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Leisure, interpersonal relationships, learning and consumption: the four key dimensions for the study of minors and screens

Ocio y tiempo libre, relaciones interpersonales, el aprendizaje y el consumo: las cuatro dimensiones clave para el estudio de los menores y las pantallas

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ABSTRACT: This study focuses on the needs Spanish minors wish to satisfy in their use of three types of screens (computers/the Internet, cell phones and video games) which can be included in the dimensions of relationships, leisure, learning and consumption. Using a representative sample of the school population in Spain aged between 10 and 18, collected in 2009, principal component analysis is applied to better understand the use of screens and see how these dimensions often interact. This analysis takes into account the gender and age variables of the respondents.

Keywords: Children, teenagers, Internet, video games, cell phone, dimensions of use, principal component analysis.

RESUMEN: El presente estudio se centra en las necesidades que los menores españoles satisfacen cuando utilizan tres pantallas concretas (ordenadores/internet, teléfono móvil y videojuegos), necesidades que pueden englobarse en las dimensiones de relación, ocio, aprendizaje y consumo. Usando una muestra representativa de la población escolarizada en España, de 10 a 18 años, y recogida dUrante 2009, se aplica análisis de componentes principales para comprender mejor el uso de estas pantallas y la manera en que a menudo están interrelacionadas sus dimensiones de uso. El análisis tiene en cuenta las diferencias marcadas por la edad y el sexo de los encuestados.

Palabras clave: niños, adolescentes, Internet, videojuegos, teléfono móvil, dimensiones de uso, análisis de componentes principales.

1. Introduction

The relationship between children and technology is an issue that has always attracted the interest of researchers. If we go back to the 1930's, we find the first studies on children and radio together with some on children and the movies (Payne Fund Studies). Throughout the twentieth century, that interest broadened as new technology appeared: in the 50's with the arrival of television, in the 80's with the popularity of video games, and between the mid-90's and the beginning of this century, with the rapid growth of Internet and cell telephony.

The newer screens (video games, the Internet and cell phones) are particularly relevant because they offer new user possibilities: contact with people from different geographical locations, the ability to create content (blogs, websites, etc.), educational use in the classroom or at home (educational software, *online* information, etc.) and so on. Several risks and opportunities for the child accompany these new uses, and these risks are an issue of interest for multiple agents. This interest is mainly based on the increased vulnerability of the children to technological risks when compared with adults. They are developing human beings, who often lack the necessary criteria or knowledge to fully understand the situation they are exposed to. In addition, the issue becomes more complicated by the fact that very often parents are not as advanced as their children in the management of new technologies, which makes their job as mediators more difficult. Tapscott called these differences "a generation gap", meaning that many parents "unfortunately are being left behind"; some children reach and surpass adults in the technological track, over passing them in many areas of everyday life[1].

The situation described has given rise to a lot of research, carried out mainly with a protective intention that focuses on studying the use children make of new technologies. Very relevant in the United States are the investigations of the Kaiser Family Foundation and the Pew Research Center, organizations that do regular representative surveys of minors. Outstanding in Europe is the EU Kids *Online* project, promoted by the European Commission to find out how minors use the Internet in the States member of the European Union, and focuses particularly on the *online* risks that this segment of the population face. We must also highlight the work of the Interactive Generations Forum, an organization that has collected representative data on the use of screens

[1] Cfr. TAPSCOTT, D., *Creciendo en un entorno digital: la Generación Net*. Santafé de Bogotá, McGraw-Hill Interamericana, Santafé de Bogotá, 1998, p. 30.

among the school population (from 6 to 18) in nine Latin American countries and Spain.

The worldwide research leads us to conclude that, today, children and teenagers are an important public consumer of screens. In the U.S., for example, we find a very high level of technological equipment in households with children between 8 and 18: 99% have TV, 94% have a radio, 93% have a computer, (84% of which are connected to Internet), 87% own video games, and finally 66% have a cell phone[2].

In Europe, we can also find high levels of screen use by minors: 3 out of 4 young people from 27 EU member States, aged between 6 and 17, were surfing the Internet in 2008, according to their parents[3], while the index of ownership of a cell phone is 63%, according to the study[4]. In addition, nearly 3 out of 4 young people (74%), aged between 6 and 16, from 12 different countries, claimed to use electronic games in 2001[5].

Regarding the possibilities offered by all these technologies, the Internet is possibly the one that offers the broadest range. The following table shows the main *online* activities carried out by minors globally, which are grouped into four broad categories:

[2] Cfr. RIDEOUT, V., FOEHR. U. G., and ROBERTS, D. F., *Generation M2: Media in the Lives of 8-18 Year-olds*, The Henry J. Kaiser Family Foundation, Menlo Park, CA, 2010, p. 9.
[3] Cfr. EUROBAROMETER, *Flash Eurobarometer 248: Towards a safer use of the Internet for children in the EU –a parents' perspective*. Analytical report. The Gallup Organisation, under request of the Directorate General Information Society and Media, Hungary, 2008, p. 11.
[4] Cfr. EUROBAROMETER, 2008, *op. cit.*, p. 20.
[5] Cfr. LIVINGSTONE, S. and BOVILL, M. (eds.), *Children and their changing media environment: a European comparative study*, Lawrence Erlbaum Associates, Mahwah, NJ, 2001, p. 92. It was not possible to find more recent multinational data regarding the use of videogames in Europe.

Table 1. The most popular *online* activities among children in the world, by region

	U.S.	Europe	Spain	Latin America
Communication/ relationship	E-mail (73%), instant messaging (68%), social networks (65%)	Instant messaging (61%), social networks (60%), e-mail (59%), comments or posts (31%), webcam (29%), chatroom (22%)	Messenger (77%), e-mail (65%)	Social networks (75%), e-mail (62%), messenger (41%), SMS (29%), phone calls (26%), chat (12%)
To know / surf the Web (content of their interest)	Checking out news (63%), read blogging (49%)	Doing homework (84%), news (48%)	Surfing the web (76%), downloading music, videos, programs, etc. (69%)	Surf the web (67%), downloading pictures/ videos (55%), use of software (40%)
Fun/ entertainment	*Online* games (78%) download music (58%), watch videos *online* (57%)	Watching videos (83%), only *online* games (74%), *online* games against others (44%), downloads (42%)	*Online* games (61%)	*Online* Games (63%), digital TV (10%), digital radio (8%)
Consumption	Buying *online* (38%)		Buying or selling *online* (8%)	Buying *online* (6%)

Source: from the authors, based on JONES, S. and FOX, S., *Generations Online 2009*, Pew Internet & American Life Project, Washington D.C. 2009, p. 5; LIVINGSTONE, S., HADDON, L., GÖRZIG, A. and ÓLAFSSON, K., *Risks and safety on the Internet: The perspective of European children. Initial Findings*, LSE, EU Kids *Online*, London, 2010, p. 38; BRINGUÉ, X., SÁDABA, C. and TOLSÁ, J., *La Generación Interactiva en Iberoamérica 2010: Niños y Adolescentes ante las Pantallas*, Colección Generaciones Interactivas-Fundación Telefónica, Madrid, 2011, pp. 75-77; *Encuesta Generaciones Interactivas en España*, answer to question 29 "Why do you usually use the Internet? (you can choose more than one answer)": N=8.373, total number of respondents aged 10 to 18.

