differences (dotted line) are depicted, along with the correspondent standardized path coefficients (only for the relations moderated by the attended school year, the non-significant path coefficients are also reported and shown in bold, and the first coefficient represents that found in kindergarten, while the second coefficient represents that found in middle school)



affected Communication, Daily living skills, and Socialization whereas it did not affect those in kindergarten. These results are also shown in Panels a, b, and c of Fig. 2, which shows the association between mothers' cultural capital and the three adaptive behavior domains for daughters attending kindergarten and middle school (i.e., attended school year that was 1 *SD* below or above the mean of the attended school year, respectively). The attended school year did not moderate the direct effect of the mothers' educational level on their Daily living skills. However, the post-hoc comparison showed a negative direct effect for daughters attending middle school but not for those attending kindergarten.

The attended school year also moderated (see Table S4 of the Supplementary Material) the direct negative effect of fathers' cultural capital on Daily living skills. Indeed, fathers' cultural capital negatively affected the Daily living skills of daughters attending middle school, but not those attending kindergarten (Panel d of Fig. 2). Moreover, the post-hoc group comparisons showed only for daughters attending kindergarten a direct negative effect of fathers' social capital on Communication and Socialization whereas no effects resulted for those in the middle school (direct and moderated effects were both not statistically significant).

As can be seen in Table S5 of the Supplementary Material, the attended school year also influenced the indirect effects of mothers' and fathers' educational levels and occupational prestige on all adaptive behavior domains. Mothers' educational level and occupational prestige had an indirect positive effect (through mothers' cultural capital) on Communication (educational level: $\beta=0.144$, $p=.019$; occupational prestige: $\beta=0.128$, $p=.019$), Daily living skills (educational level: $\beta=0.150$, $p=.018$; occupational prestige: $\beta=0.133$, $p=.019$), and Socialization (educational level: $\beta=0.099$, $p=.047$; occupational prestige: $\beta=0.088$, $p=.048$) domains only for daughters attending middle school and not for those in kindergarten. Fathers' educational level had an indirect negative effect (through fathers' cultural capital) on the Daily living skills ($\beta = -0.095$, $p=.041$) of daughters attending middle school but not those attending kindergarten. Fathers' occupational prestige had a negative indirect effect (through fathers' social capital) on the Communication ($\beta = -0.105$, $p=.041$) and Socialization ($\beta = -0.107$, $p=.038$) of daughters attending kindergarten but not those attending middle school. Finally, fathers' occupational prestige positively influenced daughters' Communication independently of the attended school year. Mothers' social capital did not affect their daughters' adaptive behavior.

The alternative model with the Vineland-II adaptive behavior total Standard Score instead of the three Vineland-II domains showed worse fit indexes (CFI=0.92; RMSEA=0.056 [CI=0.011–0.064]; SRMR=0.061; $\chi^2_{(90)}=133.67$, $p < .01$) but a lower AIC (7,123).

Path Analysis Models for Boys

All variables were normally distributed. However, for boys, the data were slightly not multivariate normally distributed because Mardia's value, corresponding to 85.9, was barely higher than the reference value of 80 (corresponding to $k(k+2)$, $k=8$). The number of participants for each path model was adequate based on Anderson & Gerbing [53].

The resulting model presented poor fit indexes: CFI=0.88; RMSEA=0.082 [CI=0.065 –0.099]; SRMR=0.070; $\chi^2_{(90)}=180.24$, $p < .001$; AIC=7,371. Based on the modification indexes, we tested a second model, deleting the direct effect of mothers' and fathers' educational levels on all adaptive behavior domains, given that they were not statistically significant. The resulting model showed acceptable fit indexes: CFI=0.91; RMSEA=0.072 [CI=0.052–0.091]; SRMR=0.072; $\chi^2_{(78)}=138.23$, $p < .001$; AIC=6,735; $R^2=16\%$.

As shown in Fig. 3 and Table S3 of the Supplementary Material, the attended school year had a direct negative effect on boys' Socialization and moderated (see Table S4 of the Supplementary Material) the direct positive effect of mothers' cultural capital on Daily living skills and mothers' social capital on Socialization. In particular, only for sons attending middle school, mothers' cultural capital positively affected Daily living skills, and mothers' social capital positively affected Socialization, whereas no effect was detected for those in kindergarten (Panels e, f of Fig. 2).

