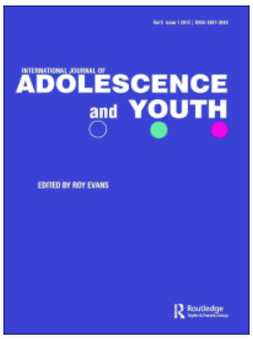

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Digital vulnerability in young people: gender, age and online participation patterns

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ABSTRACT

While the Internet is an important social environment, it can also be a devastating place with negative consequences for young people's psychological well-being. This study examined associations among sociodemographic factors with patterns of participation in online activities such as gambling, betting, online shopping, videogames and eGames. A chi-square-test, Mann-Whitney U-test and multivariate correspondence analysis of an online survey administered to 1500 young people (aged 18 to 35) found gender differences with regard to digital vulnerability. Young women's digital habits and emotional experience (insecurity, social pressure, helplessness, feeling empty and anxiety) contribute to increased risk. Younger men participate in leisure activities perceived to be less risky (videogames and eGames), while older men have a higher level of participation in activities perceived to be riskier (betting and gambling), which are associated with negative emotions. Younger subjects also experience emotions of insecurity and shame through most of their daily time on social media.

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KEYWORDS
Digital vulnerability; young people; gender; age; risks, internet, social media, emotions, media literacy

Introduction

The current digital society has driven the use of technology in many of our day-to-day activities, empowering the digital capability of citizens and providing major opportunities. However, it also has a negative impact on people's quality of life by generating a series of risks in their relationship with the Internet (Cabello-Hutt et al., 2018; Livingstone & Helsper, 2010; Qian et al., 2022).

Some authors have linked the risks encountered by users in the digital environment with the concept of 'harm or damage', referring to 'any situation that entails a possible violation of a user's life while on the Internet' (Torres-Hernández et al., 2022, p. 1582).

Online risks can take on many forms including threats to data privacy, online gossip and rumours, online harassment such as cyber stalking, and exposure to inappropriate and unwanted content (Boyd & Ellison, 2007)).

Studies show that young people tend to face the most risks in the digital environment (Mitchell et al., 2003; Sasson & Mesch, 2014). While they show more use and exposure to the Internet and social media (International Advertising Bureau, Estudio Anual de Redes Sociales, 2022), they are sometimes unaware of many digital dangers due to their inexperience and lack of knowledge regarding the situations they may encounter (Blais & Weber, 2006; Martínez Pastor et al., 2013), which ultimately translates into greater vulnerability.

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Social and demographic factors linked to digital vulnerability among young people

Online vulnerability is the capacity to experience detriments to psychological, reputational or physical wellbeing due to risk encountered whilst engaging in online activities (Davidson & Martellozzo, 2013). Digital vulnerability also refers to 'those individuals or groups likely to suffer harm through their access and exposure to media and social media and services in an information society' (Fuente-Cobo, 2017, p. 9). Along the same lines, García-Jiménez and Jorge (2019) link the concept to 'the risks that a particular individual or group may face either within the virtual world or because of it' (p.11), while highlighting that adolescents and young people constitute an especially vulnerable audience in the digital context.

However, risk perception is based on 'value judgements that turn into the ability to detect, identify and react to problematic situations when browsing the Internet, and not so much on the degree of awareness of the dangers involved' (Ramos-Soler et al., 2018, p. 77). García Del Castillo (2012) and Byrne et al. (2016) point out how risk perception is shaped by the information and experiences accumulated by young people over the course of their time online. Furthermore, as a situation becomes better known or familiar, the perception of any risk decreases (Weber, 2006), and Internet users generally carry out the activities that they do not perceive as particularly risky on the most frequent basis (Byrne et al., 2016).

How young people deal with risks online is related to a set of factors linked to the use of technology (Internet and social media) and a series of socio-demographic variables (Gerulaitienė & Šidagytė, 2016; Livingstone & Helsper, 2010; Sasson & Mesch, 2014).

The most frequent use of the Internet and social media is found among 18–24 year olds (93% of young people access them every day compared to the average of 85% for the Spanish population). Young people also spend the most time online every day (1 hour and 28 minutes on average) (International Advertising Bureau, Estudio Anual de Redes Sociales, 2022). This high exposure to the Internet and social media, alongside their reduced risk perception and greater trust in the Internet (68.5% of 18–24 year olds say that they have a considerable or high degree of trust, compared to the 60% average for the Spanish population, ONTSI – Spanish National Observatory of Technology and Society, 2022), are factors that increase their vulnerability within a digital context.