The descriptive information about the most common *online* activities among minors allows us to identify a number of "dimensions" of use, which are also applied to other screens such as cell phones or video game consoles. In general, we can distinguish four basic needs that are fulfilled with these technologies: (i) relationship, (ii) entertainment, (iii) learning and (iv) consumption.

"Relationship" refers to the use of screens as a way of meeting other people (physically or virtually). It includes ways of sharing the screen (e.g. *online* gaming, surfing together, talking on the phone, using a chatroom), but also other ways that have more to do with the possibility of personal expression (e.g. designing a website or writing your own blog).

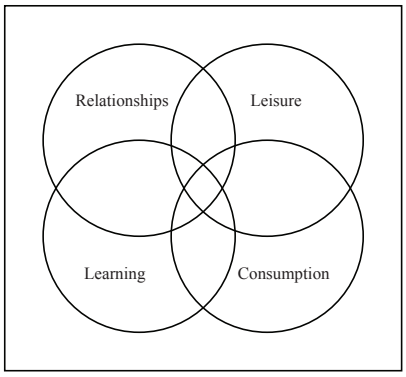
"Entertainment" has to do with the recreational use of the screens: some of it is evident, as in the case of video games (on various platforms), but in other cases it is a dimension that is enjoyed and mixed with another (e.g. chatting is a form of relationship, at the same time, it can be a means of entertainment, of passing the time).

"Learning" through the screens is related to accessing, obtaining or sharing knowledge of very diverse nature. In this sense, we are talking about the ways of obtaining information through the website and the use of different types of software for academic purposes, among other possibilities.

Finally, the dimension of "consumption" is described by the possibility offered by the screens of keeping us informed about the different range of products and services available on the market and their *online* purchase and sale.

As already noted, the use of screens is sometimes clearly encompassed within a particular dimension, while in other cases the boundary between "relationship", "leisure", "learning", and "consumption" is diffuse, and the four areas seem to overlap. This situation is reflected in the following figure:

Figure 1. Dimensions in the use of screens



Source: authors' own.

Using this model as a reference, the specific objective of this research is to explore in a little more depth the nature of the use that children make to the screens in each of their dimensions. So far we have not found any studies that attempt to describe, in a little more detail, the way children and teenagers use the new screens (the Internet, cell phones and video games) to meet different needs, exploring how the various factors that have to do with their use are interrelated. This attempt is, indeed, what we will talk about in the following section of this article, with the results of research that applies principal component analysis.

2. Methodological Considerations

To carry out this work, we proceeded to analyze the results of the survey "The Interactive Generation: Assessment and Use of Screens among 10 and 18 year olds" [6]. The survey is one of the Interactive Generations Forum initiatives[7] and its research tool is an *online* questionnaire consisting of 126 questions organized into the following groups:

a. Respondents' personal data: age, gender, number of household members, occupation of father and mother.

b. Academic data: subjects passed, hours of personal study, aids in doing school assignments, use of technology in academia, and so on.

c. Use of screens (the Internet, cell phone, video games and television): level of equipment, possession and use, amount of time and moment of use, company, content and services used, and so on.

[6] In the appendix 1 we have only attached the questionnaire for this analysis, because we consider that the total questionaire is too long (126 questions). If you wish to access this questionnaire, it is available in BRINGUÉ, X. and SÁDABA, C. (2009), *La Generación Interactiva en España: Niños y Adolescentes ante las pantallas*, Colección Fundación Telefónica, Ariel, Barcelona, 2009. You can also download this study for free at the following website: www.generacionesinteractivas.org, available: September 2011.

[7] The Interactive Generations Forum is a non-profit organization founded in December 2008 by the Inter-American Organization for Higher Education, the University of Navarra and Telefonica S.A. The mission of this forum is to improve people's lives with technology. In order to achieve this goal, they divide their work into 5 different areas: research, training, diffusion, protection and recognition. The Forum works steadily in the following countries: Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Peru, Spain and Venezuela. Their research has involved more than 225.000 students of 3.150 schools.

d. Rating of screens: preferences, attitudes and opinion about opportunities (ease of use, problem solving), attitudes and opinion on risks (dependency and addiction, cyber bullying, etc.).

The surveys were found on the website of the Interactive Generations Forum (www.generacionesinteractivas.org) and the data collection was conducted in the computer rooms of the schools. After a random invitation to the schools, each of them was assigned a unique username and password to access the questionnaire in a controlled way and protect the identity of the participants, as students were never asked for their personal information.

The design and the structure of the survey do not permit repetition from the same user on each question answered or not answered. In addition, there are another two control elements that ensure the quality of the information collected: the time limit for responding to the questionnaire, and the presence of a teacher in the classroom during the data collection. On the other hand, it avoids the problem of contamination, meaning that the students cannot read the questionnaire before answering, which may occur in other surveys.

The selection of this data collection model has many advantages. First, the most important point, the survey is done in an environment that is familiar to the student. On one hand, they do it in school where they know the classroom, the computers, and the teachers; and on the other hand, they are familiar with computers and the Internet, so they operate correctly when they are filling out the survey. The influence of third parties on their answers is also canceled, as there is no interviewer or group that can modify the answers. This system also allows the data to be checked immediately after recording, when the survey is over. Finally, all participating schools receive a detailed report as a basis for the implementation of various training initiatives that are aimed at schoolchildren, families and educators in the field of proper use of technology.

2.1. Design and Sample Treatment

This research focuses on the students enrolled in Primary School (5th and 6th grade, aged 10 to 12), as well as on all of ESO (Compulsory Secondary Education, aged 12 to 16) and Bachillerato (equivalent to the last two years of high school, aged 16 to 18) in Spain, excluding Ceuta and Melilla.

First, we proceeded to choose the schools for which we applied a two-stage sampling. In the first stage, we applied a stratified sampling with proportional allocation according to autonomous community and the type of school (public or private), establishing a minimum of three schools per autonomous community. Considering the average size of the schools, a sample of 78.55 public

schools and 23 private schools was established. The selection of the institutions in the second stage was performed using simple random sampling.

