PIXEL-BIT
e-ISSN: 2171-7966
REVISTA DE MEDIOS Y EDUCACIÓN
MEDIA & EDUCATION JOURNAL

Types of parental mediation and problematic mobile phone use in third grade Primary School pupils

Tipos de mediación parental y uso problemático del móvil en escolares de tercer ciclo de Educación Primaria

Dr. Antonio Daniel García-Rojas
Profesor Titular de Univerisdad. Universidad de Huelva. España

Dra. María del Pilar Gutiérrez-Arena
Profesora Contratada Doctora. Universidad de Córdoba. España

Dr. Ángel Hernando-Gómez
Profesor Titular de Universidad. Universidad de Huelva. España

Cinta Prieto-Medel
Doctoranda. Universidad de Huelva. España

Received: 2024-04-25; **Reviewed:** 2024-09-10; **Accepted:** 2025-01-29; **Preprint:** 2025-02-27; **Published:** 2025-05-01

ABSTRACT

Nowadays, the possession and use of mobile phones by minors comes at increasingly early ages, and supervision and regulation by families is increasingly necessary. Parental mediation is an additional competence to be learned and put into practice. Using a quantitative, descriptive, non-experimental, correlational and multivariate methodological design, a study was carried out with a sample of 273 students in the final cycle of primary education. Significant differences were found between the independent variables and the types of parental mediation: sex/gender only influences active mediation; the father's course and studies have an impact on technical mediation; device ownership affects co-use and the mother's level of studies has an impact on all types of parental mediation. Regarding problematic smartphone use, it is observed that having one's own phone, the time spent using it daily and the mother's level of education are determining factors. The need to train families in parental mediation in order to reduce and avoid the possible risks involved in the use of mobile devices by minors is evident.

RESUMEN

En la actualidad, cada vez es más precoz la tenencia y uso del móvil por parte de menores, y más necesaria la supervisión y regulación por parte de las familias. La mediación parental es ahora una competencia más, que se debe aprender y poner en práctica. Mediante un diseño metodológico cuantitativo, descriptivo, no experimental, correlacional y multivariante, se realizó un estudio con una muestra de 273 estudiantes de último ciclo de Educación Primaria. Se encontraron diferencias significativas entre las variables independientes y los tipos de mediación parental: el sexo influye únicamente en la mediación activa, el curso y los estudios del padre impactan en la mediación técnica, la tenencia de dispositivo afecta al co-uso y el nivel de los estudios de la madre repercute en todos los tipos de mediación parental. Con respecto al uso problemático del móvil, se observa que tener móvil propio, el tiempo de uso diario y el nivel de estudios de la madre son determinantes. Se evidencia la necesidad de formar a las familias en mediación parental para reducir y evitar los posibles riesgos que conlleva el uso del dispositivo móvil por parte de menores.

KEYWORDS · PALABRAS CLAVES

Parental mediation; ICTs; smartphone; problematic uses; Primary Education
Mediación parental; TIC; smartphone; usos problemáticos; Educación Primaria

1. Introduction

According to the latest data available from the National Institute of Statistics (INE, 2022), the percentage of children between 10 and 15 years old who have their own mobile phone is 68.7% (21.6% 10 years old, 44.7% 11 years old and 67.5% 12 years old) and those who use the Internet from home are 97% (92.5% 10 years old, 96.6% 11 years old and 95.9% 12 years old). These data evidence the increasingly widespread use of the Internet by children, via their own mobile phones, at ever younger ages.

Beyond the figures, in a hypermedia society where the indiscriminate use of multiple screens predominates from increasingly younger ages, the responsibility of families to educate children in the use and consumption of the mobile devices they use at home is patently obvious. The family plays a decisive role, and not only with this educational task, as they must also have the minimum knowledge that the situation demands.

This is why it is necessary to know how families are educated about the use of mobile phones, in particular the type of parental mediation available to minors and whether this influences their problematic smartphone use.

One notable work on the issue was carried out by Jiménez-Morales *et al.* (2020), highlighting the level of studies and the professional profile of the parents and their direct influence on the consumption of content from mobile devices by their children. These authors state that parents' low level of education, together with a lower professional category, is linked to greater freedom for schoolchildren when using mobile phones.

In turn, Solera-Gómez *et al.* (2022), concluded that girls are more avid smartphone users and present more problematic uses than boys, and also reported that around 90% of 11 to 15-year-olds have their own devices with an Internet connection and, at the same time, a lack of parental control.

1.1. Problematic smartphone use

In our society, there is already a notable precocity in the use and possession of smartphones, while the task of supervision and mediation by the main caregivers is scarce. (Sola Reche *et al.* 2019). As noted by González-Sanmamed *et al.* (2023) or González Isasi and Medina Morales (2018), the use of mobile devices can bring benefits and opportunities in terms of educational utility, learning acquisition and the positive entertainment they can provide, but they can also create dangers. Children can encounter many problems when interacting with their favourite device, which, according to the Association for Media Research (AIMC, 2019), is the smartphone.