Previous literature with a gender perspective found that being female is a risk factor associated with problematic use of the Internet (Rial et al., 2015). The risk type is also different as boys are more exposed to sexual images online, while girls tend to encounter more situations of sexting, and sextortion (Villanueva Blasco & Serrano Bernal, 2019) and receive more hurtful messages.

Other studies have investigated how gender influences the type of experiences that young people have in the digital environment: girls may be more vulnerable to online sexual exploitation and harassment, while boys are more likely to engage in online harassment and aggression (Hinduja & Patchin, 2013; Kowalski et al., 2014). Gerulaitienė and Šidagytė (2016) found that although girls are better able to recognize online dangers than boys, they tend to be more at risk as they are more exposed online, since they give out more personal information about themselves.

Age is also an important variable in relation to more problematic Internet use as the greatest conflicts occur at the youngest ages, especially in adolescence (Cabello-Hutt et al., 2018; De la Villa Moral & Suárez, 2016; Estévez et al., 2009). As young people age, their use of the Internet becomes more normalized, and they use it more appropriately (Derbyshire et al., 2013), more professionally, and with a less recreational purpose (Beranuy et al., 2009). Furthermore, the older people become, the more they sense the risks of excessive Internet use and its negative consequences. The experience gained over the years helps them to be more aware of its adverse effects (Labrador & Villadangos, 2010), which in turn lowers their trust in the digital world (ONTSI, 2022).

Regarding the socioeconomic level, Hargittai (2010) and Livingstone and Helsper (2010) found that middle-class young people benefit more from online opportunities than working-class young people. Moreover, in families with greater purchasing power, parents tend to have more experience with technology and are more digitally capable. They can therefore provide their children with more

guidance and support than less affluent families (Vekiri, 2010). Livingstone et al. (2011) found that young people with a higher level of education were less vulnerable to digital risks.

Risky activities and emotions in the online environment

Some activities related to the use of technology can be considered indicators of digital vulnerability, especially among young people and adolescents. It is at these stages that such activities begin, before reaching a peak in adulthood, and they may lead to addictive behaviours or other psychological disorders (Estévez et al., 2017).

Many authors have studied various risky behaviours related to Internet use and social media, such as their abusive use (Griffiths, 2000; Helsper & Smahel, 2020; Tóth-Király et al., 2021), as well as other pathological behaviours related to video games, gambling and betting (Chóliz et al., 2021; González-Cabrera et al., 2022; Griffiths et al., 2012).

Another significant behaviour associated with the use of technology is compulsive buying due to its negative consequences on the individual's life (Andreassen et al., 2015; Müller et al., 2019). Several factors increase the risk of compulsive buying such as: the one-click convenience of having access to a greater and varied number of products (Niedermoser et al., 2021); the ease of being able to shop anytime, anywhere, faster and without having to physically transport the purchased goods (Kuss et al., 2018); the social anonymity and associated disinhibition, which may encourage more excessive behaviour (Sun & Wu, 2011); and finally, the highly dynamic nature of the media which generates frequent temptations and repeated stimuli, favouring cognitive overload and less self-control (Rose & Dhandayudham, 2014).

Negative emotions experienced in the online environment may be another observable indicator of vulnerability in young people. Some studies indicate that young people may experience depression, anxiety and stress while browsing the Internet and especially on social media. They may feel pressured and increasingly uncomfortable as a result of constantly comparing themselves to others (Moreno et al., 2011; Twenge et al., 2018.

Precedents for the existence of a gender gap have also been found in the literature reviewed. The report 'Negative comments on social media' from the Mapfre Foundation and the University of Deusto finds that women are most affected (experiencing higher levels of insecurity, fear, sadness, nervousness and problems related to food and sleep than men) when they receive negative comments on social media that criticize ideas or behaviour; followed by harmful private messages regarding their physical appearance or messages with sexual connotations, especially in the group of younger women aged 18 to 25. Furthermore, women are more annoyed by the risks they experience online (Livingstone et al., 2011) and, in general, have more negative emotional consequences (Carvalho et al., 2018; De la Villa Moral & Suárez, 2016; Moreno et al., 2011; Twenge et al., 2018).

The Internet and social media are therefore a space where, as in offline life, young people are maturing and improving their digital skills in the face of possible risks that may be encountered (García et al., 2014; Lopez-Sintas et al., 2020). This increased experience and knowledge of digital skills reduces their digital vulnerability by enabling them to develop their own strategies or control mechanisms to better safeguard their security and privacy (Tynes, 2007).

