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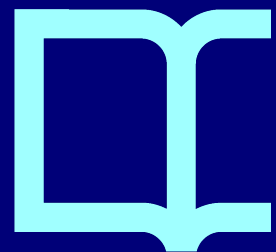
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## **Family context surrounding the use of technologies and their impact in adolescents' media multitasking**

Recent studies pointed out that practically all adolescents are regular users of ICT., Since the most usual context for the use of technology is the home, our aim is, on the one hand, to characterize the family technology context among adolescents aged between 11 and 18 years and, on the other hand, to analyse the relationship between multitasking and the different variables found within this family context. Participants were 977 adolescents. Significant relationship between the number of devices in the home and the frequency with which these are used are showed. Although a 60% of the adolescents have no parental rules over this use, there does not appear to be any relationship between the existence, or lack thereof, of rules over the use of ICT and multitasking. To reduce adolescents amount of media multitasking, we would recommend having fewer devices in the home rather than imposing rules about their use.

Keywords: Technologies; family; adolescent; multitasking; media; rules

## Family context surrounding the use of technologies and their impact in adolescents' media multitasking

### Introduction

According to data from Eurostat (2017), children, adolescents and young people are the biggest users of information and communications technology (ICT). Specifically, the most recent data available indicates that in Spain 93% of adolescents between 10 and 15 years old use the Internet (INE, 2019) and only 0.3% of young people between 14 and 24 years old do not have any device for their individual use (computer, smartphone, tablet or other) (Megías & Rodríguez, 2018). This data is very similar to that provided by Pew Internet, which shows that 95% of young people in the US have access to a smartphone (Pew Research Internet Center, 2018). We can therefore unequivocally affirm that young people lead the way when it comes to purchasing and using ICT.

When asked what activities they carry out most often, the first activity mentioned by young people in Spain is searching for information and visiting websites, both for their studies and work (90%) and just for fun and enjoyment (86%). Another frequent activity is contact with others (75%), followed by online gaming (70%) (Megías & Rodríguez, 2018). This data is not dissimilar to that found in international studies (Lau & Yuen, 2016); and, although the ages of the samples vary in the different studies, they all paint a fairly similar picture regarding young people's use of technology.

One of the aspects that has emerged in the data provided by these studies is that of so-called media multitasking, which has become a prevalent behavioural trend among the younger generations (Srivastava et al., 2016). This phenomenon refers to both the use of multiple media/devices in the same period of time and the use of some form of media/device while

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2  
3 carrying out a different activity, such as homework (van der Schuur et al., 2015). Hence, it is  
4 common for young people to perform other activities while watching the television (Cain et  
5 al., 2016), listening to music (Voorveld & van der Goot, 2013) and sending messages on their  
6 phones (Baumgartner et al., 2014).  
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12 Given the presence of media multitasking among young people, different studies have  
13 analysed whether this activity may affect other aspects of their lives and, if so, how. Although  
14 there is no consensus in this respect at present, more recent investigations point to a relationship  
15 between multitasking and the ability of young people to regulate their attention processes, so that  
16 as their multitasking increases it becomes more difficult for them to suppress irrelevant  
17 information, resulting in a higher level of distractibility. Likewise, multitasking could also be  
18 linked to lower academic achievement and a reduced ability to regulate emotions (Cain et al.,  
19 2016; May & Elder, 2018; Murphy et al, 2017; van der Schuur et al., 2015).  
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31 Together with the frequency of multitasking, and perhaps related to it, the studies  
32 highlight that adolescents perceive themselves as highly skilled users of ICT. In this respect,  
33 Clark (2009) and Shifflet-Chila et al. (2016) describe how adolescents feel they have mastered  
34 ICTs, both technically, content-wise and risk-wise. However, beyond this self-perception,  
35 some authors have pointed out that adolescents tend to focus more on the positive aspects of  
36 ICT (especially for their communicative value), without being overly concerned about the  
37 risks it may involve (Rosen et al., 2008).  
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47 Since adolescents use ICT most frequently in the home (Eurostat, 2017), it is reasonable  
48 to surmise that the family context has a part to play in determining the opportunities for use and  
49 the risks involved (Len-Ríos et al., 2015; Mascheroni, 2014; Paus-Hasebrink et al., 2013;  
50 Rodríguez de Dios et al., 2018; Smahel et al., 2020; Sonck et al., 2013; Valcke et al., 2010).  
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56 If we analyse this family context in greater depth, it seems clear that parents use ICT  
57 less intensively than adolescents and young people (see, for example, Fletcher & Blair, 2016).  
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3 Besides frequency of use, Özgür (2016) and Shin (2015) note that parents are less digitally  
4 skilled, whether because they do not need ICT, they do not know how to use it or they are  
5 unsure of how to get up to date in this area. Different authors have also observed that parents  
6 are perceived by their children as unskilled or as students that need to be taught certain digital  
7 skills (Fletcher et al., 2016; Nelissen et al., 2018; Shifflet-Chila et al., 2016; Sureda-Negre et  
8 al., 2010;).