The fact that vulnerable children are attracted to screens is nothing new, and as a plus point, based on what is stated by Besolí *et al.* (2018), primary school pupils have fewer problematic uses than those in secondary and baccalaureate/high school education. However, this does not mean that they are free of them. But what problems could be caused by inappropriate mobile phone use?

Although the most frequently mentioned consequences are cyberbullying (Wright *et al.* 2021), addictive disorders (Menéndez-García *et al.* 2020), nomophobia and the new uses of mobile phones have promoted transformations in the identity of users and can even cause economic repercussions paid for by parents (Carbonell *et al.* 2012).

As observed in García-Rojas *et al.* (2023), this digital tool, within the reach of schoolchildren, can lead to social isolation, reduced leisure and sporting activities, disrupted mealtimes and bedtimes, and poorer academic performance. On school performance, Milková *et al.* (2018) detected that in classrooms that pupils' smartphone addiction leads to inattention to school sessions and continuous distractions.

Likewise, Olivella-Cirici *et al.* (2023), cited problems such as deterioration of family relationships, anxiety and/or depression due to concerns about self-presentation on social networks, insomnia, sedentary lifestyles and multiple addictions. This is compounded by the findings of García-Oliva *et al.* (2017), which incorporate problems related to untrammelled Internet access. On the one hand, gambling and online shopping and, on the other hand, the search for erotic websites and the viewing of sexual content. Focusing on teenagers, De la Villa Moral and Suárez (2017) point to problems in relational and communicative uses, highlighting the lie about the time spent on mobile phones and the management of stress in a significant way.

In proportion, according to Santana-Vega *et al.* (2019), the greater the time and frequency of use, the more problematic uses that may occur, which may include a phobia of feeling excluded and the decline of filial-parental communication. For all these reasons, we can affirm the importance of parental control over the physical possession of mobile phones by minors, with family support and supervision being essential to confront the dark and troubling side of their use.

1.2. Parental mediation

In this world of multi-screens and hyper-connectivity, being a 21st century parent or caregiver of a child brings new skills, and as noted by Tartakowsky *et al.* (2023), parental mediation, both face-to-face and virtual, is now one more parental competence to put into practice.

Although in the scientific literature the main focus is on the adolescence stage, according to Grané I Oró (2021), families should also accompany their children from early childhood and raise them taking into account the digital and mediatised context in which they grow and develop.

Faced with this new role as mediators, as stated by Condeza *et al.* (2019), most legal guardians —more mothers than fathers— face the challenge of media literacy, a reality that did not exist in their childhood years and for which they begin to implement a series of strategies and measures, some of which are based on rewards and punishment.

In terms of strategies, according to Martínez *et al.* (2020), Spanish families opt more for enabling strategies, i.e. those that have a "fundamentally communicative nature and promote or help children's Internet safety" (p.70), and also show greater control over girls' use of ICTs than that of boys.

In line with the above, we find the parental mediation styles worked on by Bartau-Rojas *et al.* (2020), who highlight the tendency towards the instructive style (advising, explaining the workings and reminding of the rules) and mention another quite frequent approach, the shared style (witnessing the use, jointly using the device without introducing criticism or commenting on its effects and supervising the end of use).

Regarding measures to regulate the use of smartphones by children in primary education, according to Muñoz-Carril *et al.* (2023), the choice and setting of a timetable together with restriction by means of passwords and establishing limits on Internet use are highlighted.

With regard to the types of parental mediation, we can highlight the four types of mediation identified by López Castro *et al.* (2021) in relation to the use of these regulation, control, communication and support strategies and measures (p.97):

- Negligent parental mediation (low degree of regulation-control and communication-support)
- Permissive-indulgent parental mediation (low degree of regulation-control, but high communication-support)
- Restrictive-authoritarian parental mediation (high degree of regulation-control, but low degree of communication-support)
- Democratic parental mediation (high degree of regulation-control and communication-support)

In the light of all this, a distinction must also be made between different family models in relation to this issue, as not all parents play this role in the same way. Thus, the categorisation provided by Torrecillas-Lacave *et al.* (2017) is that of "absent concerned, guiding concerned, permissive concerned and controlling concerned" (p. 669).

On the effects of these types of family intervention in relation to children's smartphone use, following Pérez-Sánchez and Brenes-Peralta (2022), we can highlight the favouring of good use (mainly through active mediation) and the consequent inhibition of inappropriate use (usually through monitoring).

The relationship between parental mediation practices and the problematic use of digital devices has been addressed by different authors in the international scope. In the case of Sada Garibay *et al.* (2024), a connection was found with children's commercial content consumption behaviour, the level of parental knowledge about advertising and the type of mediation, with the most informed children applying better strategies to mediate.