Aim and hypothesis of the study

Based on the above background, the following questions on the vulnerability of young people in the digital environment constitute the starting point for this research:

(1) Are there differences according to socio-demographic variables in young people's behaviour, activities and emotions in the online environment?
(2) Can participation in digital play activities be associated with upsetting emotions despite their pleasurable nature?

In line with these premises, the general objective of this study focuses on the behaviour, online activities, risk perception and emotions experienced by Spanish young people between the ages of 18 and 35, as well as the socio-demographic and behavioural factors that may lead to greater vulnerability, with special interest in possible gender differences or gaps.

In view of the above objectives, the aim is to test the following research hypotheses:

- H1: There are significant differences regarding young people's use of the Internet and their engagement in potentially risky online activities based on their sociodemographic patterns.
- H2: There is no equality in the emotions felt by young people, with gender being one of the factors associated with their emotional vulnerability.
- H3. There is a link between young people's participation in certain playful online activities and the feeling of certain negative or upsetting emotions.

Materials and method

Participants

The population studied consists of young residents in Spain both male and female, aged 18 to 35 years old. The sample selection (1500 respondents) was obtained from an online panel by selecting the final sample units, i.e. individuals, randomly. CAWI (Computer Assisted Web Interviewing) was used to obtain the information. The sample size used corresponds to an indicative error in the assumption of simple random sampling of ±2.58% for a confidence level of 95.5% (P=Q = 50% and 2 sigma). Quotas of gender, age and region were set to ensure the representativeness of the sample based on the resident population data according to the INE (Spanish National Statistics Institute) in 2021 (INE Base$_a$, 2021). The gender-based distribution of the sample is 50.7% male and 49.3% female, and age-based distribution: 20.6% of young people aged 18 to 21, 20.6% aged 22 to 25, followed by 28.1% aged 26 to 30 and, finally, 30.7% over 30.

Instrument

The information was collected using a structured online self-questionnaire during March 2022. The choice of activities and emotions analysed was based on the results of the 2018 EU Kids Online survey on children's online activities, mediation, opportunities and risks in the age of media convergence (Garmendia et al., 2019) and in various studies and reports on cyber-bullying risks (Garitaonandia et al., 2020; Garmendia et al., 2016; Hernández et al., 2018; Livingstone et al., 2011; Osorio-Tamayo & Millán Otero, 2020; Galbava et al., 2021; Ramos-Soler et al., 2018; Romera et al., 2021).

Table 1 includes a description of the constructs and observable variables analysed. Indicators of young people's vulnerability in the online environment have been taken as indicators of their behaviour on the Internet and social media, their emotions, the activities in which they participate that may lead to risks, and their risk perception.

In this article, we have analysed five activities in the digital environment as indicators of potential risk which stand out for their recreational and leisure nature, and whose non-responsible use can lead to problematic behaviour: gambling, betting, eGaming, video games and online shopping (following the classification of El Asam and Katz (2018), on the category of 'conduct' considered risky which occurs in the online environment). In addition to the variables previously mentioned, the sociodemographic patterns of young people have been included through different observable variables (Table 1).

In this context, it is important to point out that, concerning gender, respondents were asked using the conventional classification with three response options: Male/Female/Don't know or No answer. In our study, all valid respondents indicated one of the two binary gender options.

Table 1. Constructs and observable variables under study.

Elements of study	Observed variables
Sociodemographic characteristics of Spanish young people	Gender, age, level of studies, social class, living group
Behaviour of young people on social media and the Internet	Frequency of social media use Daily social media exposure time
Activities carried out on the Internet	Frequency of activities recoded in terms of presence/absence of participation in: • Videogames (console gaming or other devices) • Betting (e.g. sports.) • eGames (online competitions) • Online shopping • Gambling (e.g. casino, poker, roulette, slot machines, etc.)
Emotions experienced by young people when interacting in the digital environment	Frequency of emotions recoded in terms of presence and lack of: • Fear • Anxiety • Lack of respect • Insecurity • Helplessness • Social pressure • Feeling empty • Loss of control of information • Shame
Self-perceived risk	Self-perceived risk (1 to 5 points, presence/absence) in the activities: • Gambling • Betting • eGames • Compulsive shopping

There is a possibility, as Kosciesza (2023) suggests, that this traditional form of questioning may have limited the measurement of gender beyond the binary. Hence, it would be advisable to incorporate a new methodological approach henceforth that takes gender diversity into account.