During the year 2009 –from March to June– we obtained the sample of minors enrolled in schools in Spain[8], with the involvement of a total of 113 schools. Assuming a simple random sampling, with a confidence interval of 95% and the case p = q = 50%, the estimation error is + / – 0.86%.

The real sample achieved, of 9.880 Spanish students, underwent an exploratory analysis of data intended to detect mistakes in the design and data collection: (i) the assessment and treatment of missing data and (ii) the identification of outliers. Thus was obtained a valid sample of 9.516 cases[9].

The target of the missing data analysis (Missing Values Analysis) is to detect the so-called non-essential missing data. That is, to check for any non-random pattern in the process of missing data which can skew results and lead to a loss of significance of the sample. Our analysis concluded that the minimum percentage of Missing Values (5%) was not exceeded.

The goal of the second technique or outlier detection is to find those observations with different characteristics from the others. To our knowledge, they are neither beneficial nor problematical, but the type of information they can provide is of importance. Our analysis also proceeded to study whether the extreme values were also influential.

Once these two analyses were concluded, we proceeded to analyze the sample adequacy and to keep the percentages in this order: region, type of school, gender and age.

2.2. Techniques and variables used in the study

As noted above, the specific objective of this research is to study in more detail the use that Spanish children make of three screens in particular (the Internet, cell phones and video games)[10] in all the dimensions possible. To

8 The overall results of this study are available in: BRINGUÉ X. and SÁDABA, C., *La Generación Interactiva en España: Niños y adolescentes ante las pantallas*, Colección Fundación Telefónica, Ariel, Madrid, 2009.

9 Both techniques are done with SPSS 17.

10 The Interactive Generations Forum's questionnaire was focused on four screens: TV, computers/the Internet, videogames and cell phones. The first screen was excluded for this analysis, since we wanted to study the use of devices that allow interactivity and participation, relating them to the four dimensions above mentioned. In this respect, TV was considered of a different nature than the other screens: its consumption usually happens in a one-way direction, being the consumer just a spectator (a passive user).

do so, our starting-point was the model above (see Figure 1), where we can see the four dimensions of the consumption of screens and their possible interrelationships.

Drawing on this sample, we chose those questions in the questionnaire that we felt were directly related to the dimensions of the consumption of screens. There were a total of 23 questions[11], from which we created a total of 40 indicators[12] that measured from the lowest to the highest intensity the above dimensions of consumption. To do so, we included each of the questions in one of the four possible dimensions. Once done, the variables were recoded so that it was possible to measure them, from the lowest to the highest intensity. We have to make clear that since the survey did not include enough questions about the dimension of "consumption", we decided to exclude this category from the analysis[13], and work on the three dimensions that we had more information on: "relationship", "leisure "and" learning".

After creating the indicators, as a prior step to our analysis, 40 indicators were subjected to a nonparametric test[14], in order to see the incidence of two variables, age and gender, and test whether these two aspects have a significant influence for each of the indicators[15].

After doing this analysis, we chose two groups of indicators: those in which there are differences according to gender, and those in which the gender differences are not significant. As for the age variable, it was found that in most indicators the differences were important, and therefore we decided to work only with such indicators, and those in which age differences were not

[11] Questions: nº 14, nº 15, nº 25, nº 26, nº 28, nº 29, nº 30, nº 31, nº 33, nº 34, nº 35, nº 36, nº 37, nº 38, nº 39, nº 40, nº 41, nº 42, nº 43, nº 61, nº 62, nº 92 and nº 98.

[12] The Appendix 2 provides a detailed account of each of the indicators developed.

[13] Only question 29 of the survey asks directly about this issue: the options of buying or selling *online* appear as one of the activities that minors can do when they are surfing the web. In any case, 6,7% of respondents from ages 10 to 18 answered positively, indicating that this dimension does not have a particularly significant impact. Similarly, the proportion of the use of screens that is not explained by the principal component analysis would refer to other aspects such as this. It would be also necessary to explore in future research the issues that include advertisement through this kind of screens.

[14] With the help of SPSS 17 we carried out the Mann–Whitney *U* test, based on the normal distribution approach.

[15] Age and gender were selected *a priori* as two significant variables of influence on minors' use of screens, since it is a very common practice in the research in the field. For example, EU Kids *Online* (Europe), the Pew Research Center (U.S.) or the Interactive Generations Forum (Latin America) very often consider these socio-demographic aspects when analyzing the data from their surveys.

significant were eliminated from the analysis[16]. Thus, for our further analysis we were left with a total of 34 indicators: in 19 cases the gender differences were not significant, and were in the remaining 15.

After this first filter, we proceeded to perform principal component analysis[17], the results of which are explained in the next section.

3. Results of principal component analysis on the dimensions of the consumption of screens

3.1. Explanatory factors of the consumption of screens

Below are several tables showing the results obtained with the principal component analysis on the use of screens in different dimensions. Although there were no more than four factors in each case, the criterion that was adopted when showing the results of the analysis is to choose the number of factors that were sufficient to explain more than 50% of the variance. Therefore, in some cases only three factors were sufficient.

[16] The statistical analysis here presented (based on principal component analysis technique) is part of a wider study in which the final goal was to do a cluster analysis. Therefore, from the start we had to take a consistent approach when we were working with the indicators. Basing on the results of the non-parametric tests, we decided to use only those indicators that were differentiated by age, although we distinguish them into two groups: differentiated and undifferentiated by gender.

[17] The principal component analysis was done using SPSS 17, provided with varimax rotation. In our case, it was required to use this statistical technique nine times: for the groups of Primary School (10-12), ESO (12-16) and Bachillerato (16-18), in each case by the triple [(i) common indicators to both genders because there were no differences, (ii) indicators for girls and (iii) indicators for boys].

Table 2. Principal component analysis of variables that measure the consumption of screens in three dimensions (relationship, leisure and learning). Primary School (10 to 12), common to both genders

Predictor Variables[18]	Factors		
	1	2	3
R25	,239	,010	,012
R28	,099	,020	**,808**
R29	**,599**	,174	,163
R31	**,908**	,108	,145
R33	**,843**	,092	,114
R35	**,795**	,081	,117
R39	**,837**	,098	,155
LS28	,269	,055	**,710**
LS61	,080	,040	,099
LR14	,210	**,935**	,044
LR15	,169	**,942**	,060
LR25	,107	,043	,060
LR26	–,013	,048	,082
LR28	,110	,032	**,660**
MIX41	**,774**	,133	,133
Eigenvalue	4,069	1,857	1,735
% of the explained variable	27,127	12,379	11,567
Total Variance explained by 3 factors	51,073		

Source: authors' own.

[18] To check the specific issues referred to each of the predictor variables, see Appendix 2.

