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# From beliefs to behaviors: parental correlates of mobile device use among children

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***Abstract***

**Context and relevance**. Mobile device use in school-aged children is understudied, especially in relation to family factors, despite Vygotskian perspectives emphasizing social and cultural mediation in development. **Objective**. To examine how parental demographics, attitudes, and behaviors are associated with children's mobile device use during middle childhood. **Hypothesis**. Parents' own device use, beliefs about mobile apps, parental norms, and household structure were hypothesized to be associated with children's mobile use. **Methods and Materials.** A cross-sectional online survey was conducted with 969 Italian parents of children aged 6—10. Measures included sociodemographics, parents' and children's device use, and parental screen norms. Multiple regression analyses were applied. **Results**. Children's use was significantly associated with parents' own device use, parent gender, the presence of older siblings, and parental norms. Parents' positive attitudes were associated specifically with children's smartphone use, whereas parental concerns were weakly negatively associated with smartphone use. Parental norms emerged as the strongest and most consistent correlate across all device types. Lower parental education was associated with greater use of smartphones, tablets, and video game consoles, and lower subjective socioeconomic status was linked to higher tablet use. At the child level, older age was associated with greater smartphone, tablet, and laptop use, whereas boys reported higher use of laptops and video game consoles, and girls higher use of tablets. **Conclusions**. Consistent with Vygotsky's sociocultural theory, children's digital routines appear closely intertwined with individual characteristics, parental beliefs and modeling, and household structures.

***Keywords:*** children, parents, sociocultural theory, mobile devices, screen time

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# От убеждений к поведению: связь родительских установок и поведения с использованием мобильных устройств детьми

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***Резюме***

**Контекст и актуальность**. Несмотря на ключевую роль социального и культурного опосредования в развитии, согласно теории Л.С. Выготского, использование мобильных устройств детьми школьного возраста все еще остается малоизученной областью — особенно в контексте влияния семейных факторов. **Цель**. Изучить, как демографические характеристики, установки и поведение родителей связаны с

использованием мобильных устройств детьми в среднем детстве. **Гипотеза**. Факторами, предсказывающими использование мобильных устройств детьми, являются: использование устройств родителями, их взгляды на мобильные приложения, семейные ценности и правила, а также структура семьи. **Методы и материалы.** Было проведено кросс-секционное онлайн-анкетирование с участием 969 итальянских родителей детей в возрасте от 6 до 10 лет. В рамках исследования собирались сведения о социально-экономических условиях, времени использования устройств, как родителями, так и детьми, а также о правилах родителей по контролю за использованием мобильных устройств. Для анализа данных были применены методы множественной регрессии. **Результаты**. Использование устройств детьми было связано с использованием устройств их родителями, полом родителя, наличием старших братьев или сестер, а также ценностями родителей. Положительное отношение родителей напрямую ассоциировалось с частым использованием смартфонов детьми, тогда как беспокойство родителей имело слабую отрицательную связь с использованием мобильных устройств. Ценности и правила родителей оказались наиболее важными и устойчивыми предикторами для всех видов устройств. Низкий уровень образования родителей связывался с большим временем, проведенным за смартфонами, планшетами и игровыми консолями, а низкий субъективный социально-экономический статус — с более частым использованием планшетов. Более старший возраст детей был связан с увеличением времени использования смартфонов, планшетов и ноутбуков. Также было установлено, что мальчики чаще используют ноутбуки и игровые консоли, а девочки — планшеты. **Выводы**. Опираясь на социокультурную теорию Л.С. Выготского, мы можем сделать вывод о том, что цифровые привычки детей определяются не только их личными характеристиками, но и семейной структурой, убеждениями родителей и подражанием их поведению.

***Ключевые слова:*** дети, родители, социокультурная теория, мобильные устройства, экранное время

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## Introduction

The widespread adoption of mobile devices — such as smartphones, tablets, and video game consoles — has transformed children's everyday environments, raising both concerns and opportunities across developmental fields. Recent data show that 30% of children aged 8—9 own a smartphone, a figure that rises to 70% among 12—13-year-olds and nearly 90% among those aged 14 and older (Rideout, Robb, 2021). In Italy, 51% of 9—10-year-olds use smartphones (Mascheroni, Ólafsson, 2018).