Data analysis

The analysis methodology required recoding the observable indicators of both emotions and activities into two categories (presence/absence), given the high number of variables, and in order to identify the significant relationships for ease of comparison.

Due to the large number of variables analysed and in order to facilitate the understanding and visualization of the data, two of the analysis variables have been recoded into two categories (presence/absence), following other similar studies related to risk activities (Bozzato et al., 2020; Brolin Låftman et al., 2020). The first variable related to Internet activities, the recoded category called 'Yes' groups 'Every day or almost every day', '3 to 5 times a week' and '1 to 2 times a week' and the second one called 'No' groups 'With lower frequency' and "Never. The second variable related to emotions, the first category called 'Yes' groups 'Often' and 'Sometimes' and the second called 'No' groups 'Rarely' and 'Never'. With this recoding, that aim has been to identify young people who are more likely to be vulnerable.

Univariate and bivariate descriptive and inferential statistical techniques have been applied, such as the chi-square test, including calculation of the odds ratio (OR) for 2×2tables, CHAID (Chi Square Automatic Interaction Detector) analysis and the Mann-Whitney U-test, as well as multivariate factorial correspondence analysis to describe the relationships found between the socio-demographic factors under analysis and the observed variables.

The data obtained were analysed with the statistical package SPSS version 25.0 (IBM Corp., 2017).

Results

This section analyses the results obtained in order to measure gender differences and other socio-demographic factors related to the use of social media by young people living in Spain. For this purpose, the following observable variables were used as variables of their habits: frequency of use and daily exposure time on social media and the Internet.

Frequency of internet and social media use

First of all, the possible existence of statistically significant differences in the frequency of social media use according to gender has been tested. As can be seen in Figure 1, for both genders, approximately 8 out of 10 young people report using social media every day or almost every day. However, the inferential analysis reveals the existence of a statistical association (χ^2 (3) = 12.737, p = 0.005), with females using social media on a daily basis (89.3%), while males are more likely to use social media 3 to 5 times a week (11.3%). This is despite the high percentage of males who state their frequency of use as every day or almost every day (85%, below the percentage for the total of 87.1%. These are the only two cases in which the frequencies observed are higher than expected under the assumption of independence and present statistically significant differences.

A statistical association has also been found with regard to age and usage frequency (Table 2). The biggest differences are observed when recoding age into three age brackets: aged up to 26, aged 27 to 28 and aged 29 and older. Being of an age between 27 and 28 and using social media every day or almost every day (95.5% compared with an average percentage for the total of 86.9%) and being older than 28 and using social media 3 to 5 times a week (11.7%) are associated with this frequency.

The inferential analysis also reveals a relationship between social class and the frequency with which young people use social media (χ^2 (12) = 42.652, p = 0.000). Belonging to the upper-middle class is associated with using social media more frequently, 90.9% do so every day or almost every day, which seems quite logical given their higher purchasing power, which will translate into better speed and data tariffs. Young people belonging to the lower-middle class display a statistically significant lower frequency of participation in social media than those belonging to the lower-middle class (4.4%), while those belonging to the lower social class (7.9%) use social media less frequently than the other social groups.

Statistically significant differences with respect to educational levels are also observed. Young people in secondary education use social media less frequently, selecting the option of 3 to 5 times a week (15.8% compared with an average percentage of 9%), 1 to 2 times a week (4.2%), or sporadically (5.4%), while university students participate every day or almost every day (89.2% compared with an average percentage of 86.9%), possibly due to less parental control and more financial resources.

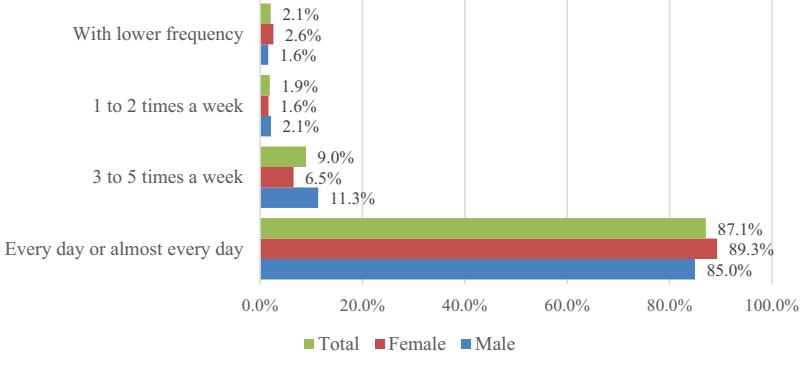

Figure 1. Relationship between frequency of Internet/social media use and gender.