For their part, Efrati *et al.* (2024) showed that children's inappropriate use improves when there is greater communication from mothers about smartphone use, parental support and shared use by everyone. This is backed in the study by Huang *et al.* (2024), who also claim that the child-parent communication strategy moderates schoolchildren's self-control and reduces dependence on the devices in question. Moreover, Erus *et al.* (2025) highlighted the importance of parental roles and practices after revealing that undesirable smartphone use has a negative correlation with conscious parenting and subjective vitality, while it has a positive correlation with parental stress. However, Bartau-Rojas *et al.* (2018) noted that families' perception of their children's use of mobile phones —enrolled in primary education— is particularly tinged with pessimism and that there is a shared difficulty in encouraging responsibility and criticism of content consumption.

For this reason, and for proper mediation to take place, it is necessary that families become aware of the risks and possible problematic usage that may arise from screen exposure, take an interest in it and train themselves —perfecting their digital skills and their

media and parental competence— in order to learn or improve the management of devices in their homes (Poyato López *et al.* 2023; Ramírez-García *et al.* 2020).

1.3. Objectives

The aim of this study is to investigate the type of parental mediation available to pupils in the third cycle (3rd grade) of primary education in relation to the use of mobile devices at home, and whether this, together with sex, year, parents' level of studies, whether or not they own their own mobile or how much time they use it per day, are predictive variables of children's problematic use of smartphones.

The hypotheses that can be derived from this second objective are linked to the factors listed below: 1) Sex, year and parents' level of education are explanatory factors for problematic mobile phone use; 2) Having one's own smartphone or not, as well as the length of time spent using it daily are factors associated with children's problematic mobile phone use;3) The type of parental mediation exercised by families and perceived by children is a factor that could explain children's problematic smartphone use.

2. Methodology

The methodological design is quantitative, descriptive, non-experimental, correlational and multivariate. There is no manipulation of the variables.

Non-probabilistic, casual convenience type sampling was carried out. The sample consisted of 273 students in the last cycle (third grade) of Primary Education in the province of Huelva. The descriptive variables of the sample are shown in Table 1.

The research technique used was the survey and the data gathering instrument was the questionnaire, which included socio-demographic variables such as sex, course year, and parents' educational level. Two tests were also included:

- Types of parental mediation (dichotomous yes/no and don't know questions). Questions on the perception of parental knowledge of the child's actions on the Internet. Four types are distinguished: Mediation designated co-use, which includes all activities that are carried out with media and shared between parents and children; active Internet safety mediation, where parents explain and discuss the content of the media their children access; monitoring, mediation that focuses on checking or reviewing children's online activities; and technical mediation, which consists of restricting online content or time spent online by applying technical bans or filters. This is adapted by Ramírez and Gómez (2020) from a questionnaire, the EU kids online II, developed by Livingstone and Haddon (2009), applied in 21 countries within the European Union framework.
- Problematic smartphone use (5 levels, from strongly disagree to strongly agree), scale adapted to Spanish by López-Fernández *et al.* (2012) of the Mobile Phone Problem Use Scale by Bianchi and Phillips (2005), where experts were involved in a series of phases to achieve cultural and semantic equivalence of the tool, thus ensuring the original validity of the instrument. This scale has been widely used to

detect problematic mobile phone use in minors, for example, by Ruiz de Miguel *et al.* (2021).

Table 1

Descriptive variables of the sample

Variables			Frequency	Percentage
Sex		Male	144	52.7
		Female	128	46.9
		Other	1	0.4
Course		Primary 5	110	40.3
		Primary 6	163	59.7
Education level	Primary	Father	9	3.3
		Mother	3	1.1
	Compulsory Secondary Education (ESO)	Father	17	6.2
		Mother	19	7
	Baccalaureate	Father	17	6.2
		Mother	17	6.2
	Intermediate VT	Father	13	4.8
		Mother	10	3.7
	Advanced VT	Father	21	7.7
		Mother	22	8.1
	University	Father	83	30.4
		Mother	98	35.9
	Don't know	Father	113	41.4
		Mother	104	38.1

The reliability of these tests in the present research are expressed in Table 2. An acceptable value of reliability through the omega coefficient should be between.70 and.90 (Campo-Arias & Oviedo, 2008), although in some circumstances values higher than.65 can be accepted (Katz, 2006). The questionnaire was forwarded to the participating schools in digital format. The data collected were processed with the SPSS v.29 statistical program and the degree of statistical validity was placed at $p<.05$. The non-normality of the responses made it advisable to use non-parametric tests in the data analysis. Relationships between variables were analysed using Spearman's bivariate correlations. Finally, the ability of the variables to predict problematic smartphone use was analysed by applying Multiple Linear Regression (MLR) considering compliance with the regression assumptions (Pardo & Ruiz, 2005).