Although extensive research has focused on early childhood, far fewer studies have systematically examined mobile device use in school-age children (6—10 years), despite their growing digital autonomy (Danet, 2020). This study addresses that gap by examining how parents' and children's demographics, together with parents' beliefs and behaviors, are associated with children's use of mobile devices during middle childhood.

This work is grounded in Vygotsky's (1978; 1986; 1987) socio-cultural theory, which emphasizes the formative role of caregivers and cultural tools in child development. As Ivich (2024) argues, digital media — like books or writing systems — can function as "psychological tools," mediating attention, language, and cognition. From this perspective, mobile technologies should not be viewed as inherently harmful or beneficial but rather as cultural artifacts whose developmental impact depends on how they are integrated into socially mediated experiences.

Studies have shown that mobile devices, when used in educational contexts, can enhance literacy, numeracy, and creative thinking (Doron, Derby, 2017; Dorris et al., 2024). Touchscreen tablets, in particular, support early literacy by mimicking traditional learning tools (Neumann, Neumann, 2017). These tools can also foster metacognitive awareness and problem-solving — functions that Vygotsky attributes to internalized social interaction. In this light, digital engagement can represent a form of "artificial development" (Ivich, 2024) when guided by supportive adults.

At the same time, concerns about excessive and poorly regulated screen exposure persist. Research has linked prolonged screen time to decreased academic performance, attention problems, and internalizing and externalizing symptoms (Liu et al., 2022; Miyashita et al., 2023). Physical effects include sedentary behavior and disrupted sleep (Zou et al., 2023). Such risks highlight the need to examine how family context shapes children's digital routines.

Parental characteristics — such as education, income, family structure, and screen habits — are consistently associated with children's technology use (Nagata et al., 2022; Beynon et al., 2024; Tulviste et al., 2024). For example, children from lower-income or less-educated households are more likely to have unsupervised access to devices such as televisions or game consoles (Atkin et al., 2014; Tandon et al., 2012). Maternal screen use has also been shown to be associated with children's screen exposure, even in infancy (Nagata et al., 2025).

Beyond demographics, parental attitudes and beliefs about technology are strongly associated with children's screen time. According to Vygotsky, these attitudes function as culturally mediated psychological tools that guide learning. Parents who view screen time as beneficial may reinforce it through co-use and positive modeling (Chiong, Shuler, 2010; Takeuchi, 2011). Conversely, negative attitudes may result in digital restriction or passive "babysitting" practices (Vandewater, Bickham, Lee, 2006). These differing "digital climates" reflect broader family values and influence how children internalize screen-related behaviors.

Several studies highlight strong associations between parental norms, subjective beliefs, and children's media use. For instance, Lauricella, Wartella and Rideout (2015) and Reid Chassiakos et al. (2016) found that parents' perceived appropriateness of screen time correlates with children's actual media use. Cingel and Krcmar (2013) observed that parents with positive attitudes toward digital media had children with greater screen exposure, especially in early childhood. This suggests that parental beliefs operate independently of structural factors such as age or education.

Guided by Vygotsky's sociocultural theory, we conceptualize parents' internalized beliefs and individual norms regarding children's mobile device use as culturally mediated psychological tools that are transmitted and gradually internalized through everyday interactions. On this basis, the present study examines how these norms, together with parents' and children's demographic characteristics, are associated with children's mobile device use during middle childhood. Building on these considerations, the present study addressed two research questions:

**RQ1:** Are parents' demographic characteristics (e.g., gender, education, perceived socioeconomic status), parents' attitudes toward mobile apps, and children's characteristics (e.g., gender, age, co-residence with one or both parents, presence of older siblings) associated with children's mobile device use?

**RQ2:** Is the amount of mobile device use that a parent believes is appropriate — controlling for child age, parental education, and household composition — associated with children's actual mobile device use?

## Materials and methods

### *Participants and procedure*

The present study employed a cross-sectional design with an Italian convenience sample. Data were collected anonymously via a self-administered online survey, accessible through a link, following informed consent.