Moreover, the attended school year moderated (see Table S4 of the Supplementary Material) the direct negative effect of fathers' occupational prestige on Daily living skills. Fathers' occupational prestige positively influenced sons in kindergarten but not those in middle school (Panel g of Fig. 2). Post-hoc group comparison showed only for sons attending kindergarten a direct positive effect of fathers' occupational prestige on Communication and Socialization whereas no effects were found for those in middle school (direct and moderated effects were both not statistically significant).

As can be seen in Table S5 of the Supplementary Material, the attended school year also influenced the indirect positive effect of the mothers' educational level (through their cultural capital) on sons' Daily living skills ($\beta=0.225$, $p=.007$). Mothers' educational level had an indirect positive effect only for sons attending middle school, and not for those attending kindergarten. Finally, mothers' social capital positively affected sons' Communication independently of the attended school year. Mothers' occupational prestige and fathers' educational level, cultural capital, and social capital did not affect sons' adaptive behavior domains.

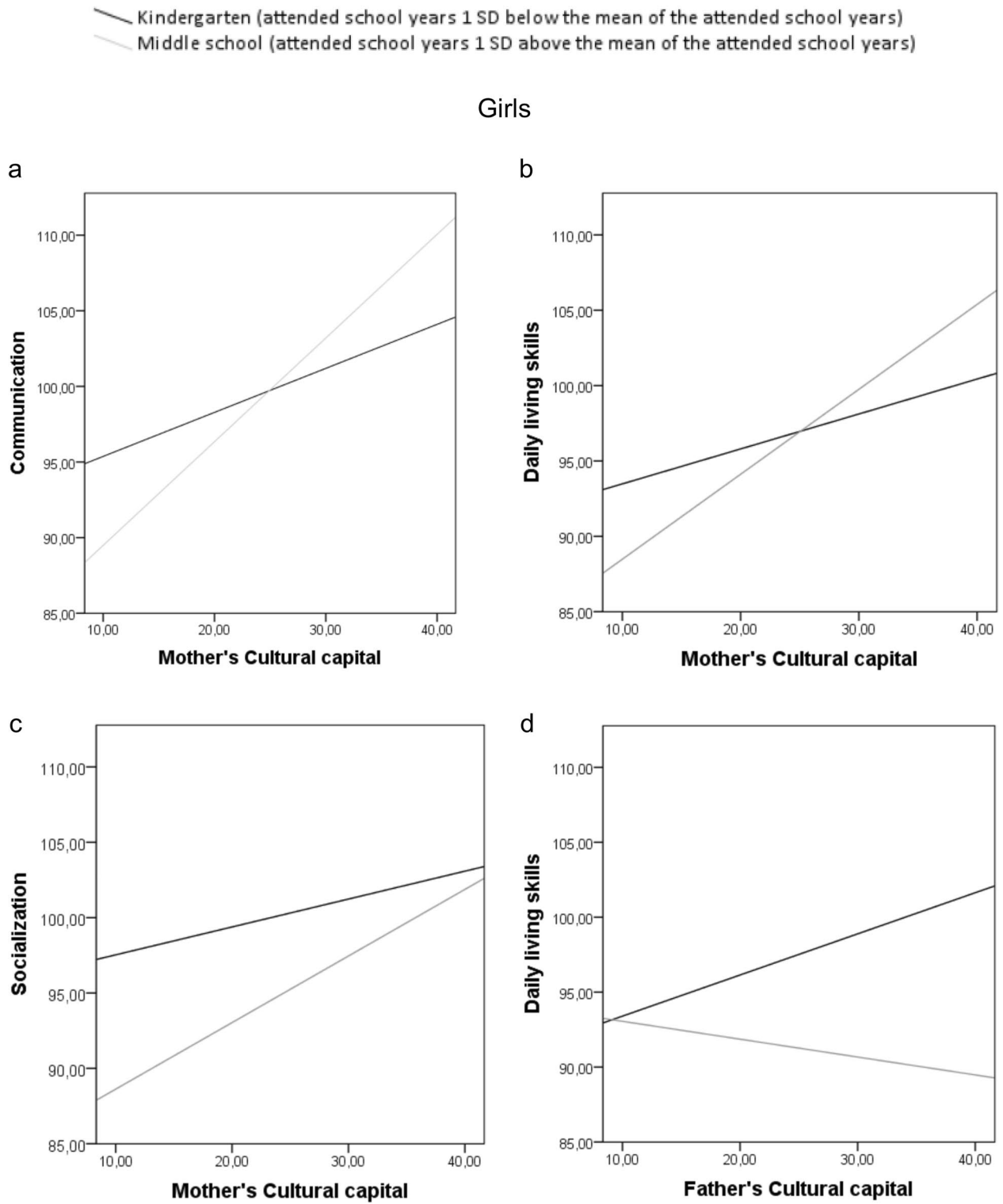


Fig. 2 Statistically Significant Interaction Effects Between Mothers' Cultural Capital or Fathers' Cultural Capital and Daughters' Attended School Years on Girls' Adaptive Behavior Domains (Panels a–d). Statistically Significant Interaction Effects Between Mothers' Cultural

Capital or Social Capital or Fathers' Occupational Prestige and Sons' Attended School Years on Boys' Adaptive Behavior Domains (Panels e–g)