Table 3. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). ESO (12 to 16), common to both genders

Predictor Variables	Factors		
	1	2	3
R28	,097	–,001	**,849**
R29	**,557**	,155	,208
R31	**,878**	,119	,133
R33	**,813**	,086	,063
R35	**,721**	,025	,044
R39	**,840**	,122	,118
LS28	,201	,084	**,789**
LS43	,092	,058	,040
LS61	,089	,010	,024
LR14	,182	**,929**	,027
LR15	,136	**,936**	,059
MIX29.1	**,509**	,210	,166
MIX41	**,617**	,090	,126
Eigenvalue	3,723	1,862	1,474
% of the explained variable	28,637	14,323	11,336
Total Variance explained by 3 factors	54,296		

Source: authors' own.

Table 4. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). Bachillerato (16 to 18), common to both genders

Predictor Variables	Factors			
	1	2	3	4
R25	,282	–,037	,114	**,580**
R26Family	,121	,093	–,002	–,105
R28	,054	–,021	**,806**	,025
R31	**,842**	,166	,122	,127
R33	**,774**	,121	,107	,139
R35	**,708**	–,001	,145	,039
R39	**,823**	,133	,085	,112
LS28	,160	,151	**,730**	,066
LS43	,137	,069	-,007	,106
LS61	,092	,087	,063	**,666**
LR14	,201	**,909**	,004	–,027
LR15	,132	**,915**	,047	,108
LR25	,120	,013	,063	**,668**
LR26	,062	,019	,073	,440
LR28	,180	–,058	**,659**	,112
MIX41	,566	,152	,173	,085
Eigenvalue	3,065	1,796	1,731	1,528
% of the explained variable	19,154	11,223	10,816	9,550
Total Variance explained by 3 factors	50,743			

Source: authors' own.

Table 5. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). Primary School (10 to 12), male

Predictor Variables	Factors		
	1	2	3
R26Social	**,636**	,000	,096
R34	**,747**	,107	,105
R40	**,547**	,247	,162
R43	,218	**,808**	,117
R61	,140	,104	**,837**
R62Family	,023	,052	**,814**
R62Social	,244	,062	**,760**
R92	,173	–,006	,102
R98	,066	,142	,021
LS29	**,708**	,199	,072
LS30	**,778**	,195	,083
LS42	,237	**,853**	,121
LR42	,113	**,787**	,001
Eigenvalue	2,599	2,189	2,038
% of the explained variable	19,993	16,838	15,680
The Total Variance explained by 3 factors	52,512		

Source: authors' own.

Table 6. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). ESO (12 to 16), male

Predictor Variables	Factors			
	1	2	3	4
R34	,073	**,735**	,107	,021
R40	,284	**,544**	,164	–,049
R43	**,820**	,223	,079	,000
R61	,053	,128	**,797**	,110
R62Family	–,040	,115	**,676**	,058
R62Social	,059	,114	**,790**	–,011
R92	,018	,138	,237	**,638**
R98	,060	–,010	-,072	**,837**
LS29	,157	**,726**	,046	,076
LS30	,137	**,781**	,153	,121
LS42	**,775**	,176	,047	,087
LR42	**,721**	,088	–,008	–,020
LR43	**,713**	,104	–,026	,052
Eigenvalue	2,441	2,136	1,850	1,158
% of the explained variable	18,777	16,429	14,231	8,909
Total Variance explained by 4 factors	58,345			

Source: authors' own.

Table 7. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). Bachillerato (16 to 18), male

Predictor Variables	Factors		
	1	2	3
R26Social	,230	,250	,179
R34	,242	,408	**,522**
R43	**,791**	,192	,100
R61	–,013	**,672**	,299
R62Family	,039	**,705**	,125
R62Social	,119	**,808**	–,056
R98	–,027	–,109	,018
LS29	,061	,012	**,859**
LS30	,225	,205	**,774**
LS42	**,739**	,060	,146
LR42	**,757**	,007	,045
LR43	**,638**	–,010	,126
Eigenvalue	2,335	1,925	1,800
% of the explained variable	19,457	16,039	15,002
The Total Variance explained by 3 factors	50,498		

Source: authors' own.

Table 8. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). Primary School (10 to 12), female

Predictor Variables	Factors			
	1	2	3	4
R26Social	**,577**	,059	,118	,111
R34	**,774**	,142	,034	,060
R40	**,561**	,109	–,005	,394
R42	,091	,074	–,046	**,792**
R43	,211	,077	,519	**,685**
R61	,177	**,853**	,030	,092
R62Family	,020	**,833**	,035	–,081
R62Social	,248	**,740**	,024	,162
R92	,212	,135	,154	-,107
R98	,006	–,039	–,071	,097
LS29	**,660**	,152	,171	,039
LS30	**,787**	,075	,210	–,027
LS42	,270	,053	**,802**	,216
LR42	,125	,019	**,855**	,092
LR43	,043	–,001	,279	**,606**
Eigenvalue	2,583	2,069	1,844	1,754
% of the explained variable	17,223	13,790	12,292	11,695
Total Variance explained by 4 factors	55,000			

Source: authors' own.

Table 9. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). ESO (12 to 16), female

Predictor Variables	Factors			
	1	2	3	4
R34	**,734**	,046	,115	,087
R40	**,661**	,080	,112	,323
R42	,107	,062	,022	**,802**
R43	,188	,494	,057	**,703**
R61	,182	,019	**,766**	,052
R62Family	,090	,070	**,687**	-,271
R62Social	,001	–,093	**,704**	,355
R92	,194	,008	,061	–,135
R98	–,029	–,014	,010	,154
LS29	**,748**	,052	,034	,003
LS30	**,688**	,246	,081	–,030
LS42	,196	**,602**	–,094	,337
LR42	,041	**,776**	–,063	,062
LR43	,100	**,716**	,117	,017
Eigenvalue	2,185	1,811	1,622	1,613
% of the explained variable	15,607	12,937	11,583	11,520
Total Variance explained by 4 factors	51,648			

Source: authors' own.

Table 10. Principal component analysis of variables that measure consumption of screens in three dimensions (relationship, leisure and learning). Bachillerato (16 to 18), female

Predictor Variables	Factors			
	1	2	3	4
R26Social	,177	,034	–,101	**,727**
R34	**,744**	,023	,081	,188
R40	,522	–,044	**,548**	–,056
R42	,012	,043	**,891**	,036
R43	,091	,591	**,707**	–,008
R62Social	,006	–,065	,147	**,729**
R98	,056	–,040	–,010	,003
LS29	**,728**	,077	,108	–,121
LS30	**,647**	,251	–,056	,139
LS42	,113	**,607**	,422	,070
LR42	,242	**,653**	,007	–,287
LR43	,024	**,805**	–,006	,087
Eigenvalue	1,890	1,873	1,825	1,228
% of the explained variable	15,754	15,611	15,212	10,230
Total Variance explained by 4 factors	56,807			

Source: authors' own.