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10 Lau et al. (2016) and Mascheroni (2014) establish certain differences between both  
11 parents, describing fathers as having medium-high skills in the use of ICT. Developing this  
12 aspect, other authors (Mostmans, 2016; Paus-Hasebrink, 2013; Sonck et al., 2013) also  
13 present fathers who are very confident at using the Internet and ICT. In these same studies,  
14 mothers are usually characterized as being reasonably digitally skilled (less than fathers) and  
15 as feeling more inadequate in the use of ICT.  
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18 One of the most important aspects to consider regarding the family context and its  
19 possible influence on adolescents' use of ICT is the existence or lack thereof of rules over this  
20 use. In this respect, analysing the relationship between parents and children and whether the  
21 former imposed rules for the use of ICT, Jake-Schoffman et al. (2017) found that 51.17% of  
22 adolescents stated that they got on well with their parents; 30.29% of adolescents indicated that  
23 their parents' rules over the use of ICT were implemented most of the time; 17.54% stated that  
24 they did not have any rules; while 7.40% affirmed that the parental rules established were never  
25 implemented. In the same vein, other studies describe the low perception that adolescents have  
26 regarding the existence of rules over the use of ICT and social media in the home, also indicating  
27 how the absence of these rules represents a risk factor in the excessive use of technology among  
28 adolescents (Malo et al., 2018; Martín-Perpiñá et al., 2019).  
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31 Valcke et al. (2010) analysed parenting styles and the impact they have on children's  
32 use of the Internet. According to the data collected, these parenting styles are related to the  
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3 parents' own use of the Internet, their attitudes towards the Internet and their experience with  
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5 ICT. Parents who are the least skilled in the use of ICT exert the least control and set fewer  
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7 rules over their children's use of it; at the same time, the children of parents who adopt a more  
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9 permissive style make greater use of ICT. The study by Fletcher and Blair (2016) also  
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11 demonstrated that adolescents understood and accepted the rules better when parents were  
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13 experienced with ICT; on the other hand, when the adolescents were more experienced than  
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15 their parents, there tended to be no parental rules over the use of ICT, or the adolescents did  
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17 not properly understand them.  
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22 Other authors, such as Kumar (2016), Mostmans (2016), Shifflet-Chila et al. (2016)  
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24 and Sonck et al. (2013), assert that adolescents tend to understand and accept the reasons that  
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26 their parents set or negotiate certain rules regarding the use of ICT. That said, adolescents  
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28 consider it more important for their parents to trust them than for them to guide or monitor  
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30 them in their use of ICT. Furthermore, given their level of expertise, they feel capable of  
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32 using ICT safely with few or no rules, although these rules may be useful for younger  
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34 children (Shifflet-Chila et al., 2016). In fact, according to the studies of Özgür (2016), and  
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36 Sánchez-Valle et al. (2017), parents tend to implement more rules over the use of ICT when  
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38 their children are younger, and parental rules diminish as children get older.  
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43 Regarding the way in which family context (i.e. the availability and use of ICT in the  
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45 home and the existence or lack thereof of rules over use) can be related to a greater or lesser  
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47 degree of media multitasking among adolescents and young people, we have not found any  
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49 study that explicitly explores both elements. However, the work of Domoff et al. (2019)  
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51 points to the existence of a parallel family use of different media. Thus, for example, it would  
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53 not be unusual for different family members to be using their mobile phones within the same  
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55 physical space while simultaneously sharing another form of media (TV, radio, etc.).  
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3           Within this research context, the general aim of the study is to discover the  
4 relationship between adolescents' use of ICT and the family context. More specifically, the  
5 research aims are as follows:  
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10           (1) Describe the use of technological devices by adolescents and the people living in the  
11 family context.  
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13           (2) Analyse the rules over use of technology in the home and verify whether they are  
14 related to other variables regarding the use of ICT in the family context.  
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16           (3) Explore the relationship between the profiles of heavy/non-heavy media multitaskers  
17 and the availability of technological devices and rules over use within the family  
18 context.  
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## 28 **Method**