Table 2. Association between gender and other socio-demographic factors and frequency of social media and Internet use.

		How often do you use the Internet and social media?					
Sociodemographic factors	n	Every or almost every day (*n*=1304) % row	3 to 5 times a week (*n*=135) % row	1 or 2 times a week (*n*=28) % row	Less frequently (*n*=34) % row	Statistical Chi-Square	Sig. p value
Age recoded							
Up to 26	691	87.6%	7.8%	1.8%	2.8%	17.926	0.006**
27 to 28	165	95.5%	3.5%	0.5%	0.5%		
Over 28	645	84.0%	11.7%	2.2%	2.1%		
Social Class							
Upper Class	287	86.5%	10.7%	1.5%	1.4%	41.652	0.000**
Upper Middle Class	410	90.9%	7.1%	1.2%	0.7%		
Middle Class	510	87.8%	8.9%	1.6%	1.8%		
Lower Middle Class	191	81.6%	8.9%	4.4%	5.0%		
Lower	101	77.5%	12.5%	2.2%	7.9%		
Level of Studies							
Primary Education (Up to 14)	116	74.6%	15.8%	4.2%	5.4%	23.470	0.001**
Secondary Education (Up to 18)	415	85.0%	11.2%	2.0%	1.8%		
University Studies	968	89.2%	7.2%	1.5%	2.1%		
Total	1500	86.9%	9.0%	1.9%	2.2%		

*$p < 0.05$; **$p < 0.01$ statistically significant.

Daily usage time of young people on social media sites

As with the frequency of social media use, women spend more time per day using social media, with statistically significant differences (χ^2 (4) = 21.108, $p = 0.000$), with observed frequencies that are higher than expected under the hypothesis of no association between the two variables. Thus, spending over 4 hours is found to be associated with being female (56.1%) and being male is associated with spending 1 hour or less (61.8%) (Figure 2). After 4 hours of daily use, the trend is reversed for both sexes.

With regard to age, the largest differences in behaviour occur when age is recoded into three age brackets: the subgroup of young people aged up to 26, who spend more than four hours a day, stand out with statistically significant differences (37.0%, well above the average percentage of the total sample with this usage time of 30.5%), as well as the group aged 27 to 28, with a high usage time of 4 hours a day. Young people aged 29 years old spend 1 hour or less (15.5%) and therefore have a lower daily usage time that differentiates them from the rest. For the rest of the groups, the differences observed are not statistically significant (Table 3).

In addition to women and younger people spending more time per day using social media, there are also differences in terms of place of residence. The figure for 'at home with their parents' is not surprising bearing in mind the current employment conditions that prevent young people leaving the family home (36.5% in this situation, above the average percentage of 30.5%) (Table 3).

Activities carried out in the online environment

In relation to the question on young people's participation in activities that may pose a risk in the online environment, approximately 9 out of 10 young people report shopping online (96.4%) and playing video games via a console or other device (88.2%), followed by 74.3% who play eGames. However, although these activities are less frequent than the others, more than half of young people report participating in betting (56.5%) and gambling (53.4%) (Figure 3).

A statistical association with gender is found in all socio-demographic characteristics related to the activities carried out by young people online. Men participate to a greater extent with statistically significant differences in video games (95.3% of men, OR = 4.66), betting (65.9%, OR = 2.19), eGames