Table 2

Test reliability analysis

Tests	MacDonald's omega	Nº of items
Parental mediation types in smartphone use Ramírez and Gómez (2020)	.694	19 items
Problematic smartphone use López- Fernández *et al.* (2012)	.901	27 items

3. Analysis and Results

When asked if they had their own smartphone, 77.3% answered yes and 22.7% answered no. Some 24.5% regularly use their mobile phone for between 0 and 30 minutes a day, 29.3% for between 30 minutes and one hour, 33% for between one and three hours and 13.2% for more than three hours.

A descriptive analysis of the two tests was carried out for both tests. First, the problematic use of smartphones by children (table 3). For the classification of problematic use, we chose the statistical criterion used in the research by López-Fernández *et al.* (2012) and based on the 15th, 80th and 95th percentiles, which would delimit occasional, habitual, at-risk and problematic users, respectively (Chow *et al.*, 2009).

In this case, the percentiles correspond to the EUPTM scores PC15=42; PC80=73 and PC95=92. Thus, 19.5% of students are at risk, to a greater or lesser extent, for problematic use of mobile devices, even though they are still just beginning to use them.

Table 3

Classification of subjects in terms of problematic use of mobile devices

	Frequency	Percentage
Occasional user	48	17.6
Habitual user	172	63
At-risk user	40	14.7
Problematic user	13	4.8
TOTAL	273	100

On the other hand, regarding the type of parental mediation (table 4) exercised by families in relation to smartphone use, it can be seen that parents, within the co-use dimension, 48.4% of families talk to their children about what they do on the Internet, although they do not sit with them while they are using the mobile device (29.3%). Families seem to actively mediate Internet safety, with percentage values above 60% in all cases. In the case of monitoring, parents do not usually check the websites they have visited (30.4%), whereas this is not the case with e-mails or instant messaging (44.7%). Finally, in relation

to technical mediation, this is least exercised in the monitoring of web pages (29.7%) and where most control is exercised is in antivirus (45.8%).

As a general remark, we can say that except for active mediation, less than half of the families exercise some type of parental mediation with their children with regard to Internet use via mobile devices.

Table 4

Response percentages in parental mediation types

Dimension	Items	Yes	No	Don't know
Co-use Would you say that one of your parents, sometimes …	Talks to you about what you do on Internet	48.4	41.8	9.9
	Sits with you while you use the Internet (watching what you do, but not actually participating)	29.3	54.2	16.5
	Is nearby when you are using Internet	46.9	35.5	17.6
	Encourages you to explore and learn things by yourself on Internet	44	43.6	12.5
	Shares activities with you on Internet	38.8	48.4	12.8
Active mediation in Internet safety Has either of your parents ever done any of the following things with you?	Help you when you have difficulty finding something on Internet	86.1	11.7	2.2
	Explain why some websites are good or bad	75.5	15.4	9.2
	Advise you on how to use Internet safely	78.4	16.1	5.5
	Suggesting ways of behaving towards other people online	59.7	25.6	14.7
	Help you when something on Internet has worried or upset you	62.3	21.6	16.1
	In general, talk to you about what to do if something on the Internet upsets or annoys you	60.1	27.8	12.1
Monitoring When you use Internet at home, do either of your parents ever check the following things?	The sites you have visited	30.4	48.4	21.2
	The messages in your e-mail or instant messaging account (Messenger, WhatsApp, Hangouts)	44.7	41.8	13.6
	Your profile on a social network (e.g., Instagram, Facebook, Snapchat, Twitter, etc.) or online community	37.7	45.1	17.2
	Which friends or contacts you add to your social networking profile (e.g., Instagram, Tik-Tok, Snapchat, Twitter, etc.) or messaging service (Messenger, WhatsApp, Hangouts)	44.3	35.9	19.8
	Parental controls or other software to block certain types of websites (software that does NOT allow	43.6	43.2	13.2

Dimension	Items	Yes	No	Don't know
Technical mediation Do your parents do any of the following things on the device you use most often at home?	you to visit certain websites or prevent certain types of Internet activities)?			
	Parental controls or other software to track the websites you visit (software that records the web pages you have visited so that you can later check what you have done on Internet)	29.7	52.4	17.9
	Having a service or contract that limits the amount of time you spend on Internet	31.1	54.9	19.9
	Programs to prevent undesired e-mails or viruses	45.8	36.6	17.6

When applying Spearman's Rho test, a positive and weak correlation is observed between co-use and active mediation, monitoring and problematic mobile use, as well as a moderate correlation with technical mediation. Active mediation correlates positively and weakly with monitoring and technical mediation. Monitoring correlates moderately with technical mediation (Table 5).