Boys

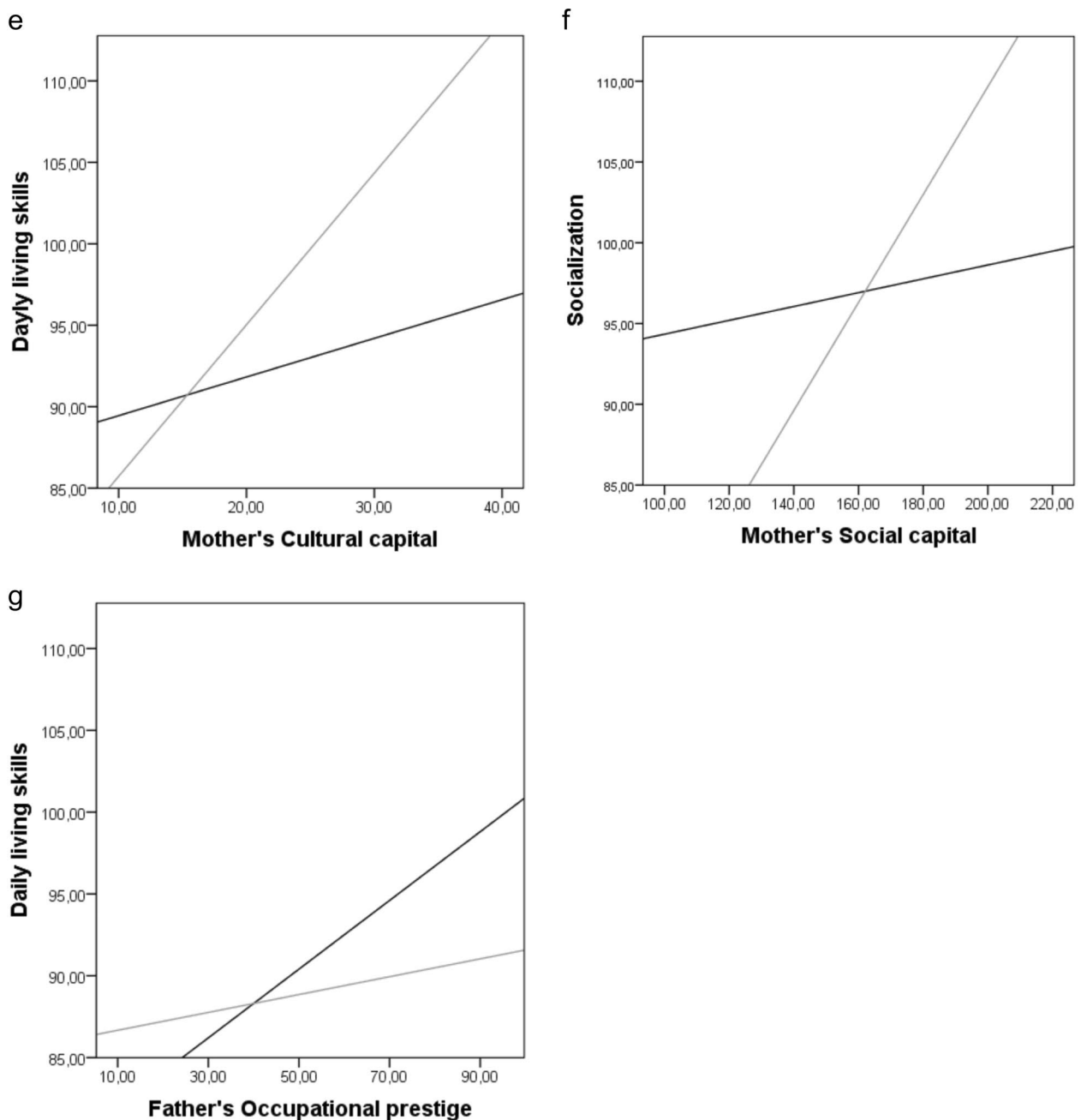


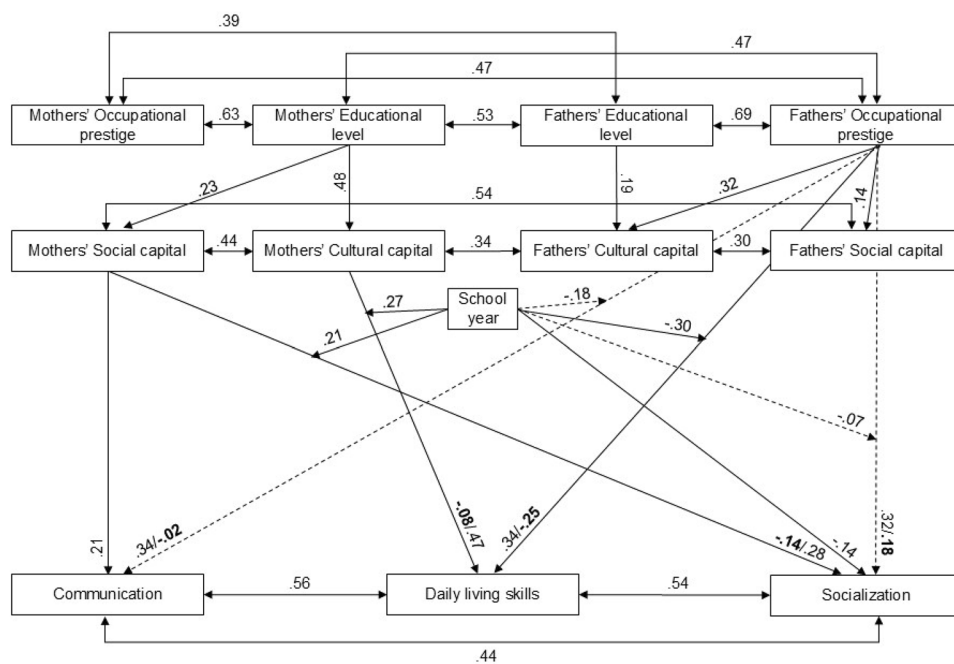
Fig. 2 (continued)

The alternative model presented an insufficient fit index: CFI=0.80; RMSEA=0.105 [CI=0.087–0.123]; SRMR=0.083; $\chi^2_{(74)}=196.56, p<.001$; AIC=6,033.

As can be seen in Figs. 1 and 3, for both girls and boys, the within and across mothers' and fathers' relation coefficients between mothers' and fathers' educational levels and occupational prestige, and cultural and social capital aligned with previous investigations [20]. Finally, for girls

and boys, the correlation coefficients between the adaptive behavior domains were all statistically significant ($p<.001$) and varied from 0.48 to 0.54 and from 0.44 to 0.56, for girls and boys, respectively (Figs. 1 and 3). The results agree with those of prior investigations [23, 54].

Fig. 3 Path Analyses Model of the Relations Between Mothers' and Fathers' SCL Domains and Sons' Adaptive Behaviors' Domains. Only significant paths and those not significant but for which the post-hoc group comparisons revealed significant differences (dotted line) are depicted, along with the correspondent standardized path coefficients (only for the relations moderated by the attended school year, the non-significant path coefficients are also reported and shown in bold, and the first coefficient represents that found in kindergarten, while the second coefficient represents that found in middle school)



Discussion

Adaptive behavior abilities are context-specific [3]; their development follows different trajectories for males and females [7] and is affected by the context [1]. Through path analysis, this study aimed to explore the relations between the adaptive behavior domains of girls and boys with typical development, their attended school years, and each domain of their mothers' and fathers' SCL.