Recruitment strategies included collaborations with primary schools and community organizations, as well as dissemination via social media platforms (Facebook, Instagram, and WhatsApp). Inclusion criteria were: (a) residence in Italy; (b) sufficient knowledge of Italian; (c) being a parent of a child aged 6—10 years; and (d) voluntary survey completion with consent for data use in scientific publications. Exclusion criteria included: (a) failure to provide informed consent and (b) incomplete survey responses. No incentives were offered.

Of the 1122 parents initially recruited, 969 (86,4%) met the criteria and completed the survey. The final sample comprised 696 mothers (71,8%) and 273 fathers (28,2%), with a mean age of 43,5 years ($SD$ = 7,18).

### *Measures*

A questionnaire tailored to the local context was developed, drawing on and slightly modifying tools from previous studies. It consisted of four sections:

**Socio-demographic sheet.** Participants reported their age, gender, country of origin, educational level, and perceived social status. Educational levels were coded as follows: 1 = *middle school diploma or less*, 2 = *high school diploma*, 3 = *university degree*, 4 = *doctoral or postgraduate degree*. Perceived social status was measured using the MacArthur Subjective Social Status Scale — Adult Version (Adler et al., 2000), with a 10-rung ladder indicating social standing. Parents with more than one child aged 6—10 were asked to select one and report that child's gender and age, co-residence with one or both parents, and presence of older siblings.

**Child's and parent's mobile device use.** Parents reported their own and their child's daily use of mobile devices (smartphone, tablet, laptop, and video game console), using a time scale ranging from 0 minutes to over 3 hours, with 15- and 30-minute intervals, based on formats used in prior studies (e.g., Cingel, Krcmar, 2013). Responses were converted into minutes for analysis.

**Parents' perceived positive effects and concerns about children's use of apps.** Parents rated both perceived positive effects and concerns using two sets of 5-point Likert scales (1 = *no effect/concern*, 5 = *very high effect/concern*), plus a "Don't know" option. Items addressed five domains: (a) motor development; (b) cognitive development (e.g., attention, reasoning, intelligence, memory); (c) language and communication; (d) social interaction; and (e) emotional understanding and expression. The positive effects scale ($M$ = 14,08, $SD$ = 3,83, $\alpha$ = 0,81) and the concerns scale ($M$ = 12,11, $SD$ = 3,83, $\alpha$ = 0,80) both demonstrated good reliability. Total scores were calculated by summing responses, with higher scores reflecting greater perceived effects or concerns.

**Parental individual norms for children's mobile device use.** Parents indicated the amount of daily screen time they considered appropriate for their child for each device type, using the same time intervals as in the use section.

### *Statistical analysis plan*

Descriptive statistics were first computed for all variables. Correlational analyses were then conducted to examine associations among variables. Finally, two separate sets of regression analyses were conducted to identify variables significantly associated with the outcomes and to address the two research questions. The first examined the influence of parental and child demographic variables and parental attitudes, while the sec-

ond focused on parental individual norms, treated as a distinct and proximal correlate. This approach allowed clearer interpretation of effects and avoided multicollinearity among conceptually related variables.

Given the cross-sectional design, these analyses estimate statistical associations rather than causal effects; accordingly, all results are interpreted as correlational. Data normality was evaluated using skewness and kurtosis indices, following Hair et al. (2010). Multicollinearity was assessed using Variance Inflation Factors (VIF) and tolerance values. All independent variables showed tolerance values above 0,40 and VIF values below 2,00, indicating no concerns with multicollinearity (Hair et al., 2010). Analyses were performed using SPSS Statistics version 26.0.

## Results

### *Participants' socio-demographic characteristics*

Table 1 presents the socio-demographic characteristics of the participants, including gender, age, country of origin, educational level, parental education levels, and perceived social status. The table also reports characteristics of the children, including gender, age, co-residence with one or both parents, and the presence of older siblings.