### 29 **Participants**

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32           The study was based on a sample of students between the ages of 11 and 18 years from  
33 secondary schools, upper secondary schools and vocational training centres in L'Alt Empordà  
34 (Girona, Spain). A multistage cluster sampling technique was used to select a random sample  
35 (n=1218), from which any respondents who had not answered both parts of the questionnaire  
36 or who had answered erroneously were then disregarded. The final sample comprised 977  
37 adolescents with an average age of 14.37 years (SD=1.769), 51.9% of whom were female. Of  
38 the six educational establishments that participated in the study, 84.4% were public and  
39 72.4% of the participating students were enrolled in Compulsory Secondary Education.  
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### 54 **Instruments**

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56           A protocol was established using standardized scales and items constructed ad hoc.  
57 Sociodemographic information about the sample was also collected. The following scales are  
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3 explored in the study:  
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6 Frequency of use of audiovisual media (created ad hoc). Scale to measure the  
7 frequency of use of the mobile phone, tablet, computer, video games (PlayStation,  
8 Xbox, Wii, etc.) and television. The answers are evaluated based on five categories  
9 (1=Never; 2=Little; 3=Often; 4=Very often; 5=Continuously).  
10

11 Availability of technological devices in the home (created ad hoc). Using the same list  
12 of audiovisual media as in the previous question, the subjects were asked to indicate  
13 how many technological devices they have at home from the following options: one;  
14 two to three; four to five; six; or seven or more.  
15

16 Self-attributed scale of technology use (mobile, tablet, computer, video games,  
17 Internet) (Casas et al., 2007). A single-item scale asking the subjects what kind of  
18 social media consumer they consider themselves to be based on five possible answers  
19 (1=I never or hardly ever use them; 2=I'm a low consumer; 3=I'm an average  
20 consumer; 4=I'm a fairly high consumer; 5=I'm a very high consumer).  
21

22 ICT use typology (mobile, tablet, computer, video games, Internet) self-attributed to  
23 the family members. Single-item scale adapted from that of Casas et al. (2007), where  
24 the adolescents were asked to indicate their perception of their parents' (mother and  
25 father) and siblings' use, based on five response categories (1=Never or almost never  
26 uses them; 2=Slight user; 3=Medium user; 4=Moderately high user; 5=High user). For  
27 siblings, a variable was calculated that enabled us to cluster the average attributed.  
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29 Rules over the use of ICT in the home (version adapted from Hiniker et al., 2016). A  
30 dichotomous question (Yes/No) was created to explore whether there are any rules set  
31 at home for the use of ICT (mobile, computer, tablet, etc.). The respondents were also  
32 asked to indicate who decided these rules, with five possible answers (father, mother,  
33 father and mother together, your caregiver or between everyone); whether the parents  
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3 or caregivers followed these rules (Yes/No); and whether they considered it important  
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5 for their parents or caregivers to follow these rules themselves (Yes/No).  
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8 Use of media and multitasking. To assess multitasking, an adapted version of the index of  
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10 Ophir et al. (2009) was calculated, which is similar to that used by Baumgartner et al.  
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12 (2014). Following the criteria of these authors, nine matrices were constructed, each of  
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14 which corresponds to the main use of a particular media type and the frequency with  
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16 which the rest of the media types are used. The matrices correspond to watching  
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18 television, listening to music, reading, speaking on the telephone, sending messages on  
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20 the mobile (SMS, WhatsApp, Snapchat, etc.), computer or tablet, using social media  
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22 (Facebook, Twitter, etc.), watching films or series online, other activities using the  
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24 computer, mobile or tablet (e.g. browsing the Internet) and playing video games. The  
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26 frequencies indicated range from never (1) to very often (4). The values for each media  
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28 type or main activity have been added up to obtain the average use for the other media  
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30 types in relation to the main one or when the students are doing their schoolwork. The  
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32 overall average (MMI) was then calculated by dividing the sum of all the matrices by the  
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34 number of matrices, that is, by nine. The same procedure was followed for schoolwork  
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36 (MMHW), based on a single matrix. Internal consistency (Cronbach's alpha) for the  
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38 overall index of MMI is 0.96 and 0.81 for that of MMHW.  
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#### 45 **Procedure**