The following table summarizes the outcomes of the principal component analysis, differentiating between the specific indicators that make up the various factors for each age group and gender.

Table 11. Summary of principal component analysis on the consumption of screens: factors and indicators that integrate it

	Female	Common to both genders	Male
Primary School (10 to 12)	1. R26Soc/R34/R40/ LS29/LS30 2. R61/R62Fam/ R62Soc 3. LS42/LR42 4. R42/R43/LR43	1. R29/R31/R33/R35/ R39/MIX41 2. LR14/LR15 3. R28/LS28/LR28	1. R26Social/R34/R40/ LS29/LS30 2. R43/LS42/LR42 3. R61/R62Fam/ R62Soc
ESO (12 to 16)	1. R34/R40/LS29/LS30 2. LS42/LR42/LR43 3. R61/R62Fam/ R62Soc 4. R42/R43	1. R29/R31/R33/R35/ R39/MIX29.1/MIX41 2. LR14/LR15 3. R28/LS28	1. R43/LS42/LR42/ LR43 2. R34/R40/LS29/LS30 3. R61/R62Fam/ R62Soc 4. R92/R98
Bachillerato (16 to 18)	1. R34/LS29/LS30 2. LS42/LR42/LR43 3. R40/R42/R43 4. R26Soc/R62Soc	1. R31/R33/R35/R39 2. LR14/LR15 3. R28/LS28/LR28 4. R25/LS61/LR25	1. R43/LS42/LR42/ LR43 2. R61/R62Fam/ R62Soc 3. R34/LS29/LS30

Source: authors' own.

In the next section, we interpret the results of the factor analysis and we show some of the most important conclusions to be drawn from it.

3.2. Interpretation of the results

In order to facilitate the understanding of the results of the principal component analysis and to identify the essential aspects, we decided to assign to each of the resulting factors a "tag" description that summarizes the main information to which it referred. That is, each factor is defined with a short sentence that reflects the type of indicators that are included. In Table 12, we can see in detail the outcome of this work of synthesis (with reference to Table 11), respecting the distinction based on the age (Primary, ESO and Bachillerato) and the gender (common indicators to both genders, male and female).

Table 12. The dimensions of use of the screens: principal component analysis' results

Factor	Level	Female	Common to both genders	Male
1	*Primary School (10 to 12)*	Internet as a way of meeting other people and entertainment	Internet as a tool to communicate with others	Internet as a way of meeting other people and entertainment.
	ESO (12 to 16)			Your own *blogs*/ web as a multidimensional tool
	Bachillerato (16 to 18)			
2	*Primary School (10 to 12)*	The cell phone as a way of communicating with others	Internet as a way of supporting the way yo learn	Your own *blogs*/ web as a multidimensional tool
	ESO (12 to 16)	Your own blog/ web to have fun and learn at the same time.		Internet as a way of meeting other people and entertainment
	Bachillerato (16 to 18)			The cell phone as a way of communicating with others
3	*Primary School (10 to 12)*	Your own blog/ web to have fun and learn at the same time	Internet as a *thief of time*, instead of doing traditional activities	The cell phone as a way of communicating with others
	ESO (12 to 16)	The cell phone as a way of communicating with others		*Online* entertainment includes communicating with others
	Bachillerato (16 to 18)	Internet as a way of expressing yourself and communicating with others		

Factor	Level	Female	Common to both genders	Male
4	*Primary School (10 to 12)*	Your own blog/ web as a way of expressing yourself.		
	ESO (12 to 16)			Video gamers who appreciate traditional relationships
	Bachillerato (16 to 18)	Internet and cell phones as a way of reinforcing personal relationships	Internet and cell phones are activities that you can share with your firends	

Source: authors' own.

In the next section, we will explain the meaning of the different "tags", so that we can see how the dimensions of use of the screens are interrelated: relationship (marked with an "R"), leisure (marked "LS"), learning (marked with an "LR") or mixed, if we considered *a priori* that the indicator could not be included in any exclusively category (indicated with a "MIX").

3.2.1. Common indicators to both genders: Internet to communicate with others, such as learning support, as a thief of time, and as a phone activity shared with friends

As shown in the table, there are three factors that equally define an essential part of the consumption of screens by minors (both females and males), regardless of their gender.

First, we defined the use of Internet as a "tool to communicate with others," although the number of elements that measure this question varies slightly depending on the academic year that we are dealing with.

Thus, in the case of Primary School this factor refers to the use that children give to Internet as a way to socialize (R29). It also refers to the use of chatrooms / Messenger (R31) with a webcam (R33), and the fact of having *online* friends or having met them in person (R35). Finally, it refers to two specific uses of Internet: social networks (R39) and the creation of your own blog or website (MIX41).

In the case of ESO we take into account a greater number of indicators. It refers to the way youngsters use the Internet to meet others (R29). It also

includes the use of chatrooms / Messenger (R31) with a webcam (R33), and whether they have met with *online* friends (R35). It also refers to the use of social networks (R39). It also means if they visit different kinds of websites while they are *online* (MIX29.1) and if they have their own blog or website (MIX41).

Finally, in the case of Bachillerato we take into account a smaller number of indicators: the use of chatrooms / Messenger (R31) with a webcam (R33) and having or meeting *online* friends in person (R35). It also refers to the use of social networks (R39).

The second factor, common to all the children, is the same for students in Primary School, ESO and Bachillerato, and has to do with the use of the Internet as a "tool to support the way you learn". It refers to the way children use computers / Internet to help with their homework (LR14), and the number of different tools (search engines and websites, interactive CDs, digital encyclopedias, Office-type programs) they use as tools to do their homework (LR15).

The third factor common to all the children refers to the use of the Internet as a "*thief of time* instead of doing traditional activities," although there is a slight difference depending on the school level (Primary School, ESO and Bachillerato).

In the case of Primary School and Bachillerato, it refers to the reduction in the time the youngsters spend on relationships (R28), leisure (LS28) and learning (LR28) in real life (family, friends, talking on the phone, sports, reading, television, video games, studies) because of their use of the Internet.

In the case of the ESO, we only take into account the time that the Internet has taken away from relationships (R28) and leisure (LS28) in real life, but learning is excluded.

The fourth factor, referring exclusively to Bachillerato, links the fact of going *online* on a friend's house or at school (R25, LR25) with the recreational uses that are given to cell phones (LS61). This relationship may mean that those moments of sharing the Internet (either at school or at home) are conceived as a moment of leisure, "hanging out", when they can seize the opportunity of using other screens such as cell phones for fun.