Table 1

**Socio-demographic characteristics of parents and their children**

| Parameters | *n* | % | *M* | *SD* |
|---|---|---|---|---|
| *Parent gender* | | | | |
| Father | 273 | 28,2 | | |
| Mother | 696 | 71,8 | | |
| *Parent's age* | | | 43,5 | 7,1 |
| 28—35 years | 158 | 16,3 | | |
| 36—43 years | 391 | 40,4 | | |
| 44—51 years | 244 | 25,2 | | |
| 52—60 years | 176 | 18,2 | | |
| *Parent's country of origin* | | | | |
| Italy | 871 | 89,9 | | |
| Other country | 98 | 10,1 | | |
| *Parent's educational level* | | | 2,1 | ,9 |
| Middle school diploma or less | 262 | 27,0 | | |
| High school diploma | 433 | 44,7 | | |
| University degree | 187 | 19,3 | | |
| Doctoral or postgraduate degree | 87 | 9,0 | | |
| *Perceived social status* | | | 5,6 | 1,3 |
| Very Low (1—2) | 6 | ,6 | | |
| Low (3—4) | 177 | 18,3 | | |
| Moderate (5—6) | 551 | 56,9 | | |
| High (7—8) | 224 | 23,1 | | |
| Very High (9—10) | 11 | 1,1 | | |
| *Child characteristics* | | | | |
| Gender | | | | |
| Male | 429 | 44,3 | | |
| Female | 540 | 55,7 | | |
| Age | | | 8,27 | 1,5 |
| 6 years | 160 | 16,5 | | |
| 7 years | 170 | 17,5 | | |
| 8 years | 176 | 18,2 | | |
| 9 years | 178 | 18,4 | | |
| 10 years | 285 | 29,4 | | |
| Co-residing with | | | | |
| Two Parents | 774 | 79,9 | | |
| One Parent | 195 | 20,1 | | |
| Co-residing older siblings | | | | |
| Yes | 569 | 58,7 | | |
| No | 400 | 41,3 | | |

*Note:* «*n*» — sample size; «*M*» — mean; «*SD*» — standard deviation.

***Findings on children's and parents' use of mobile devices***

Participants reported their own average daily use of mobile devices, as well as that of their child. According to parents' reports, 642 children (66,3%) use smartphones, 599 (61,8%) use tablets, 522 (53,9%) use laptops, and 513 (52,9%) use video game consoles. On average, children use smartphones for 39,4 minutes per day (*SD* = 46,10), tablets for 37,4 minutes (*SD* = 43,6), laptops for 22,1 minutes (*SD* = 28,9), and video game consoles for 31,0 minutes (*SD* = 42,4).

Only three parents reported not using a smartphone; 966 (99,7%) indicated regular use. Additionally, 486 parents (50,2%) reported using a tablet, 909 (93,8%) used a laptop, and 305 (31,5%) used a video game console. On average, parents used smartphones for 106,8 minutes per day (*SD* = 38,8), tablets for 26,9 minutes (*SD* = 38,9), laptops for 41,6 minutes, and video game consoles for 10,9 minutes (*SD* = 18,1).

***Correlations among the study variables***

Table 2 reports correlations among the main study variables, based on composite indices of total child and parent mobile use, and total parental norms (mean scores across smartphone, tablet, laptop, and video game console use).

***Associations between parents' demographic characteristics, attitudes toward apps, and children's characteristics and children's mobile device use (RQ1)***

To address RQ1, four simultaneous multiple regression analyses were conducted — one for each device type — following an examination of the correlations among the variables. Only children who were reported to use a given device were included in the corresponding analysis. As shown in table 3, the regression results revealed significant associations between parents' and children's demographic characteristics, their attitudes toward children's use of mobile technology, and children's actual use of such devices.

***Associations between parental norms and children's mobile device use (RQ2)***

To explore RQ2, a series of multiple regression analyses were conducted. As shown in table 4, individual parental norms regarding mobile device use were significantly associated with children's actual use across all device types, even when controlling for child age, parental education, and household composition. The strongest associations were observed for smartphones ($\beta$ = 0,58) and tablets ($\beta$ = 0,43), followed by video game consoles ($\beta$ = 0,24), and laptops ($\beta$ = 0,22).