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47 To commence the study, permission was obtained from the Government of Catalonia's,  
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49 Department of Education as well as from the management teams of the educational  
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51 establishments taking part. The research aims were explained and the participants were assured  
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53 that they would remain anonymous and that their data would be treated confidentially. The  
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55 questionnaire was administered during school hours in the adolescents' usual classrooms, with  
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3 the presence of one or two researchers to provide any clarifications required. Given the length  
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5 of the questionnaire, it was administered over two separate sessions to avoid subject fatigue.  
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### 8 9 **Data analysis**

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11 Descriptive analyses were carried out to analyse the availability and frequency of use of  
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13 technological devices in the home, the perception of the family's use of technology and the rules  
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15 over ICT use. To create the group of heavy and non-heavy media multitaskers, first the general  
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17 media multitasking index was calculated and then the users were classified based on the  
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19 distribution of quartiles, considering those under 25% to be within the non-heavy media  
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21 multitasking group and those above this quartile in the heavy media multitasking group. *T*- and  
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23  $\chi^2$ -tests were applied to examine the relationship between these groups and the family context  
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25 of ICT use.  
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29 All the analyses were conducted using SPSS Statistics, version 25.0. The minimum level of  
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31 statistical significance required in all the tests was  $p < .05$ .  
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### 37 **Results**

#### 38 39 **Availability, frequency of use and perception of use of ICT in the family context**

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42 As we can see in Table 1, which provides an analysis of the number of devices that students  
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44 have in their homes, in terms of mobile phones, only 1.8% reported that there is one mobile  
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46 phone in their home, whereas most of the students (46.9%) reported that there are four to five  
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48 mobile phones. In terms of tablets and video game consoles, most of the students reported that  
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50 they have one (53.9% and 49.4%, respectively). Regarding computers and TVs, most of the  
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52 students reported that they have two to three devices (55.5% and 54.8%, respectively).  
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Table 1. How many devices do you have at home?

	1	2-3	4-5	6	> 7
Mobile Phone	18 (1.8%)	344 (35.4%)	456 (46.9%)	89 (9.1%)	66 (6.8%)
Tablet	462 (53.9%)	329 (38.4%)	47 (5.5%)	12 (1.4%)	7 (0.8%)
Computer	259 (27.3%)	527 (55.5%)	123 (13%)	26 (2.7%)	14 (1.5%)
Video Game Console	432 (49.4%)	303 (34.7%)	75 (8.6%)	23 (2.6%)	41 (4.7%)
TV	143 (14.8%)	530 (54.8%)	215 (22.2%)	49 (5.1%)	30 (3.1%)

In terms of the types of devices used by students, 38.3% reported using a mobile phone continuously—the most used device—whereas 38.9% said that they never use a tablet—the least used device (Table 2).

Table 2. Descriptive statistics of the use of new technologies

	Descriptive statistics of the use of new technologies				
	Never	A few times	Sometimes	Often	Continuously
Mobile Phone	38 (3.4%)	64 (5.8%)	159 (14.4%)	306 (27.8%)	422 (38.3%)
Tablet	429 (38.9%)	274 (24.9%)	147 (13.3%)	90 (8.2%)	43 (3.9%)
Computer	62 (5.6%)	291 (26.4%)	289 (26.2%)	210 (19.1%)	131 (11.9%)
Video Game Console	376 (34.1%)	273 (24.8%)	134 (12.2%)	106 (9.6%)	100 (9.1%)
TV	72 (6.5%)	204 (18.5%)	221 (20.1%)	255 (23.1%)	240 (21.8%)

The availability of devices in the home correlates positively and significantly with the frequency with which they are used (Table 3). A greater number of mobile phones in the home relates to a greater use of these by the adolescents as well as of tablets. Furthermore, the greater the number of tablets in the home, the greater the use of video games and television. In the case of television, the greater the availability, the greater the frequency with which all the devices, except computers, are used.