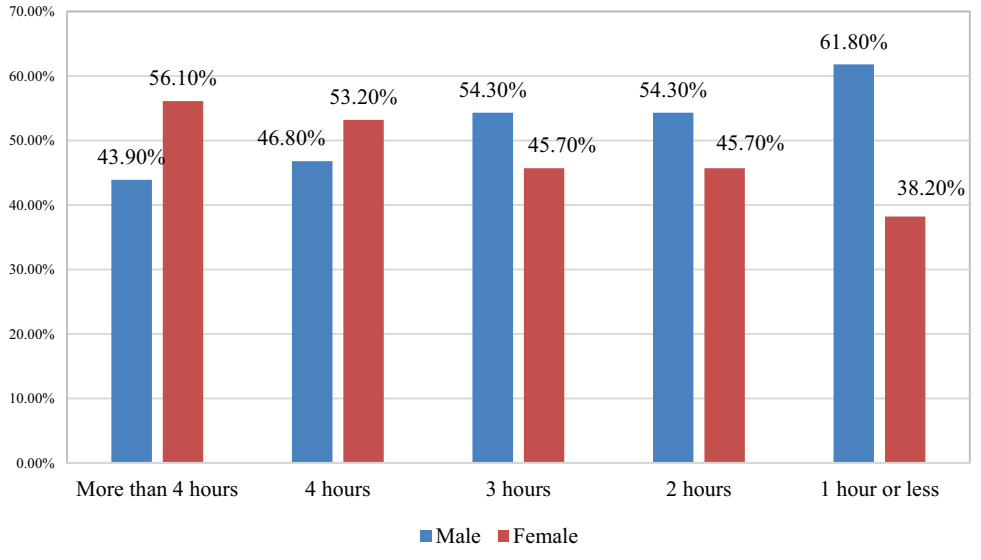

Figure 2. Relationship between young people's daily use of social media and gender.

Table 3. Association between the other socio-demographic factors and daily time spent on social media.

		How much time do you spend on social media per day?						
Sociodemographic factors	n	More than 4 hours (*n*=453) % row	4 hours (*n*=249) % row	3 hours (*n*=308) % row	2 hours (*n* =309) % row	1 hour or less (*n* = 168) % row	Statistical Chi-Square	Sig. p value
Age recoded								
Up to 26	691	37.0%	16.7%	21.1%	17.4%	7.8%	65.762	0.000**
27 to 28	165	27.3%	24.6%	16.5%	26.8%	4.8%		
Over 28	645	24.2%	14.8%	21.5%	22.9%	16.6%		
Place of residence								
Parents´ home	543	36.5%	15.9%	18.6%	18.4%	10.6%	26.989	0.042*
In a rented flat	433	28.1%	19.3%	19.9%	20.9%	11.8%		
In their own flat	420	25.1%	16.1%	23.1%	23.9%	11.8%		
In a rented flat shared with friends or strangers	78	32.4%	11.1%	28.9%	21.5%	6.2%		
Other	25	24.8%	18.0%	16.2%	17.2%	23.7%		
Total	1500	30.5%	16.7%	20.7%	20.8%	11.3%		

*p < 0.05; **p < 0.01 statistically significant.

(84.5%, OR = 3.08) and gambling (61.5% of men, OR = 1.91). Almost all young women shop online (98%, OR = 0.36; the inverse is calculated in order to facilitate interpretation of the odds ratio corresponding to women vs. men of 2.17) (Table 4).

Inferential analysis also shows a statistical relationship between the level of education and participation in betting and online shopping for the segment of young people with a university education (58.7% and 97.5%, respectively) and is close to being significant for young people who participate in gambling with the same level of education (55%). Social class is also revealed as a factor related to all the activities analysed in which young people participate online. This is specifically the case with the upper and upper-middle class group, with much higher frequencies observed than those expected under the hypothesis of independence (Table 4). In turn, there is a statistical relationship between belonging to the lower class or lower-middle class and not participating in these activities.

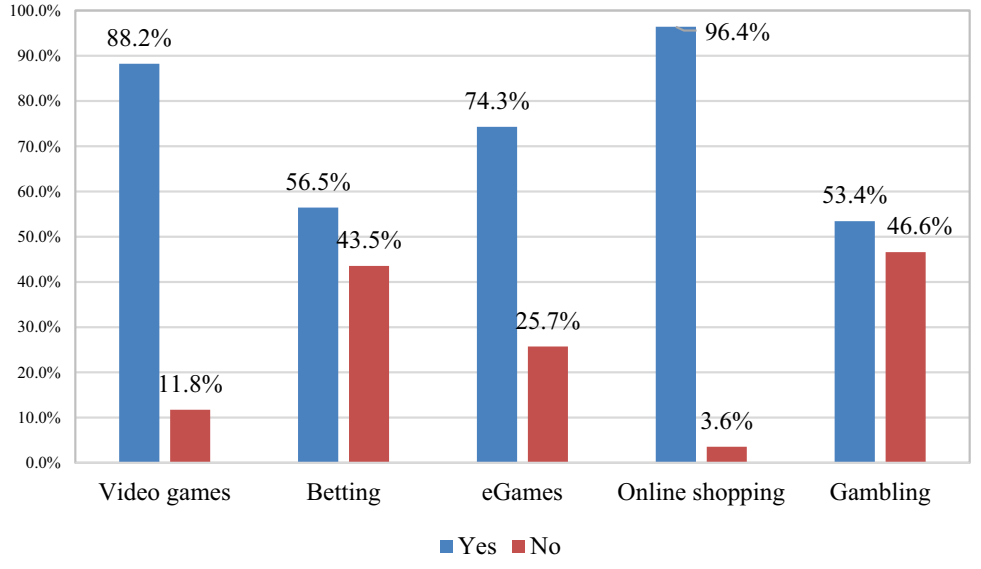

Figure 3. Activities carried out in the online environment.