The attended school year directly affected specific children's adaptive behavior domains and moderated most of the relations between parents' SCL and their offspring's adaptive behavior domains. Specifically, the attended school year had a negative direct impact on both girls' and boys' socialization domain and, only for girls, on the communication domain, indicating that as school progresses, adaptive behavior decreases. Although the attended school year is a slightly different variable from the child's chronological age, this result is challenging to interpret, given that adaptive behavior increases in complexity during the developmental years. However, human development results from the reciprocal interaction between individuals and their environment [55]. The transition from childhood to early adolescence involves significant biological, cognitive, and social changes [56]. The ongoing maturation of the brain can temporarily impair emotional regulation, increasing vulnerability to risky behaviors, adjustment difficulties [57], and issues related to social norms [58]. Early adolescents increasingly rely on peers, and this transition can induce stress and anxiety regarding their position within the social hierarchy [59]. Nonetheless, the relationship with parents

remains a salient factor in the prediction of their social and emotional adjustment [60]. Middle school introduces greater cognitive and social demands [59, 61], often leading to lower academic motivation and self-esteem [62]. The reduced adaptive abilities observed in middle-school participants in our study may be expression of their difficulty in coping with these challenges and meeting societal expectations. Indeed, adaptive behavior depends on the demands of the individual's living context and is low when society's requests exceed individual abilities (e.g., [1]).

Distinctive patterns of relations between mothers' and fathers' SCL domains and offspring's adaptive behavior domains were found for girls and boys, in line with previous studies investigating the relations between parental SCL and personality traits of offspring with typical development [9], or adaptive and challenging behaviors of offspring with autism spectrum disorders [23, 38]. A more complex pattern of relations was identified for girls than for boys, in line with previous studies on gender differences detected in the SCL structure [19, 20].

Regarding girls, no relation was found with mothers' social capital. In contrast, mothers' cultural capital positively affected all adaptive behavior domains only for those in middle school. The relation between mothers' cultural capital and communication and socialization domains has been confirmed in previous studies [33]. Mothers' cultural capital also mediates their educational level and occupational prestige in positively affecting all adaptive behavior domains of the girls in middle school. The effect of maternal education on the domain of daily living skills is directly negative; however, when the relationship is mediated by

maternal cultural capital, this effect becomes positive. Therefore, our results suggest that mothers' cultural capital could serve to mitigate the adverse effects associated with a high maternal educational level. Mothers with a higher level of cultural capital may be particularly able to integrate intellectual and practical skills into daily living. Thus, they provide the necessary environmental encouragement to promote the development of more complex self-care and autonomy within the community. The maternal figure is widely recognized as the primary caregiver for children, serving as the principal source of identification and role model for her daughter [63]. This dynamic may offer a potential explanation for the observed positive relation between maternal cultural capital and the adaptive behaviors exhibited by middle school-aged daughters across various domains.

The moderating effect of the attended school year on the relation between mothers' cultural capital and daughters' adaptive behavior domains may be due to relationships that take time to build and become detectable only when girls reach middle school age. Furthermore, as early adolescence is identified as a critical period for the amplification of gender roles [64], it is conceivable that at this developmental stage, daughters are especially prone to internalizing maternal values. However, the reciprocal influence between mothers' cultural capital and daughters' adaptive behavior cannot be excluded (e.g., girls with highly adaptive behavioral skills share more cultural activities and interests with their mothers). Therefore, future studies are necessary to completely comprehend the relations between mothers' cultural capital, their interactions with educational level and occupational prestige, daughters' adaptive behaviors, and why these effects are present only in teenagers.