3.2.2. Exclusive indicators for females

3.2.2.1. First factor: "Internet as a way of meeting others and entertainment"

In the case of Primary school, it describes their company (friends, boyfriends) when they surf the Internet (R26Social). Also the number of people they communicate with through chatrooms / Messenger (R34) and the number of social networks they belong to (R40). This factor also refers to the

recreational uses that girls give to the Internet (digital TV and radio, downloads) (LS29) and the entertainment content they visit on the Web (LS30). Therefore, this factor jointly measures the way they relate with others and how they entertain themselves via the Internet.

In the case of ESO, we find a smaller number of indicators: the number of people that girls communicate through chatrooms / Messenger (R34) and the number of social networks they use (R40). On the other hand, it includes the way they use Internet for entertainment (television and digital radio, downloads) (LS29) and the entertainment content they visit *online* (LS30).

In the case of Bachillerato, it includes an even lower number of indicators: the number of people with whom they communicate through chatrooms / Messenger (R34), and the way young women use the Internet to entertain themselves (digital television, digital radio, downloads) and visiting entertainment content on the Web (LS29, LS30). Therefore, it refers to the *online* relationships and entertainment.

3.2.2.2. Second factor: "The cell phone as a way of communicating with others" (Primary School) and "Having your own blog/web to have fun and learn at the same time" (ESO and Bachillerato)

The second factor that defines the Primary School girls refers to the different ways they use their cell phones (talk, SMS, chat, take photographs or video) to interact with others (R61). It is also important to know what kind of individuals (family, friends, boyfriend) they communicate with through this screen (R62Family/R62Social). In other words: this factor explores the different kinds of relationships they have through cell phones.

In the case of ESO and Bachillerato, we must focus on the creation of blogs or websites, and examine the content of those sites, as well as the motivations that may lead them to create a blog or website. In this case, it is important to focus on the entertainment content (LS42) or the content used to learn (LR42), connected to the utility they find on blogs in order to use them as learning tools (LR43). In other words, this factor refers to leisure and learning linked with the creation of a blog or website.

3.2.2.3. Third factor: "To have your on blog/web to learn and have fun at the same time" (Primary School), "The cell phone as a way of communicating with other people" (ESO) and "Internet as a way of expressing yourself and communicating with others" (Bachillerato)

The third aspect that defines Primary School girls has to do with entertainment (sports, television, games, humor, music, contests, adults) (LR42) or learning (news, educational, cultural) (LR42) on their own blog or website. Therefore, it refers jointly to *online* entertainment and learning.

For ESO girls, it refers to the different uses (talk, SMS, chat, take photos or video) they make of their cell phones to interact with others (R61). It is also important to know which specific people (family, friends, boyfriend) they communicate with through this screen (R62Family/R62Social). In other words, this factor explores relationships through the cell phone.

The third factor related to Bachillerato students refers to a purely social use of the Internet: it includes the number of social networks used by teenagers (R40). It also refers to their creation of personal history blogs (R42) and the use they make of them in the field of relationships (R43). So we can clearly see the importance of the relationship dimension in the use of the Internet.

3.2.2.4. Fourth factor: "The blog / website as a means of self-expression" (Primary School and ESO) and "the Internet and cell phones as a way of strengthening personal relationships" (Bachillerato)

For Primary Schools students, focusing on those who have their own website or blog, this factor refers to whether this blog is about their personal history (R42). This is linked to the use they make of this kind of blog / web to interact with others and contribute to a learning community (R43/LR43). Therefore, in the case of girls it appears that their use in the fields of relationships and even in that of learning is closely linked to self-expression through the Internet.

For ESO, the factor refers to the social dimension of creating a blog or website. Thus, having a personal history blog (R42) is positively related with the use they make in this kind of activity for the field of relationships (R43).

Finally, in the case of Bachillerato teenagers, the factor refers to the company of friends or boyfriends when they are *online* (R26Social) linked with the communication through cell phones with these same people (R62Social). Therefore, we see that for the older girls communication and the environment

with their friends or their boyfriends are important, and the relationships with them are reflected on screens such as the Internet or cell phones.

3.2.3. Exclusive indicators for males

3.2.3.1. First factor: "Internet as a way of meeting people and entertainment" (Primary School) and "Your own blog/web as a multidimensional tool" (ESO and Bachillerato)

Firstly, what defines the Primary School boys when they are *online* is their company (friends, girlfriend) (R26Social). Also the number of people they communicate with through chatrooms / Messenger (R34) and the number of social networks that they belong to (R40). This factor also refers to the recreational use boys give to the Internet (TV and radio, digital downloads) (LS29) and visiting entertainment content on the Web (LS30). Therefore, this factor jointly measures the way they relate with others and how they entertain themselves via the Internet.

The factor that first describes the students of ESO and Bachillerato refers to the creation of their own blog or website: attention must be paid to the content included on these pages, as well as the motivations that may lead them to create them. In this case, it is important to focus on entertainment content (LS42) or the learning content (LR42), connected to the use they make of blogs as tools to relate with others (R43) and learn from other people (LR43). In other words, leisure, learning and relationships are linked on the creation of their own blogs/websites.

3.2.3.2. Second Factor: "Having your own blog/web as a multidimensional tool" (Primary School), "Internet as a means of meeting others and as entertainment" (ESO) and "The cell phone as a means of communicating with others" (Bachillerato)

The second factor that describes the Primary School youngsters is quite similar to the previous one. In this case, it is important to focus on the entertainment content (LS42) or learning content (LR42), linked to the utility found on blogs as a tool to meet others (R43). Therefore, leisure, learning and relationship are linked from the creation of their own blogs / websites.

In the case of ESO, the second factor includes the number of people young people communicate with through chatrooms / Messenger (R34) and the number of social networks they use (R40). It also refers to their use of the

Internet for entertainment (television and digital radio, downloads) (LS29) and visiting entertainment content on the Web (LS30). Therefore, we must focus on the intensity with which youngsters from ESO use the Internet to meet their needs for relationship and leisure, which seem to be linked.

Finally, the second factor that shapes the teenagers of Bachillerato refers to the different uses (talk, SMS, chat, taking photos or video) that they give to cell phones to meet others (R61). It is also important to know with what kind of people (family, friends, girlfriend) they communicate with through these screens (R62Family/R62Social). In other words: this factor explores the types of relationships they have through the cell phone.

3.2.3.3. Third factor: "The cell phone as a means of communicating with others" (Primary School and ESO) and "Having fun online includes talking with others" (Bachillerato)

The third factor that defines the Primary and ESO boys refers to the different uses (talk, SMS, chat, taking photos or video) they make of their cell phones to communicate with others (R61). It is also important to know what kind of individuals (family, friends, and girlfriend) they communicate with through this screen (R62Family/R62Social). In other words: this factor explores the types of relationships they have through the cell phone.