Table 4. Relationship between the activities carried out in the online environment by young people and their socio-demographic characteristics.

Socio-demographic characteristics	n	Participate in Videogames Yes (*n*=1324) % row	Participate in Betting Yes (*n*= 847) % row	Participate in egames Yes (*n*=1114) % row	Participate in Online Shopping Yes (*n*=1446) % row	Participate in Gambling Yes (*n*=801) % row
Gender						
Male	760	95.3%	65.9%	84.5%	95.0%	61.5%
Female	740	81.1%	46.8%	63.8%	98.0%	45.3%
Chi-Square		72.143	55.292	83.679	10.758	38.850
p value		0.000**	0.000**	0,000**	0.001**	0.000**
Level of Studies						
Primary Education (Up to 14)	691	85.3%	62.9%	75.6%	89.7%	57.8%
Secondary Education (Up to 18)	165	88.1%	49.4%	75.3%	95.8%	48.5%
University Studies	645	88.6%	58.7%	73.7%	97.5%	55.0%
Chi-Square		1.085	12.411	0.549	19.343	5.809
p value		0.581	0.002**	0.760	0.000**	0.055
Social Class recoded						
Upper-Middle Upper Class	697	90.4%	65.3%	78.5%	98.1%	62.7%
Middle Class	510	87.7%	50.3%	74.4%	97.1%	47.2%
Lower-Lower Middle Class	292	84.1%	46.1%	63.9%	91.1%	42.0%
Chi-Square		8.519	42.673	22.564	30.367	47.193
p value		0.014*	0.000**	0.000**	0.000**	0.000**
Total	1500	88.2%	56.5%	74.3%	96.4%	53.4%

*p < 0.05; **p < 0.01 statistically significant.

As far as age is concerned, the segments that most differentiate young people's participation in video games (χ^2 (1) = 4.018, p = 0.045) and eGames (χ^2 (1) = 8.947, p = 0.003) is the group of individuals aged up to 26 in one group and those aged 26 and older in the other. There is an association between these activities and belonging to the youngest age group: 90.1% participate in video games (OR = 1.38) compared with an average of 88.2% of the total and 77.9% do so in eGames (OR = 1.43) compared with an average of 74.3%.

There are also significant differences in behaviour in online shopping (χ^2 (2) = 22.786; p = 0.000), in this case grouping age into three age brackets: young people up to 22 years of age, a group

characterized by a higher percentage of respondents who do not make purchases (7% compared with the total average of 3.5%), a group aged 23 to 29, where practically all members participate in this activity (98.8%) and the group aged 30 and over, who behave like the average profile (Table 4).

Finally, there is also evidence of an association between age and betting activities (χ^2 (2) = 31.240, p = 0.000) and online gambling (χ^2 (2) = 17.343, p = 0.000), with the largest differences in these behaviours being observed when three age groups are distinguished. In both cases, belonging to the 30+ age group is found to be associated with both activities (63% for betting and 58.2% for gambling in the digital environment). There is also an association between not participating and being younger: up to the age of 21 for participation in betting (56.5%) and for gambling a slightly lower age of up to 19 (61.8% compared with an average percentage of 46.6% of non-participation) (Table 5).

Table 5. Association between participation in betting and gambling and age groups.

		Participate in Betting				Participate in Gambling	
		Yes (*n*=847)	No (*n*=801)			Yes (*n*=801)	No (*n* =699)
Age	n	% row	% row	Age	n	% row	% row
Up to 21	131	43.5%	56.5%	Up to 19	309	38.2%	61.8%
22 to 29	815	57.0%	43.0%	20 to 29	637	53.9%	47.3%
Over 29	554	63.0%	37.0%	Over 29	554	58.2%	41.9%
Total	1500	56.5%	43.5%	Total	1500	53.4%	46.6%
Chi-Square, *p* value		31.240	0.000**	Chi-Square, *p* value		17.343	0.000**

**p < 0.01 statistically significant.

Table 6. Relationship between activities performed and negative emotions in the online environment for young people.