Except for the positive effect of fathers' occupational prestige on daughters' communication domain, regardless of the attended school year, only negative relations were found between fathers' SCL and daughters' adaptive behavior domains. Indeed, fathers' cultural capital and educational level have negative relations, direct and indirect, respectively, with the daily living skills domain of daughters attending middle school but not of those attending kindergarten. Evidence of a negative relation between paternal cultural capital and the abilities of middle-school daughters, but not kindergarten daughters, can be again explained by the hypothesis that gender roles intensify during adolescence [64]. This phenomenon can lead either to a rapprochement with the same-sex parent or to a distancing from the opposite-sex parent. Additionally, adolescence is a period during which parent-child communication is susceptible to tension or negativity. Daughters, in particular, may experience decreased levels of comfort when it comes to communicating with their fathers [65]. These observations may be indicative of a temporary rift or resistance among

female adolescents to their father's values during the middle-school period. It is reasonable to assume that fathers who possess significant cultural capital prioritize self-care and community engagement, which are essential components of daily living skills. Therefore, the negative relations between paternal cultural capital and daughters' living skills seems to be an accurate reflection of girls' efforts to differentiate themselves from the fathers' model during this period of potential distance or conflict.

Concerning the negative effect of mothers' and fathers' educational levels on the daily living skills of middle school-aged daughters, our results are consistent with prior findings that highly educated parents tend to raise their children, excluding them from doing housework to allow them to invest in other activities [66]. However, in the context of our study, the effect of mothers' educational level is observed to be positive when mediated by cultural capital. In contrast, paternal education level exerts an indirect negative influence on daughters' daily life skills through cultural capital.

Moreover, fathers' social capital and occupational prestige have direct and indirect negative relations with the communication and socialization domains of daughters attending kindergarten, but not with those attending middle school. Therefore, it seems that for kindergarten girls, the mediation of their fathers' social capital makes the positive effect of fathers' occupational prestige negative. Previous studies have found that the father's occupation is a significant predictor of toddlers' language development [33, 67] and other additional paternal factors, such as time spent at home, playing, teaching, and reading with offspring, impact early children's communication and social skills [67]. However, men invest time in their professional careers [68] and develop a great deal of work-related social capital (i.e., connections with other professionals) [69]. The negative relation between paternal social capital with daughters' adaptive abilities found in the present study may suggest that fathers' social resources are likely to be time-consuming and may result in a reduction of shared activities with daughters. This might have a particular impact on girls attending kindergarten because children rapidly acquire cognitive and social-emotional skills at this age and parenting is essential for shaping their behavior. However, these results must be treated with caution, as the direct effect of fathers' social capital and the moderating effect of school year on the relations between fathers' social capital and daughters' communication and socialization domains were statistically significant only in the post hoc comparisons.

Regarding boys, only positive relations were found between mothers' and fathers' SCL and sons' adaptive behavior domains. Mothers' cultural capital and education level have direct and indirect positive relations with sons'

daily living skills in middle school, but not with those in kindergarten. The results suggest that mothers with elevated cultural capital might be more likely to engage in discourse with their adolescent sons regarding health and personal care, which might contribute to their observed autonomy in these domains. It seems reasonable to hypothesize that this relation may be less pronounced in sons attending kindergarten, potentially due to the strongest involvement of the caregivers in aspects of care and therefore the lesser autonomy expressed. Moreover, mothers' social capital resulted positively related to the communication domain of sons (regardless of their school level) and the socialization domain of middle school boys only. Finally, mothers' occupational prestige did not affect any sons' adaptive behavior domains. However, a reciprocal effect cannot be excluded, meaning that boys with better communication abilities may stimulate their mothers to become more involved with their communities. Similarly, boys with higher social competencies may favor higher mothers' social connections.

Fathers' occupational prestige positively affected the three domains of adaptive behavior of kindergarten sons. As found for girls, high occupational prestige might correspond to higher economic availability that allows the family to let the sons be involved in extra activities that foster their adaptive behavior. Furthermore, this effect might be detected only for the youngest children because, at this age, parents have the highest decisional power over their offspring's extracurricular activities. Thus, fathers with greater financial availability may choose more stimulating activities for their sons than fathers without such availability. Nevertheless, the outcomes pertaining to the communication and socialization domains should be interpreted with caution. This is due to the fact that the direct effect of fathers' occupational prestige and the moderation effect of school year attendance on the relations between fathers' occupational prestige and sons' communication and socialization domains were not statistically significant. Only the post hoc comparisons were found to be significant. No relations were found between the father's educational level, cultural capital, and social capital and their sons' adaptive behavior.