Table 5

Correlation between types of parental mediation and the scale of problematic smartphone use

Tests	Spearman's Rho	Co-use	Active mediation	Monitoring	Technical mediation	Problematic use
Co-use	ρ	1.000	.255**	.206**	.325**	.120*
	Sig. (bilateral)	.	<.001	<.001	<.001	.048
	N	273	273	273	273	273
Active mediation	ρ	.255**	1.000	.217**	.209**	.037
	Sig. (bilateral)	<.001	.	<.001	<.001	.543
	N	273	273	273	273	273
Monitoring	ρ	.206**	.217**	1.000	.416**	.064
	Sig. (bilateral)	<.001	<.001	.	<.001	.295
	N	273	273	273	273	273
Technical mediation	ρ	.325**	.209**	.416**	1.000	.113
	Sig. (bilateral)	<.001	<.001	<.001	.	.061
	N	273	273	273	273	273
	ρ	.120*	.037	.064	.113	1.000

Tests	Spearman's Rho	Co-use	Active mediation	Monitoring	Technical mediation	Problematic use
Problematic use	Sig. (bilateral)	.048	.543	.295	.061	.
	N	273	273	273	273	273

The correlation between problematic smartphone usage and the independent variables was also calculated (table 6), and the only two variables with which a correlation was found were owning a mobile phone and time spent using it daily.

Table 6

Correlation between the independent variables and the scale of problematic smartphone use

Tests	Spearman's Rho	Problematic use
Do you have your own smartphone?	ρ	-.262**
	Sig. (bilateral)	<.001
	N	273
Smartphone use time daily	ρ	.348**
	Sig. (bilateral)	<.001
	N	273

The non-parametric tests applied were U-Mann-Whitney and Kruskal-Wallis (for the contrast of means) according to each case.

Considering the independent variables examined in this study (sex, course year, father's and mother's educational level, own smartphone and daily usage time), we found significant differences compared to the types of parental mediation shown in table 7. Sex only influences active mediation (p=.011), school year in technical mediation (p=.028), own smartphone in co-use (p=.030) and father's studies in technical mediation (p=.028). In the case of the mother's studies, it is relevant that it influences all the dimensions of parental mediation, perhaps because it is the mother who at this age is more aware of her children's education, rather than the father.

The only independent variable that was not significant in any of the cases was the time spent using the mobile phone each day. Boys scored higher on average on active mediation ($\bar{x}$=8.71; dt=2.35) than girls ($\bar{x}$=8.01; dt=2.08), with a small effect size (Hedges' g=0.313). It therefore appears that parents are more likely to talk to boys than to girls about the content of the media they access. Primary 6 pupils scored a higher mean on technical mediation ($\bar{x}$=7.31; dt=1.61) than primary 5 pupils ($\bar{x}$=6.84; dt=1.83). The effect size is small in magnitude (Hedges' g=0.27). This means that the restriction of online content or time spent

on the Internet is exercised to a greater extent with older pupils, perhaps because families are more aware of the need to control these aspects at these ages than with younger pupils. Pupils who have their own mobile phone score a higher mean in co-use ($\bar{x}$=8.71; dt=1.6) than pupils who do not ($\bar{x}$=8.30; dt=2.02), where the effect size is small (Hedges' g=0.236). It seems that families understand that if their children already have a smartphone of their own, they should have more control, in a shared way, over the activities carried out with their children.

Table 7

Contrast tests of the types of parental mediation with the independent variables

Variables	Statistics	Co-use	Active mediation	Monitoring	Technical mediation
Sex	Mann-Whitney U		7597.000		
	Z		-2.550		
	Sig.		.011		
Course	Mann-Whitney U				7586.000
	Z				-2.198
	Sig.				.028
Own smartphone	Mann-Whitney U	5371.500			
	Z	-2.175			
	Sig.	.030			
Father's education level	Kruskal-Wallis H				14.178
	gl				6
	Sig.				.028
Mother's education level	Kruskal-Wallis H	16.769	13.941	14.943	20.782
	gl	6	6	6	6
	Sig.	.010	.030	.021	.002

For technical mediation and the father's level of education, the differences between the groups are shown in table 8. Students whose fathers had university studies obtained lower averages than those whose fathers had ESO, Baccalaureate, Intermediate Vocational Training (VT), Higher Vocational Training or did not know what studies they had. The effect size in all cases is small except in the ESO-University group, whose effect is large (Hedges' g=0.806). We can conclude that parents with a higher level of education exert less restriction on online content or time spent on the Internet than parents with a lower level of education.

Table 8

Effect size between groups. Variables: Father's studies and technical mediation

t-test for equality of means	Groups (Education level)	$\bar{x}$, dt	*Hedges' g*
.001	Don't know - University	7.30, 1.70 - 6.57, 1.48	0.46
.001	ESO - University	7.82, 1.85 - 6.57, 1.48	0.806
.026	Baccalaureate - University	7.35, 1.58 - 6.57, 1.48	0.521
.039	Intermediate VT- University	7.38, 1.89 - 6.57, 1.48	0.527
.028	Higher VT - University	7.29, 1.7 - 6.57, 1.48	0.467

For the mother's studies, this variable was significant with all types of parental mediation (Table 9). In reference to the type of co-use mediation, we observe that the groups where the differences were found were between pupils whose mothers have university studies and those whose mothers have a baccalaureate or whose study levels were unknown. In both cases, the effect size was moderate, the average being higher in the group of non-university students. Mothers with higher education engage in fewer shared activities with the media than mothers with less education.