Table 2

**Zero-order correlations among the main study variables**

| Parameters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Child's device use[a] | — | | | | | | | | | | | |
| 2. Parent's device use[a] | 0,26** | — | | | | | | | | | | |
| 3. Individual norms about the use of mobile device[a] | 0,41** | 0,08** | — | | | | | | | | | |
| 4. Parent's gender | –0,22** | –0,31** | –0,07* | — | | | | | | | | |
| 5. Parent's educational level | –0,07* | –0,10** | –0,22** | –0,05 | — | | | | | | | |
| 6. Perceived social status | 0,04 | –0,01 | –0,07* | –0,11** | –0,12** | — | | | | | | |
| 7. Child's gender | –0,18** | –0,01 | –0,20** | –0,01 | 0,16** | –0,05 | — | | | | | |
| 8. Child's age | 0,19** | 0,07* | 0,39** | –0,08* | –0,03 | 0,02 | –0,01 | — | | | | |
| 9. Number of parents co-residing with the child | –0,16** | 0,02 | –0,06 | –0,07* | 0,07* | –0,24** | –0,03 | –0,20** | — | | | |
| 10. Co-residing older siblings | 0,23** | –0,01 | 0,31** | –0,01 | 0,14** | 0,02 | –0,23** | 0,11** | 0,03 | — | | |
| 11. Perceived positive effect | 0,31** | –0,03 | 0,38** | 0,09** | –0,05 | –0,09** | –0,15** | 0,07* | 0,01 | 0,30** | — | |
| 12. Concerns | –0,19** | –0,01 | –0,05 | –0,04 | 0,04 | 0,07* | –0,07* | –0,03 | 0,17** | –0,11** | –0,07 | — |

*Note:* «a» — Composite indices represent total child and parent mobile use and total parental norms, computed as the mean of smartphone, tablet, laptop, and video game console use; «*» — correlation is significant at the 0,05 level (two-sided); «**» — correlation is significant at the 0,01 level (two-sided).

Table 3

**Regression analyses of demographic variables and parents' attitudes toward mobile apps in relation to children's time on mobile devices (standardized coefficients)**

| Parameters | Smartphone[a] | Tablet[b] | Laptop[c] | Video game console[d] |
|---|---|---|---|---|
| Parent gender | –0,21*** | –0,14*** | 0,01 | 0,02 |
| Parent's educational level | –0,16*** | –0,20*** | –0,06 | –0,09 |
| Perceived social status | 0,07 | –0,17*** | –0,03 | –0,04 |
| Number of parents co-residing with the child | –0,13*** | –0,05 | –0,08 | –0,18*** |
| Co-residing older siblings | 0,25*** | 0,13*** | 0,15** | 0,22** |
| Parent's mobile device use | 0,19*** | 0,54*** | –0,03 | 0,14** |
| Perceived positive effects | 0,19*** | 0,06 | –0,06 | 0,03 |
| Concerns | –0,08* | 0,03 | 0,03 | –0,01 |
| Child gender | 0,06 | 0,07* | –0,16** | –0,29*** |
| Child age | 0,17*** | 0,07* | 0,19*** | –0,06 |
| $R^2$ | 0,35 | 0,43 | 0,12 | 0,21 |

*Note*: «a» — *n* = 642; «b» — *n* = 599; «c» — *n* = 522; «d» — *n* = 513; Parent/child gender: 0 = male; 1 = female; «*» — correlation is significant at the 0,05 level (two — sided); «**» — correlation is significant at the 0,01 level (two-sided); «***» — correlation is significant at the 0,001 level (two — sided).

Table 4

**Regression analyses of parental norms in relation to children's time on mobile devices (standardized coefficients)**

| Parameters | Smartphone[a] | Tablet[b] | Laptop[c] | Video game console[d] |
|---|---|---|---|---|
| Child's age | 0,06 | –0,01 | 0,11* | –0,05 |
| Parent's educational level | –0,08* | –0,12** | –0,01 | –0,16*** |
| Number of parents co-residing with the child | –0,12*** | –0,02 | –0,08 | –0,09* |
| Individual norms about the use of mobile devices | 0,58*** | 0,43*** | 0,22*** | 0,24*** |
| $R^2$ | 0,41 | 0,22 | 0,10 | 0,11 |

*Note:* «a» — *n* = 642; «b» — *n* = 599; «c» — *n* = 522; «d» — *n* = 513; «*» — correlation is significant at the 0,05 level (two-sided); «**» — correlation is significant at the 0,01 level (two — sided); «***» — correlation is significant at the 0,001 level (two-sided).