In summary, mothers' SCL relations with their offspring's adaptive behaviors are numerous and generally positive for both daughters and sons. In contrast, fathers' SCL relations are few and primarily negative for daughters and positive for sons. Mothers' educational level and cultural capital and fathers' occupational prestige were related to the adaptive behaviors of both daughters and sons. Mothers' social capital was related only to sons' adaptive behavior, whereas fathers' social capital was related only to daughters' adaptive behavior. Relations with parents' SCL were found for all children's adaptive behavior domains.

These diverse networks of relations between mothers' and fathers' SCL domains and girls' and boys' adaptive behavior domains may be attributable to different gender roles. The mother is generally more involved in the care of offspring [70, 71], especially females [72], and in cultural activities carried out together. Maternal status also influences father's involvement in these activities with children, while paternal status does not seem to have such an impact on mother-child activities [73]. The caregiving and leisure activities shared with offspring may facilitate the transmission of parental values, which may translate into greater adaptive skills. The greater involvement of mothers and their influence on fathers' involvement in shared activities with children may explain the higher positive impact of mothers compared to fathers.

During the transition to adolescence, the ongoing process of identification, the intensification of gender roles, and the communication difficulties that occur [63-65] can widen the distance between children and parents of the opposite sex, especially fathers and daughters. This may explain why maternal, but not paternal, cultural capital has a positive relation with the adaptive behavior of middle school daughters.

The cultural capital of mothers has also been shown to have a positive relation with the daily living skills of their middle-school sons. Mothers generally assume a prominent role in child care, irrespective of gender. In particular, they hold the majority of the responsibility for such tasks as daily care and healthcare [74]. Those who possess significant cultural capital probably show a propensity to foster both sons and daughters' autonomy in these fields. Furthermore, these mothers are more likely to espouse an egalitarian perspective on gender roles, which may serve as a rationale for the observed tendency of their male offspring to demonstrate higher levels of proficiency in domestic tasks.

Social networks may also be shaped by gender norms. Women tend to place greater reliance on informal relationships and to engage in community service and child-focused activities [69, 75]. The type of social capital that emerges from these relationships is likely to involve resources that are more readily shared with offspring, thereby serving as a conduit between them and society. This could account for the observed positive relation of mothers' social capital to communication and socialization skills of middle-school sons. The relation may manifest solely in male children, potentially due to their heightened reliance on maternal social resources compared to female daughters, attributable to their divergent developmental patterns.

Conversely, men tend to prioritize formal and work relationships and demonstrate higher levels of engagement in civic and sports associations [69, 75]. These social relationships, in conjunction with a substantial career engagement,

are likely to result in increased involvement in extra-domestic activities and reduced direct interaction with their children. Indeed, in the present study the paternal occupational prestige showed a positive influence on the adaptive abilities of both daughters and sons. However, when social capital is introduced as a mediating factor, a negative impact is observed on the communication and socialization of kindergarten-aged daughters. These results may be attributable to the reduced engagement of fathers in caregiving activities with their female offspring compared to their male children at this developmental stage [71]. However, to interpret the results of this study correctly, it would be helpful to quantify fathers' time investment and their presence/absence in the family system compared with that of mothers [72].

Future Directions and Limitations

The present study highlights the unique contributions of specific SCL domains of mothers and fathers to particular adaptive behavior domains that are diverse for male and female offspring, outlining a roadmap for future research to better understand the environmental factors contributing to child development. For instance, given the different paths of girls and boys, sibling studies may help understand whether these differences also occur in girls and boys with the same parents. Furthermore, given that this study found some effects only at a specific school level, replicating this research from a longitudinal perspective or involving younger participants (i.e., less than three years old) may clarify the age of onset of a specific pattern of relations. Indeed, previous research has shown that different domains of parental SCL have different relations with adaptive behavior in toddlers [23]. Another limitation is involving children between three and 14 years old only and at a single time point with a cross-sectional quasi-experimental design. When participants cannot be randomly assigned to the levels of the independent variables, as in this case, it is not possible to propose causal inferences and some authors recommend caution in interpreting results of path analysis involving mediation and moderation effects [76]. However, the path models tested in the present investigation rely on a clear theoretical background derived from previous research that found that the educational level and occupational prestige of participants affected their cultural capital and social capital [19, 20].