In the case of Bachillerato, the third factor that defines teenagers refers, on the one hand, to the number of people that they communicate with through chatrooms / Messenger (R34). On the other hand, it covers the uses that they make of the Internet as an entertainment tool (television and digital radio, downloads) (LS29) and the entertainment content they visit *online* (LS30). Hence, we must focus on the intensity with which ESO boys use the Internet as a way of meeting others and entertainment, which seem to be linked.

3.2.3.4. Fourth Factor: "The gamers who appreciate traditional relationships" (ESO)

This factor takes into account the company that children have when they are playing video games (R92), positively linked to the time that they have misused instead of relating with others (family, friends, talking on the phone) (R98). This factor could be understood this way: this group of children gives more importance to relationships, to spending time with their friends, and this is why they do not frequently play alone. However, despite the fact of playing with others, the youngsters still consider they are wasting their time for socia-

lizing and that they could use their time in another, perhaps a more traditional way (being with friends or family, doing sport, going to the movies, etc.).

4. Conclusion and future lines of research

This study highlights the utility of principal component analysis when studying the use of screens by minors. The statistical analysis here presented attempts to bring a new perspective on the field, for it indicates the most important elements to consider when studying the dimensions of use of technologies by children and teenagers, and the ways these dimensions are interrelated.

In this sense, it is particularly relevant that the dimensions of "relationship", "leisure" and "learning" are linked in several of the factors resulting from the analysis. A clear reflection of this integration is the case of creating one's own blog and/or website. This integration reinforces the idea that minors, by using the various screens that are available to them, do not take into account the support itself as much as the need they satisfy by using it. As a consequence, it does not make much sense to talk about the use of screens in a separated way, but rather about the satisfaction of a need for relationships, leisure and learning when they are used.

In the future, it would be of great interest to make an in-depth study of the use of certain tools with a multidimensional nature (e.g.: social networks –in a broad sense that includes not only sites such as Facebook, Twitter or YouTube, but also virtual communities and certain kinds of *online* games such as Second Life or The Sims) and see how these tools satisfy children's needs of relationships, leisure, learning or consumption.

Likewise, it would be valuable to study the dimension of "consumption" through the screens. This dimension not only refers to the ability to buy or sell through technology, but also to the advertising communication that takes place through these screens.

Finally, this analysis reflects the importance of dealing with the juvenile public as a heterogeneous group. Although there are some common aspects that equally define all members of this public, there is also a clear difference when we take into account the variables of gender and age. It may be supposed that other variables, apart from these (e.g. the media literacy of children, their attitudes and preferences, parental control, the school environment, socio-economic status, etc.) will also determine the use that children make of screens and, undeniably, taking all these elements into account could be useful to identify different types of users and address the reality of each one in a different manner.

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Appendix

Appendix 1

Questionnaire " Interactive Generation: assessment and use of screens of minors of ages 10 to 18 years old".

Questions used in the survey for Elementary students from 5th grade of Primary School to 2nd year of Bachillerato and Professional Training (FP)

14. Do you use the computer or the Internet to do your homework or study?
- ❑ No (go to question 16)
- ❑ Yes

15. What kind of technological tools do you use to help with these two tasks? (You can choose more than one option)
- ❑ Internet: search engines and websites
- ❑ Interactive CD
- ❑ Digital Encyclopedia
- ❑ Word, Power Point, Excel… to do essays and presentations

25. Where do you usually use the Internet (to go *online*, chat, e-mail)? (You can choose more than one option)
- ❑ At home
- ❑ At school
- ❑ In a cyber café
- ❑ In a public place (such as: libraries, youth centers…)
- ❑ At a friend's house
- ❑ At the home of a relative

26. Most of the time when you use the Internet you are usually with… (You can choose more than one option)
- ❑ Alone
- ❑ With your brother or sister
- ❑ With your mother
- ❑ With a teacher
- ❑ With your friends
- ❑ With your father
- ❑ With your girl/boyfriend

28. Using Internet takes time from what kind of activities? (You can choose more than one option)
- ❑ Family
- ❑ Studying
- ❑ Reading
- ❑ Videogames
- ❑ Nothing
- ❑ Friends
- ❑ Sports
- ❑ TV
- ❑ Talk on the phone

29. Why do you usually use the Internet? (You can choose more than one option)

- ❑ To visit websites
- ❑ Send SMS
- ❑ Share videos, pictures. presentations... (Youtube, Flickr, SlideShare, Scribd...)
- ❑ To check your e-mail
- ❑ Digital TV
- ❑ Digital Radio
- ❑ To use programs (Word, Excel)
- ❑ To download music, programs and videos
- ❑ Buy or sell (Ebay, Segundamano.es, etc.)
- ❑ Forums or mailing lists
- ❑ Blogs
- ❑ Photologs
- ❑ Talk on the phone (e.g. Skype or MSN)

30. When you visit websites, which of the following things do you usually check? (You can choose more than one option)

- ❑ Sports
- ❑ TV Programming
- ❑ Educational
- ❑ Games
- ❑ Humor
- ❑ Adult content
- ❑ Software and IT
- ❑ News
- ❑ Cultural
- ❑ Music
- ❑ Competitions

31. Do you usually use any of the following to communicate with others *online*?

- ❑ Chatrooms
- ❑ Messenger
- ❑ Both of them
- ❑ Neither of them (go to question 36)

33. When you are chatting or you are using MSN, do you usually use a webcam?

- ❑ Never
- ❑ Sometimes
- ❑ Always

34. Who do you usually talk to when you chat or use MSN? (You can choose more than one option)

- ❑ With friends
- ❑ With family
- ❑ With virtual friends

35. Have you met any of your virtual friends in person?

- ❑ I don't have any virtual friends
- ❑ I have virtual friends but we haven't met

❑ I have virtual friends and I have met a few of them

36. Do you usually use the Internet for networking games?
❑ No (go to question 39) ❑ Yes

37. What type of networking games have you played lately? (You can choose more than one option)
❑ Virtual Community Games (The Sims...)
❑ Racing Games (Need for Speed, Death Race, Shangay Street Racer...)
❑ Strategy and battle games (Teeken, Counter Strike...)
❑ Sport Games (FIFA 2008...)
❑ Board and card games (Poker, Ludo, Trivial, Pictionary...)
❑ Casinos (Casino Monaco, Casino Tropez...)
❑ Role-playing Games (RPGs) (Virtual Galaxy, Guild Wars, Solaris...)
❑ None of them

38. If you use networking games where you can play with others through the Internet, do you agree with some of the following statements? (You can choose more than one option)
❑ I use networking games with my friends
❑ Networking games help you to make friends
❑ I don't agree with either