## Discussion

### *Factors associated with increased mobile device use among children (RQ1)*

Overall, our findings reveal significant variations in how parental demographics and attitudes, along with children's characteristics, are linked to differences in the frequency and type of mobile device use among children. Notably, the presence of older siblings was strongly associated with the use of every device examined, likely due to modeling behavior or shared device use. This finding aligns with previous studies indicating that having siblings can facilitate earlier and more autonomous access to digital technology (Alder, Elias, 2025; Papadakis, Zaranis, Kalogiannakis, 2019) and can be interpreted within Vygotsky's notion of the Zone of Proximal Development. Through co-use, demonstrations, and shared play, older siblings likely provide social scaffolding that enables children to perform digital activities they could not yet manage independently, thereby accelerating their digital competencies.

Furthermore, parents' own use of mobile devices was significantly associated with increased use of smartphones, tablets, and video game consoles by their children. However, no such association was found for laptops. This pattern suggests that children are more likely to model parental behaviors involving devices commonly used for entertainment or informal communication — such as smartphones and tablets — rather than laptops, which may be used more privately or for work-related tasks, and thus are less visible or engaging for imitation. In line with this, parents' positive attitudes toward mobile apps were associated with greater child use of smartphones, whereas no significant associations emerged for tablets, laptops, or video game consoles, underscoring the specific role of parental beliefs in reinforcing smartphone use. Conversely, parental concerns were weakly but significantly negatively associated only with smartphone use, suggesting that heightened concern may be linked to slightly lower levels of children's smartphone use.

However, this pattern appears weaker than the stronger associations with parental modeling and positive beliefs. Taken together, these results are consistent with previous literature highlighting the strong associations between parents' attitudes and practices and children's digital engagement (Griffith, 2023; Lee, Kim, Kim, 2022).

Parent gender was also significantly associated with children's device use: mothers reported lower smartphone and tablet use by their children compared to fathers, which may reflect differences in mediation styles

and technology-related norms across maternal and paternal roles. This finding aligns with previous studies. For instance, Valcke et al. (2010) found that mothers were more likely to adopt restrictive and authoritative mediation approaches — characterized by both high control and emotional warmth — in their regulation of children's internet use. Similarly, Livingstone (2007), in a UK-based study, reported that children perceived rules and controls set by mothers as stricter and more consistent than those set by fathers, who tended to engage in more passive or distant supervision strategies.

The combined influence of parents and older siblings on children's mobile device use aligns closely with Vygotsky's sociocultural theory, which emphasizes learning as a socially mediated process. Parents, through their own device use and positive attitudes, function as key models and mediators, structuring access to technology and the implicit norms governing its use. Their behaviors provide children with opportunities for observational learning and shared activity, facilitating the internalization of digital tools as part of the developmental environment. At the same time, older siblings act as more capable peers within the child's Zone of Proximal Development, supporting the acquisition of new digital skills through co-use, demonstration, or imitation. This dual scaffolding — by adults and more experienced peers — illustrates how children's digital habits are co-constructed in everyday interactions, advancing their development through socially guided engagement with technology.

Lower parental education levels were associated with greater use of smartphones and tablets by children, suggesting that in families with fewer educational resources, mobile devices may play a more central role in children's daily routines. This finding aligns with broader research indicating that higher parental education is associated with more regulated or delayed media exposure (Cingel, Krcmar, 2013; Jiménez-Morales, Montaña, Medina-Bravo, 2020; Pons, Bennasar-Veny, Yañez, 2020). For instance, Jiménez-Morales, Montaña and Medina-Bravo (2020) found that children of mothers with lower educational levels and occupational status were more likely to consume content via smart devices. Similarly, Pons, Bennasar-Veny and Yañez (2020) showed that maternal education was inversely related to children's recreational screen time, with both direct and indirect effects mediated by family environmental factors.