In addition, this is a secondary data analysis and the samples have some limitations. First, the size of the sample demands caution in interpreting and generalizing the results. Furthermore, the present study was conducted in Northern and Central Italy, regions that generally offer more affluent opportunities for cultural and social engagement compared to Southern Italy and other countries [77, 78]. The regional limitation of the present study may have influenced the

findings, as socioeconomic and cultural factors play a crucial role in shaping the studied phenomena. Consequently, it is essential to collect data from other areas and countries to improve the generalizability of this study's findings. Future research could shed light on similarities and differences on the relations between parents' SCL and offspring's adaptive behavior in case of diverse territorial, social, cultural, or economic contexts.

Some of the findings of this study are challenging to explain (i.e., the negative effects of the school year on some adaptive behavior domains) and require further in-depth analysis. Finally, the rejected alternative path models using the Vineland-II adaptive behavior total Standard Score as the outcome had lower AIC values than the path models with the three Vineland-II domains. However, despite being less parsimonious, the latter had better goodness-of-fit indexes and represented the structure of the adaptive behavior construct.

Implications

Despite these limitations, using advanced statistical methods, this study provides a detailed overview of the unique relations of each domain of mothers' and fathers' SCL with each domain of the adaptive behavior of their male and female offspring, which is useful information for a detailed picture of the factors contributing to child development and for understanding the ways leading to positive family life outcomes.

These results have several relevant implications and practical applications for providers, program implementers, and policymakers. Regarding the negative effect of the attended school year on the socialization and communication domains of both girls and boys, policymakers and teachers should promote activities to improve students' communication and social skills to meet society's increasing demands.

Policymakers should also be aware of the relevance of mothers' cultural interests and activities for developing adaptive behavior of both daughters and sons, especially teenagers. Interestingly, cultural capital, and not educational level, showed this relevance. Cultural capital should be appropriately stimulated to support its continued growth. To this end, policymakers should first deeply support mothers in daily care activities to let them free time for cultural activities, such as attending theater performances or visiting exhibitions or museums. For example, opportunities for these activities should be specially priced and properly disclosed, especially for women with less access. Furthermore, given the relevance of mothers' social capital for the development of their sons' adaptive behavior, energies should also be devoted to supporting and properly divulging and

spreading the activities of community service and cultural groups/associations.

Regarding the negative relation of fathers' social capital with daughters' adaptive behavior, policymakers and kindergarten teachers should pay particular attention to fathers of preschooler daughters to inform them how important it is that they spend time daily interacting with their daughters. Fathers should be active in caring for and playing with their daughters, cultivating common hobbies and interests, more frequently shared with sons. For example, it would be helpful for fathers to have the possibility of reducing working hours for parental leave and have more time to spend with their daughters in daily life activities, such as pick off/up from school, sports, or parties.

Policymakers should establish concrete initiatives to promote parents cultural and social capital through activities with their offspring, such as promoting art courses without participation costs, creating accessible spaces for cultural and social events, also provided with the most advanced technologies (i.e., augmented and virtual reality), and organizing local celebrations to promote the transmission of traditions between generations.

Our findings may also be relevant for girls and boys with special needs. Adaptive behavior is impaired in individuals with intellectual disability and shows specific profiles in those with ADHD, autism spectrum disorder, or other neurodevelopmental disorders (e.g., [1, 79, 80]). Future investigations should replicate the present study with girls and boys with special needs. However, the results of the present study are already useful in suggesting a deeper involvement of parents in early intervention programs focused on the development of adaptive behavior that may affect offspring and family well-being.

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Data Availability The data and code necessary to reproduce the

analyses presented in this paper may be available to the authors upon request. The analyses presented here were not preregistered.

Declarations

Competing Interests The authors declare no competing interests.

Ethical Approval This study was conducted following the ethical standards laid down in the 2013 Fortaleza version of the Declaration of Helsinki, it was a voluntary survey for adults that were not in a vulnerable condition. Written informed consent was obtained from each participant, and their anonymity was guaranteed. The participants did not receive any form of incentive to participate in this study. Given that, being not a clinical study and being the participants not in a vulnerable condition, the present study is not subject to the prior ethical approval of the Ethical Committee in accordance with the Regulation of the European Parliament n. 36/2014.

Consent To Participate Written informed consent was obtained from each participant, and their anonymity was guaranteed.

Consent To Publish Consent for publication was not needed.

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