Table 3. Correlation between frequency of use and ownership of ICT at home

Frequency of use	Number of devices at home				
	Mobile Phone	Tablet	Computer	Video Game Console	TV
Mobile Phone	.223**	n.s.	.069*	n.s.	.151**
Tablet	.099**	.291**	.147**	.123**	.070*
Computer	n.s.	n.s.	.227**	n.s.	n.s.
Video Game Console	n.s.	.107**	.130**	.318**	.166**
TV	n.s.	.081*	n.s.	n.s.	.086**

\* Significance level  $p < .05$ ; \*\* Significance level  $p < .01$

The analysis of the adolescents' perceptions of family members' consumption of technologies (Table 4) showed that their fathers are categorized as low (35.5%) or average consumers (34.6%), and their mothers as medium consumers (39%). Only a small percentage reported that their parents are very high consumers (3.2%–3.9%). In terms of the technology consumption of brothers/sisters, the students perceive that their first brother/sister tends to be a fairly high or very high consumer (35.6% and 22.8%, respectively). Regarding the other brothers/sisters, the distribution is more equitable across the categories of consumption. Their

own perception of consumption is very similar to that of the first brother/sister, with most of them categorizing themselves as fairly high consumers.

Table 4. Own perception and family members' perception of technology consumption

	Never or hardly ever use	Low consumer	Average consumer	Fairly high consumer	Very high consumer
Adolescents (own perception)	7(0.7%)	47(4.9%)	281(29.4%)	457(47.9%)	163(17.1%)
Father	129(13.6%)	337(35.5%)	328(34.6%)	118(12.4%)	37(3.9%)
Mother	76(7.8%)	283(29%)	381(39%)	196(20.1%)	41(3.2%)
Brother/sister 1	70(8.2%)	77(9%)	207(24.3%)	303(35.6%)	194(22.8%)
Brother/sister 2	54(14.4%)	59(15.7%)	97(25.8%)	103(27.4%)	63(16.8%)
Brother/sister 3	34(20.7%)	27(16.5%)	37(22.6%)	38(23.2%)	28(17.1%)
Brother/sister 4	20(20.6%)	16(16.5%)	22(22.7%)	15(15.5%)	24(24.7%)

### Rules over use of ICT and availability and use of ICT in the family context

Regarding the establishment of rules at home when using technologies (Table 5), almost 60% of the students suggested that they do not have any rules over use. Of those who have established rules, around 59% reported that the rules are decided by their father and mother together and more than 60% consider that their parents also follow these rules (61%) and that it is important for their parents to follow the same rules (64.1%).

An analysis of the number of devices that participants have at home (Table 3 above) and their frequency of use (Table 4 above) compared with the establishment of rules showed that students who do not have rules at home tend to have more mobile phones ( $\chi^2(4)=10.332$ ;  $p=0.035$ ) and use this device more ( $\chi^2(4)=12.201$ ;  $p=0.016$ ), as well as television ( $\chi^2(4)=50.24$ ;  $p<0.005$ ), when compared with their peers who have well established rules.

Table 5. Rules at home regarding the use of new technologies

		Frequency (%)
When using the technologies (mobile, tablet, computer, video games, etc.) at home do you have some "rules of use" established?	Yes	391 (40.1%)
	No	583 (59.9%)
Who decides these "rules" for the use of technologies?	Father	25 (6.5%)
	Mother	81 (21%)
	Father and Mother	227 (58.8%)
	Caregiver	3 (0.8%)
	All together	50 (13%)
Do you consider that your parents and/or caregivers also follow these rules of use of technologies	Yes	239 (61%)
	No	153 (39%)
Do you consider it important for your parents to follow the same rules as you?	Yes	252 (64.3%)
	No	140 (35.7%)

### **Assessment made by heavy and non-heavy media multitaskers of the use of ICT in the family context**

Descriptive statistics for non-heavy and heavy groups in assessing their relatives' technology consumption are shown in Table 6. Students with a higher media-multitasking score on average perceived that their relatives also make greater use of devices, compared to the perception that light multitaskers have. The only exception is when referring to the use made by the fourth brother/sister. If we compare these patterns between non-heavy and heavy media multitaskers with the data shown in Table 4, the results suggest that students from the heavy group reported a significantly higher perception of their family members' use of technology.