Parental perceived socioeconomic status showed a significant negative association with children's tablet use, but was unrelated to smartphone, laptop, or video game console use. This partly contrasts with previous findings in the literature, which more consistently report socioeconomic differences in children's engagement with digital media. One possible explanation is that subjective social perceptions may not capture the structural and material conditions influencing children's media habits as effectively as objective indicators such as income or education. For example, Koivusilta, Lintonen, and Rimpelä (2007) found that adolescents from lower-income families used mobile phones more frequently than their more advantaged peers. Similarly, Tandon et al. (2012) reported that children from low-income households had greater access to electronic media like televisions, DVD players, and video games, but less access to physical play equipment. Pons, Bennasar-Veny, and Yañez (2020) also showed that lower maternal education was associated with greater recreational screen time, both directly and through mediating family factors. These discrepancies highlight the potential limitations of relying solely on self-perceived social status measures in predicting digital media use among children.

The number of parents in the household was significantly associated with children's smartphone and video game console use, with children from single-parent households showing higher levels of use. No such associations were observed for tablets or laptops. This pattern may reflect greater reliance on accessible entertainment technologies in single-parent families, possibly due to fewer resources for alternative activities or less time for joint supervision. In two-parent households, by contrast, device use may be more diversified or more strictly monitored, particularly for devices like video game consoles that are often subject to parental regulation. Prior research supports this interpretation: Cingel and Krcmar (2013) found that children in single-parent homes consumed more educational and non-educational media overall, while Gentile and Walsh (2002) noted that children of unmarried parents spent more time with screen media. Additionally, Livingstone (2003) observed that computer use is often more purpose-driven and regulated in families with greater parental involvement, which may explain the relatively lower use of certain entertainment-oriented devices in two-parent households.

Finally, the results show that among child-level characteristics, age and gender are significantly associated with device use. Specifically, older children are more likely to use smartphones, tablets and laptops, suggesting developmental factors and increasing autonomy in digital engagement (Choi, King, Duerden, 2023; Cingel, Krcmar, 2013; Pew Research Center, 2020). In terms of gender, boys are significantly more likely than girls to use laptops and video game consoles, whereas girls show greater use of tablets. These patterns reflect both normative developmental trajectories and gendered media preferences, as stated in previous research (Chang, 2025; Pew Research Center, 2020).

### *Parental norms and children's actual mobile device use (RQ2)*

The findings clearly demonstrate that parents' individual norms regarding appropriate mobile device use are the strongest and most consistent correlates of children's use across all device types — particularly for smartphones and tablets, where the effects are largest. This observation aligns with prior research: Cingel and Krcmar (2013) found that positive parental attitudes and perceived norms about preschool media use were strong predictors of children's actual screen time, outweighing concerns or negative attitudes. Our results suggest that parents' internalized beliefs — what Vygotsky would conceptualize as culturally mediated psychological tools — appear to play a foundational role in shaping children's digital routines. These norms are

expressed not only through explicit rules but also enacted via co-use, access decisions, and modeling behaviors. From a Vygotskian perspective, this reflects how higher psychological functions are socially constructed: parents mediate between cultural expectations and children's cognitive development, providing a framework within which children learn to use digital tools. Extending previous findings, our study indicates that these internalized norms remain strongly associated with media use well beyond the preschool years, underscoring the enduring role of mediated learning and scaffolding in digital contexts.

The inverse associations between parental education level and children's use of smartphones, tablets, and video game consoles suggest that parents with higher educational attainment are more likely to regulate their children's access to digital devices. This aligns with prior studies indicating that higher-educated parents tend to impose more structured and intentional media environments, promoting educational content while restricting recreational screen time (Calvert et al., 2005; Rideout, Hamel, 2006). Similarly, the significant negative effect of the number of co-residing parents — observed for smartphone and video game console use — suggests that children in two-parent households may experience more shared supervision, coordinated limit-setting, or diversified access to digital resources. Previous findings (Cingel, Krcmar, 2013) also show that children from single-parent households tend to consume more screen media.