39. Do you usually use social networks (Tuenti, Facebook, etc)?
❑ No (go to question 41) ❑ Yes

40. Which social networks do you usually use? (You can choose more than one option)

❑ Facebook	❑ Orkut	❑ Hi5
❑ Tuenti	❑ MySpace	❑ WindowsLiveSpaces
❑ LinkedIn	❑ Sonico	❑ Other social networks

41. Have you ever made a blog or a website?
❑ No (go to question 44) ❑ Yes

42. With what kind of content? (You can choose more than one option)

❑ Sports	❑ Software and IT	❑ TV programming
❑ News	❑ Educational	❑ Cultural
❑ Games	❑ Music	❑ Humor
❑ Contests	❑ Adult content	❑ Personal History

43. What is the most useful reason for having your own blog or website? (You can choose more than one option)
❑ Expressing your opinions
❑ Sharing information with people you know

❑ So people can know you and be able to make new friends
❑ Write about what you love
❑ It relaxes me
❑ To give useful information to others that are interested in the subject
❑ To tell everyone what you can't say in person

61. You mainly use the cell phone for... (You can choose more than one option)

❑ Talk ❑ SMS ❑ Chat
❑ Go *Online* ❑ Play Games ❑ As a clock or an alarm
❑ To see pictures and/or watch videos
❑ Take pictures ❑ Make Videos ❑ As a directory
❑ As a calculator ❑ To listen to music or the radio
❑ To watch TV
❑ Downloads (pictures, games, tones, backgrounds...)

62. Who do you usually communicate with more often over the phone? (You can choose more than one option)

❑ With my mother ❑ With my father
❑ With my brother/sister ❑ With other relatives
❑ With my friends ❑ With my boy/girlfriend

92. Who do you usually play videogames with? (You can choose more than one option)

❑ I play by myself ❑ With my mother
❑ With my father ❑ With my sister/brother
❑ With my friends

98. Where have you taken time from to play videogames? (You can choose more than one option)

❑ Family ❑ Friends ❑ Studying
❑ Sports ❑ Reading ❑ TV
❑ Talk on the phone ❑ From nothing

Appendix 2

List of the indicators used for the analysis of the dimensions of "relationship", "leisure"' and "learning"

Relationships

–R25: measures if they go *online* in a friend's house, "No" being the minimum value and "Yes" the maximum value.

–R26Social: measures their company when they go *online* (a friend or a girlfriend or boyfriend) (from 0 to 2).

–R26Family: measures if they go *online* in the company of their parents or brother/sister (from 0 to 3).

–R28: measures if they have taken time from real ways of relating with others (family, friends or talking on the phone) since they use the Internet (from 0 to 3).

–R29: measures the different uses they make of the Internet to establish a relationship with others, having up to 7 different kinds of uses.

–R31: measures the use of *chats* or *Messenger*, and may be both or neither of them.

–R33: measures whether they use a webcam when they use the *chatrooms/Messenger*, "never" being the minimum value and "always" the maximum value.

–R34: measures the number of people they talk to on *chatrooms/Messenger*, from none up to three different types.

–R35: measures if they have, or if they have met their virtual friends, "I don't have any virtual friends" being the minimum value and "I have and I have met some of them" the maximum value.

–R36: measures the use of Internet to play networking games, "no" being the minimum value and "yes" the maximum value.

–R37: measures the different types of networking games they use, with 7 different types of scoring.

–R38: measures the use of networking games as a way of strengthening friendship or making new friends, from the lowest to the highest sociability.

–R39: measures the use of social networks, "no" being the minimum value and "yes" the maximum value.

–R40: measures the different kind of social networks they use, with up to 9 different possibilities.

–R42: measures if the content of their personal blog or Website is about their "personal history", "No" being the minimum value and "Yes" the maximum value.

–R43: measures how useful they feel having their own blog or webpage is, from none to 5 different kinds of options.

–R61: measures the different kind of use they give to cell phones, from none to 5 different kinds of possibilities.

–R62Family: measures the use of cell phones to communicate with their family, from none to 4 different kinds of people.

–R62Social: measures the use of cell phones to communicate with their friends or girlfriend or boyfriend, from neither to both of them.

–R92: measures the use of video games with others, from none to 4 different types of people.

–R98: measures the time they have taken away from traditional way of relating with others (family, friends, talking on the phone) since they use videogames, from none to the 3 options.

Learning

–LR14: measures the use of computers/the Internet to do homework or study, "no" being the minimum value and "yes" the maximum value.

–LR15: measures the different kinds of tools they use when they use the computer for these things, with the option of choosing neither of them to 4 different kinds of options.

–LR25: measures the use of the Internet at school, "no" being the minimum value and "yes" the maximum value.

–LR26: measures the use of the Internet in the company of a teacher, "no" being the minimum value and "yes" the maximum value.

–LR28: measures if they have started to study less since they use the Internet, "no" being the minimum value and "yes" the maximum value.

–LR29: measures the use of programs (Word, Excel) to learn, "no" being the minimum value and "yes" the maximum value.

–LR30: measures the number of contents related with learning (software and IT, educational, and cultural) they visit on the Web, with options from none to 3 different kinds.

–LR42: measures the number of contents related with learning (software and IT, news, educational, and cultural) in their own blogs or websites, with options from none to 4 different kinds.

–LR43: measures the utility of having your own blog or webpage "to give useful information to those who are interested", "no" being the minimum value and "yes" the maximum value.

–LR98: measures if they have studied less since they play videogames, "no" being the minimum value and "yes" the maximum value.

Leisure

–LS28: measures the time they have taken from traditional activities (sports, reading, TV, videogames) to go *online*, with options from none to 4 different kinds.

–LS29: measures the different kind of use they give to Internet to entertain themselves, with options from none to 4 different kinds.

–LS30: measures the entertainment content they visit on the web, with options from none to 8 different kinds.

–LS42: measures the entertainment content they include in their own blogs or webpages, with options from none to 7 different kinds.

–LS43: measures if the utility of having your own blog or website is "writing about what you like the most", "no" being the minimum value and "yes" the maximum value.

–LS61: measures the different kinds of uses they give to their cell phone to entertain themselves, with options from none to 5 different kinds.

–LS98: measures if they have taken time from their leisure time (sports, reading, TV) to play videogames, with options from none to 3 different kinds.

Relationships/Leisure/Learning

–MIX29.1: measures if the use the Internet to "visit webpages" (that can be included in 3 dimensions), "no" being the minimum value and "yes" the maximum value.

–MIX41: measures if they have made their own blog or webpage (that can be included in 3 dimensions), "no" being the minimum value and "yes" the maximum value.