In terms of active mediation and the mother's studies, differences were found between pupils whose mothers have university and baccalaureate studies and those pupils whose mothers' study levels were unknown. In the first case, the effect size is moderate tending to high and in the second case the effect is small. In both cases, the average for pupils with university-educated mothers was lower. Again, mothers with higher education explain and discuss the content of the media accessed by their children less than mothers with a lower educational level.

Differences were also found between pupils with mothers with ESO and baccalaureate studies, with a large effect size, and those with ESO and mothers whose study levels were unknown, with a small effect size. In this case, the mean of pupils with mothers who have an ESO level of studies is lower in both cases. We can see that on this occasion, mothers with a baccalaureate level carry out more active safety mediation than those with ESO studies.

In the case of monitoring and the mother's education, differences were found between mothers with ESO and baccalaureate education, the latter having a higher mean, with a moderate effect size tending towards high (*Hedges' g*=0.783). Between students whose mothers have studied ESO and those whose mothers' educational level was unknown (higher mean), with a moderate effect size. (*Hedges' g*=0.546). Between students whose mothers have a baccalaureate (higher mean) and higher vocational training, with a high effect size. (*Hedges' g*=0.919). Between baccalaureate (higher average) and university studies, with a small effect size (*Hedges' g*=0.431). Between intermediate VT (higher average) and tertiary VT, with moderate effect size (*Hedges' g*=0.66). Between VT at tertiary

level and those whose mother's study level was unknown (higher mean), with a moderate effect size (*Hedges' g*=0.670). And finally, between those with university-educated mothers and those who do not know what studies they have (higher mean), with a small effect size (*Hedges' g*=0.259). Therefore, we do not find a pattern that indicates a regularity in terms of the mother's higher or lower level of education being related to the control of children's Internet activities.

Finally, in technical mediation, there are differences between pupils whose mothers have university studies and those who do not know what studies their mothers have, whose average is higher. The effect size is moderate (*Hedges' g*=0.552). Between those with mothers with ESO (higher average) and university studies, with moderate effect size (*Hedges' g*=0.629). And among those whose mothers have baccalaureate /high school (higher average) and university studies, with moderate effect size (*Hedges' g*=0.684).

As with monitoring, in technical mediation, we cannot conclude that there is a pattern that indicates that the higher or lower the mother's level of education, the more the mother's restriction of online content consumption or the time spent online through the application of bans or technical filters.

Table 9

Effect size between groups. Variables: mother's education and types of parental mediation

Dimensions	t-test for equality of means	Groups (Education level)	$\bar{x}$, dt	*Hedges' g*
Co-us	.005	Baccalaureate - University	9.24, 1.52 - 8.16, 1.58	0.678
	.001	Don't know- University	9.02, 1.74 - 8.16, 1.58	0.513
Active mediation	.007	ESO - Baccalaureate	7.79, 1.93 - 9.7, 2.52	0.841
	.046	ESO - Don't know	7.79, 1.93 - 8.7, 2.19	0.421
	.002	Baccalaureate - University	9.7, 2.52 - 8.01, 2.06	0.791
	.011	Don't know- University	8.7, 2.19 - 8.01, 2.06	0.324
Monitoring	.011	ESO - Baccalaureate	6.53, 1.84 - 7.82, 1.33	0.783
	.015	ESO - Don't know	6.53, 1.84 - 7.46, 1.68	0.546
	.003	Baccalaureate - FP Superior	7.82, 1.33 - 6.32, 1.78	0.919
	.018	Baccalaureate - University	7.82, 1.33 - 6.98, 2.03	0.431
	.043	FP Medio - FP Superior	7.5, 1.65 - 6.32, 1.78	0.66
	.002	FP Superior - Don't know	6.32, 1.78 - 7.46, 1.68	0.670

Dimensions	t-test for equality of means	Groups (Education level)	$\bar{x}$, dt	*Hedges' g*
	.034	University - Don't know	6.98, 2.03 - 7.46, 1.68	0.259
Technical mediation	.001	University - Don't know	6.55, 1.54 - 7.43, 1.64	0.552
	.006	University - ESO	6.55, 1.54 - 7.58, 2	0.629
	.005	University - Baccalaureate	6.55, 1.54 - 7.59, 1.28	0.684

On the scale of problematic smartphone use, the variables that were significant are shown in table 10. This was not the case for the sex, year and father's level of studies variables. Therefore, having one's own mobile phone or using a mobile phone more per day are directly related to problematic smartphone use. As with the types of parental mediation, the mother's level of education also has an influence on problematic smartphone use.