Interestingly, child age was unrelated to smartphone, tablet, and video game console use, but it was significantly associated with greater laptop use. This partly contrasts with much of the developmental literature, which often emphasizes age-related increases across multiple device types. The selective association with laptops may reflect that these devices are more closely tied to schoolwork and educational purposes, which naturally expand with age. From a Vygotskian perspective, this pattern underscores that development is not solely driven by age-based maturation, but by the socially organized environment — especially shaped by parents' norms, beliefs, and behaviors — that guides children's engagement with mobile technologies (Vygotsky, 1978).

Taken together, these findings reinforce the idea that parental norms and structural household factors act as sociocultural tools in Vygotsky's sense, regulating not only access to mobile devices but also the broader developmental context in which digital competence is formed. Parents do not merely allow or restrict access — they mediate and model technology use, shaping the child's digital development through guided participation and culturally rooted expectations.

## Conclusions

This study investigated associations between parental demographics, attitudes, individual norms, and mobile device use among school-age children, addressing two central research questions. The results demonstrate that children's digital routines are not merely the outcome of individual characteristics such as age or gender, but emerge from a complex interplay of parental behaviors, household structures, and normative beliefs. Parents' own device use and their internalized norms were consistently associated with children's use across device types, while parents' positive attitudes toward mobile apps were specifically associated with greater smartphone use. Lower parental education was also linked to greater use of smartphones, tablets, and video game consoles, and the presence of older siblings significantly contributed to children's engagement, reinforcing the social scaffolding of digital practices.

Overall, the results largely, though not fully, confirm the hypotheses outlined in the introduction, with some expected associations only partially supported. In particular, they underscore the central role of parents' own device use and their internalized norms, and they align with Vygotsky's sociocultural theory, which emphasizes that children's development is mediated by cultural tools and social interactions. Within this framework, parents and siblings act as cultural mediators who guide children's engagement with technology in everyday routines, contributing to the ways in which digital tools are integrated into children's developmental experiences.

The significance of this research lies in highlighting mobile technologies as psychological tools whose impact depends on the social and cultural environments in which they are embedded. Beyond developmental psychology, these findings speak to broader debates on digital literacy, equity in educational opportunities, and the intergenerational transmission of cultural practices in the digital age.

**Limitations.** Despite its contributions, this study has several limitations. First, the use of a convenience sample of Italian parents of 6—10-year-old children — predominantly mothers — limits the generalizability of the findings. As such, the results reflect cultural norms and family structures specific to this context, and caution is warranted when extrapolating them to families in other cultural, linguistic, or socioeconomic settings, where patterns of mobile device access and parental mediation may differ. Moreover, reliance on self-reported data may introduce social desirability and recall biases, and the use of self-perceived social status may not adequately capture objective socioeconomic conditions influencing children's mobile device use. In addition, the cross-sectional design precludes causal inferences; accordingly, the relationships observed should be interpreted as correlational associations rather than causal effects. Finally, the absence of direct behavioral measures of children's media use represents a further methodological constraint.

Future research should consider longitudinal approaches to explore how parental norms and family dynamics influence children's digital trajectories over time. In addition, integrating observational or device-tracking data could provide a more accurate and nuanced picture of children's digital practices. Cross-cultural comparisons could further illuminate how socio-cultural contexts modulate the relationship between parental mediation and children's technology use.

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Mauro Croce — ideas; control over the research; writing — review and editing; supervision of the research.

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Паоло Боццато — идеи; планирование исследования; аннотация, написание и оформление рукописи; сбор и анализ данных; применение статистических методов для анализа данных.

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Все авторы участвовали в обсуждении результатов и одобрили окончательный текст рукописи.

***Conflict of interest***

The authors declare no conflict of interest.

***Конфликт интересов***

Авторы заявляют об отсутствии конфликта интересов

***Ethics statement***

According to the regulations of the University of Insubria and national legislation, ethical approval was not required for anonymous survey research that does not collect identifiable personal data. Written informed consent for participation in this study was obtained from all the participants.

***Декларация об этике***

Согласно правилам Университета Инсубрии и национальному законодательству, для анонимных опросов, в которых не собираются личные данные, не требуется получать отдельное этическое одобрение. Все участники исследования дали свое письменное согласие на участие.

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