Table 6. Perception of father, mother and siblings' technology consumption by media multitasker profile (Heavy vs. Non-heavy)

	Non-Heavy (n=278)		Heavy (n=275)		t	p
	Mean	SD	Mean	SD		
Father	2.37	.991	2.77	1.030	-4.542	< 0.001
Mother	2.70	.981	3.14	.925	-5.268	< 0.001
Brother/sister 1	3.28	1.203	3.83	1.156	-5.099	< 0.001
Brother/sister 2	2.74	1.373	3.48	1.214	-4.100	< 0.001
Brother/sister 3	2.51	1.304	3.19	1.345	-2.413	< 0.001
Brother/sister 4*	2.30	1.428	3.30	1.418	-2.677	0.010

Note. This analysis was performed with only 23 answers from the non-heavy group and 40 from the heavy group

When considering the number of technological devices in the home (between 1 and 7 or more), the results show that the adolescents in the heavy multitaskers group claim to have a significantly higher number of mobile phones ( $\chi^2(4)2=32.555$ ;  $p<.0001$ ), tablets ( $\chi^2(4)2=17.614$ ;  $p=.001$ ), video games ( $\chi^2(4)2=18.549$ ;  $p=.001$ ) and televisions ( $\chi^2(4)2=26.938$ ;  $p<.0001$ ) in the home, compared with the group of non-heavy multitaskers. No statistically significant differences were observed regarding the number of computers available. Concerning the rules over the use of ICT, no statistically significant differences were observed between either of the groups.

Our findings show that adolescents aged 11 to 18 years have a high perception of living in a family context that is overflowing with technology. Half of homes have between 4 and 5 mobile phones and between 2 and 3 computers and televisions, which are the devices most frequently used by adolescents.

## Discussion

Our initial data enables us to corroborate the data collected systematically by various official statistical sources (Eurostat, 2017; INE, 2019; Ofcom, 2019). It is interesting to observe how this family context, where electronic devices abound, encourages a greater use of them by adolescents, and homes with the greatest number of televisions report a more frequent use of other technologies.

Another interesting trend that we observed in our study is how adolescents' perception of consumption varies for each family member. As indicated in previous studies, parents are usually perceived as low or medium consumers and fathers consume less than mothers (Fletcher & Blair, 2016). Adolescents perceive themselves as very heavy consumers, and have the same perception of their siblings, especially of older ones (Clark, 2009; Shifflet-Chila et al., 2016). In this respect, some studies have highlighted the mediating role of older siblings in their younger siblings' consumption of ICT (Siivak & Nevski, 2020) and other studies have even shown that the consumption of siblings can be a risk factor in the excessive use of technology (Martín-Perpiñá et al., 2019).

Adolescents' interaction with ICT in the family context is mediated through different regulation strategies implemented by their parents. One of these is the use of rules in the home, understood as more of a restrictive type of regulation (Livingstone & Helsper, 2008). In this respect, the second aim of our study has shown that over half our sample does not have any rules over ICT use, an aspect that is related to having a greater number of devices in the home in general and, specifically, to having more smartphones while also using them and the television more frequently. Conversely, the implementation of rules over the use of technology in the family context is associated with fewer devices in the home. We may therefore deduce that a level of consciousness or awareness of the issue can be a protective factor, both for the purchase and the use of technology. As previous research shows, the absence of any rules at



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3 home could be a risk factor that encourages a more intensive use of some devices, especially  
4 mobile phones, and it could also be related to developing a more problematic use of  
5 technology (Malo et al., 2018; Martín-Perpiñá et al., 2019). In this sense, our results provide  
6 further evidence of the important role that family members have as regulators of their  
7 children's use of ICT (Kumar, 2016; Mostmans, 2016; Smahel et al., 2020) and how parents'  
8 use of ICT can impact on their children's own use (Valcke et al., 2010). Our results also lead  
9 us to think of the importance of using diverse family regulation strategies, and not only the  
10 more restrictive (normative) ones, given that the literature shows how active media education  
11 is more effective as it enables a context of trust and dialogue and offers a model for  
12 responsible use of technology (Shifflet-Chila et al., 2016; Sonck et al., 2013).