Table 10

Tests of problematic smartphone use against the independent variables

Variables	Statistics	Problematic smartphone use
Own phone	Mann-Whitney U	4177.000
	Z	-4.326
	Sig.	<.001
Daily mobile phone use	Kruskal-Wallis H	33.448
	gl	3
	Sig.	<.001
Mother's education level	Kruskal-Wallis H	14.066
	gl	6
	Sig.	.029

To test for significant differences between groups on the scale of problematic smartphone use, the calculations shown in table 11 were carried out. Boys and girls who own their own mobile phones obtained a higher average for problematic smartphone use, with a moderate effect size (*Hedges' g*=0.623).

Taking into account the time of use per day, we can see that the longer the usage time, the higher the mean, with the effect size being moderate in all cases, except in the case of the two extremes of the time interval, which was very high. Therefore, we can affirm that daily usage time has a decisive influence on problematic smartphone use, as does owning one's own mobile phone, as both factors increase the likelihood of misuse and are the seeds of future problems.

Finally, considering the mother's education, the effect size was very high in the case of the extremes, i.e. between pupils with mothers who only have primary education and those with university-educated mothers, with the average risk being much higher among pupils in the former case. In the other two cases, the effect size was moderate.

On this occasion, it seems that the mother's level of education has a direct impact on children's possible problematic smartphone use in the sense that, as they have more education, they are able to have a more positive impact as a protective factor.

Table 11

Effect size between groups. Significant independent variables and problematic smartphone use

Variables	t-test for equality of means	Groups	$\bar{x}$, dt	Hedges' g
Own phone	.001	Yes - No	61.46, 17.43 – 50.73, 16.29	0.623
Daily mobile phone use	.005	0 to 30 min – 30 min to 1 hour	50.51, 15.78 – 57.35, 15.51	.435
	.001	0 a 30 min – 1 to 3 hours	50.51, 15.78 – 62.47, 17.26	.715
	.000	0 a 30 min – more than 3 hours	50.51, 15.78 – 69.94, 19.32	1
	.022	30 min a 1 hour - 1 to 3 hours	57.35, 15.51 - 62.47, 17.26	.309
	.001	30 min a 1 hour - more than 3 hours	57.35, 15.51 - 69.94, 19.32	.746
	.018	1 to 3 hours - more than 3 hours	62.47, 17.26 - 69.94, 19.32	.416
Mother's education level	.016	Primary - University	74.33, 22.05 – 54.04, 15.78	1
	.020	Baccalaureate - University	62.71, 16.37 - 54.04, 15.78	.543
	.000	University – Don't know	54.04, 15.78 – 62.21, 17.88	.494

Regarding the MLR of problematic smartphone use, the results of the model are shown in table 12. The method used was to introduce. The regression equation was statistically significant F=21.276, p=<.001. The value of R2=.136 indicates that 13.6% of problematic smartphone use can be explained by mobile phone ownership and time spent using a mobile on a daily basis.The regression equation was 53.619 - 5.633 (own phone) + 5.243 (smartphone use time). But as we can see, the proportion of the variable explained is very

low, so we will have to continue investigating which other variables may be predictors of problematic use.

Table 12

Multiple linear regression analysis

Predictor variables	F	R^2	B	SE	p
Model 1			53.619	4.99	
Do you have your own phone?	21.276	.136	-5.633	2.621	<.001
Daily smartphone use			5.243	1.108	

4. Discussion and Conclusions

Regarding the general objective set out in this research, it can be concluded that the type of parental mediation that pupils predominantly rely on is active safety mediation, whereby minors at home are normally assisted by a responsible adult, who offers the necessary explanations and advice to surf the Internet safely. These outcomes coincide with the results of Martínez *et al.* (2020) and Bartau-Rojas *et al.* (2020), where a preference was shown for enabling strategies and instructional style. This mediation is also highlighted by Yang *et al.* (2021) as the most helpful way to diminish problematic usage of the mobile device, while achieving a positive effect for the family relationship between parents and children. This mediation is an exception since, according to the results obtained, less than half of the parents engage in some kind of supervision with their offspring regarding Internet use from mobile phones. Here, we must bear in mind that according to Pérez-Sánchez and Brenes-Peralta (2022), family interventions are related to the types of use, with active mediation being the type that most favours appropriate use of the smartphone.

To conclude more precisely, we can point out that within parental mediation of co-use, the most recurrent action is that of talking about what is done on the Internet. As stated by Efrati *et al.* (2024) and Huang *et al.* (2024), we can point out that parental accompaniment and shared use, together with communication, help to moderate the unacceptable uses of smartphones that generate problems. In active mediation, the most common practice is offering to help with complicated web searches. In monitoring, what is most important for families is checking the messages received and sent by their children. And finally, in technical mediation, the concern for activating programs that help prevent spam and computer viruses is highlighted. The truth is that, in any type of mediation, family support is important and necessary, as it improves children's self-esteem and enriches the time spent on screens (Kim, 2022). In general terms, the results on problematic mobile phone use indicate that most students are not at high risk. However, these data may reflect that they are not yet very immersed in smartphone use and are therefore still distanced from its potential risks. These results are in line with those reported by Besolí *et al.* (2018), those who pointed out that the higher the grade and age, the more inappropriate uses and risks exist.

In this sense, children justify the problematic use of mobile phones through the community, highlighting that all their friends have their own devices. This statement is confirmed by the data collected in the study, as the majority of the third-grade primary pupils

surveyed, as also demonstrated by Solera-Gómez *et al.* (2022) - had their own mobile device on which they also tend to spend an average of 1 - 3 hours a day using Internet.

One of the most relevant findings of the study and, therefore, one of its main contributions, are the significant differences found between the independent variables (sex, year, father's and mother's level of education, own mobile phone and usage time daily) and the types of parental mediation. Gender influences only active mediation, the father's educational level and course of study have an impact on technical mediation, device ownership affects co-use and the mother's educational level impacts all types of parental mediation. Jiménez-Morales *et al.* (2020) pointed out that there are certain family profiles and characteristics that can act as protective or risk factors, with a high level of education being a favourable point, especially maternal education. Daily use each time is the only independent variable that did not significantly influence parental mediation.

The relationship of the variables mentioned with problematic smartphone use is also noteworthy: having one's own mobile phone, the daily usage time and the level of education of the mother are decisive (with a higher risk among pupils whose mothers have a primary school education and a lower risk among those whose mothers have attended university), leaving behind the influence of the father's education level, sex and school year. Thus, as observed by Sada Garibay *et al.* (2024), those caregivers who are most nourished with information are most likely to reduce misuse and encourage desired usage. In this way, we can affirm the importance of parental training in this new and necessary parental competence, which, as noted by Nagy *et al.* (2023), knowing how to mediate smart devices is already part of the complex set of contemporary parenting skills.

According to Gruchel *et al.* (2022), the motivational factor of adults in dealing with the issue is significant, and this has a positive influence on children who appreciate that their primary caregivers instruct them on practical and educational use of the technological elements that have Internet access. For this reason, and to conclude, we can point to the need to train families on the types of parental mediation in order to reduce and avoid the possible risks involved in the use of mobile devices in the hands of minors. Although awareness and involvement are gradually growing, as according to López-Ordosgoitia *et al.* (2025), adults must learn to regulate and accompany their interaction with small screens in order to promote the advantages and opportunities they offer.

Thus, for those parental profiles that have fewer competences and less information, and as a contribution, educational-communicative guides such as the one drawn up by Ramírez-García *et al.* (2022), in which caregivers can find guidance on this issue.

As the main limitation of the research, we point out the number of subjects in the sample, which only allows us to approach the specific context studied without being able to generalise these results to other contexts.

Finally, we highlight a clear future line and proposal for research: the reproduction of this work, but with the subjects involved in parental mediation, in order to delve more deeply into the supervisory actions and family perspectives, and, above all, to investigate even further the relationship between the socio-demographic variables of families and the problematic use of mobile phones by minors as an issue that concerns us so much and which we must alleviate.

Author contributions
Conceptualization, A.D.G.R., A.H.G. and C.P.M.; Data curation, A.D.G.R. and M.P.G.A.; Formal analysis, A.D.G.R. and M.P.G.A.; Funding acquisition, A.D.G.R. ; research, A.D.G.R. and A.H.G; methodology, A.D.G.R. and M.P.G.A.; project management, A.D.G.R. and M.P.G.A.; resources, A.D.G.R. and A.H.G.; software, A.D.G.R. and M.P.G.G.A.; supervision, A.D.G.R. and M.P.G.A.; validation, A.D.G.R. and M.P.G.A.; visualization, A.D.G.R. and A.H.G.; drafting-preparation of the original draft, A.D.G.R., M.P.G.A., A.H.G. and C.P.M.; drafting-revising and editing, A.D.G.R., M.P.G.A., A.H.G. and C.P.M.

Funding
R&D project "Instagrammers and YouTubers for the transmedia empowerment of Andalusian citizens. The media competence of Instatubers" (P18 -RT- 756). Funded by the Consejería de Transformación Económica, Industria, Conocimiento y Universidades (Junta de Andalucía).

Data Availability Statement
The data set used in this study is available upon reasonable request to the corresponding author

Ethics approval
Not aplicable

Consent for publication
All authors have consented to the publication of the results obtained by means of the corresponding consent forms.

Conflicts of interest
The authors declare that they have no conflict of interest

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How to cite:

García-Rojas, A.D., Gutiérrez-Arena, M.P., Hernando-Gómez, A. & Prieto-Medel, C. (2025). Tipos de mediación parental y uso problemático del móvil en escolares de tercer ciclo de Educación Primaria [Types of parental mediation and problematic mobile phone use in third grade Primary School pupils]. *Pixel-Bit. Revista de Medios y Educación*, 73, XX-XX. https://doi.org/10.12795/pixelbit.106808