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14 We have also seen that the family's media context and media ownership are related to  
15 adolescents' multitasking behaviour. Kononova and Chiang (2015) also found that media  
16 ownership significantly predicted media multitasking behaviour: the more media devices  
17 participants possessed, the more places these devices were available (e.g. home, car); and the  
18 greater the access to the Internet and social media sites, the more participants engaged in  
19 media multitasking behaviour.

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21 The question of our research concerns the relationship between the family's ICT  
22 consumption profile and the adolescents' media multitasking. There is little evidence  
23 regarding this issue, but some studies have pointed out that, in general, a family overloaded  
24 with technology and parents who have a positive view of technology are two factors that  
25 could enhance the availability of technology together with their children's use and multi-use  
26 of it (Dikcius et al., 2017). In this sense, our results indicate that adolescents with a heavy  
27 media multitasker profile perceive their relatives, particularly the mother and the first  
28 brother/sister, as more intense consumers of ICT. As previous studies demonstrate,  
29 multitasking is related to a greater availability of different devices (Ettinger & Cohen, 2020).

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3 In this sense, our data demonstrates that heavy multitaskers report that their families  
4 have more devices at home, but no differences are observed in these two groups regarding the  
5 implementation of rules over the use of ICT at home. This unexpected result offers us a novel  
6 finding: contrary to our expectations, media multitasking is not related to the existence of  
7 rules in the home. Rather, it is related to the number of devices in the home and the use made  
8 of these. Therefore, if our intention is for adolescents to reduce their amount of media  
9 multitasking, we would recommend having fewer devices in the home rather than imposing  
10 restrictive rules about their use.  
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## 25 **Conclusions**

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28 The characteristics described by the adolescents in this study regarding the technological  
29 profile of their families relate to (a) homes heavily equipped with technology; (b) a self-  
30 perception of high ICT consumption, with the same perception for their siblings' consumption  
31 and, to a lesser extent, their parents' consumption; (c) a positive correlation between the  
32 availability and use of technology; (d) homes with fewer restrictions over the use of ICT and,  
33 therefore, greater access to and use of technology; and (d) a heavy media multitasking profile  
34 related to a greater perception of the family's technological consumption.  
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## 48 **Limitations and future research**

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50 This study has some potential limitations, one of which is the age of the sample. The scientific  
51 literature on the subject, and much of the literature cited in this work, deals with samples of  
52 adolescents of widely varying ages, ranging from broad age ranges, such as in our sample, to age  
53 ranges of between 9 and 11 years old. It is therefore difficult to compare the different children and  
54 adolescents used in each study to form conclusions. Also, our findings cannot be  
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3 generalized to other cultures or to other stages of education, such as university students.  
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6 However, we do want to emphasize the fact that our data does not come from artificial  
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8 laboratory tasks, and our research does not focus on university students or adults, but on the  
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10 information provided to us by adolescents rather than by their parents or teachers.  
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13 Furthermore, the descriptive data of the use of ICT comes from the perception that  
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15 adolescents have of their use of it. In future work, and given the development of smartphone  
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17 software, we could obtain objective data on ICT use, both on social networks and the Internet.  
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19 This data would enable us to draw conclusions that reflect more closely the actual use of ICT,  
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21 and even compare that actual use with adolescents' self-perception of their use.  
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24 Lastly, although the size of our sample is one of the strengths of the work, it is tempting to  
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26 compare studies that bring together the same type of variables regarding the use of ICT,  
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28 adolescents and the family context. However, few cross-country studies have been carried out,  
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30 and we suspect that demographic and culture differences play a key role in this kind of issue,  
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32 making it difficult to compare the data on adolescents from different countries and cultures.  
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### 35 36 37 38 **Disclosure statement**

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41 The authors declare that the research was conducted in the absence of any commercial or  
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43 financial relationships that could be construed as a potential conflict of interest.  
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