		Participate in Videogames		Participate in Betting		Participate in eGames		Participate in Online Shopping		Participate in Gambling	
		Yes (*n*=1324)		Yes (*n*= 847)		Yes (*n*=1114)		Yes (*n*=1446)		Yes (*n*=801)	
Emotions	n	% column	Chi-Square, *p* value	% column	Chi-Square, *p* value	% column	Chi-Square, *p* value	% column	Chi-Square, *p* value	% column	Chi-Square, *p* value
Fear											
Yes	442	30.4%	0.717	34.8%	21.066	33.1%	19.496	30.4%	3.003	36.7%	36.074
No	1030	69.6%	0.397	65.2%	0.000**	66.9%	0.000**	69.6%	0.083	63.3%	0.000**
Anxiety											
Yes	559	38.1%	0.221	41.5%	10.712	39.3%	3.394	38.4%	4.747	43.7%	24.351
No	915	61.9%	0.638	58.5%	0.001**	60.7%	0.065	61.6%	0.029*	56.3%	0.000**
Lack of respect											
Yes	670	46.3%	3.376	48.1%	5.297	47.7%	8.948	46.0%	5.831	50.6%	17.937
No	805	53.7%	0.066	51.9%	0.021*	52.3%	0.003**	54.0%	0.016*	49.4%	0.000**
Insecurity											
Yes	659	44.4%	1.159	45.3%	0.082	46.4%	3.921	45.6%	8.471	47.5%	4.641
No	808	55.6%	0.282	54.7%	0.775	53.6%	0.048*	54.4%	0.004*	52.5%	0.031*
Helplessness											
Yes	723	48.8%	1.035	50.8%	1.870	49.6%	0.169	50.2%	15.928	52.0%	5.137
No	744	51.2%	0.309	49.2%	0.171	50.4%	0.681	49.8%	0.000**	48.0%	0.023*
Feeling empty											
Yes	604	41.1%	0.095	43.1%	2.599	43.7%	10.648	41.9%	7.999	45.3%	11.135
No	860	58.9%	0.757	56.9%	0.107	56.3%	0.001**	58.1%	0.000**	54.7%	0.001**
Social pressure											
Yes	667	44.9%	0.058	48.2%	7.659	46.3%	2.685	45.8%	9.283	49.8%	15.457
No	814	55.1%	0.810	51.8%	0.006**	53.7%	0.101	54.2%	0.002**	50.2%	0.000*
Loss of control of information											
Yes	662	46.0%	3.426	47.3%	3.633	46.8%	5.044	45.5%	1.892	49.4%	12.450
No	806	54.0%	0.064	52.7%	0.057	53.2%	0.025*	54.5%	0.169	50.6%	0.000**
Shame											
Yes	567	38.8%	0.564	41.9%	9.403	41.3%	13.812	38.8%	1.563	42.8%	13.256
No	905	61.2%	0.453	58.1%	0.002**	58.7%	0.000**	61.2%	0.211	57.2%	0.000**

*p < 0.05; **p < 0.01 statistically significant.

Emotions in the digital environment

The questionnaire also included a question about upsetting emotions experienced by young people in the online environment (Figure 4). The analysis of the results reveals that for the sample of young people who report having felt negative emotions, approximately 4 out of 10 young state that they have felt most of the emotions studied. Moreover, with statistically significant differences, these emotions are associated with being female. In particular, 53.5% of women report feeling helplessness (χ^2 (1) = 9.475, p = 0.002; OR = 1.38), 51.7% say they feel insecure (χ^2 (1) = 26.285, p = 0.000; OR = 1.72), following by 51% who say they feel social pressure (χ^2 (1) = 20.803, p = 0.000; OR = 1.61), 44.9% say they feel empty (χ^2 (1) = 7.656; p = 0.006; OR = 1.34) and 43.4% suffer from anxiety (χ^2 (1) = 18.282; p = 0.000; OR = 1.58). Feelings of lack of respect, shame and fear are very similar between both genders and are similar to the average profile; the feeling of lack of control of information is much higher in women (47.4%); although the differences between the observed frequencies and the expected frequencies under independence are high, although not significant.

The analysis of the relationship between age and the emotions shows that in practically every case and in a descriptive manner, it is the youngest people who most experience these negative emotions, with an average age below the general average of 26.91. There are significant differences in the emotions of insecurity, with a mean age of 26.49 (Mann-Whitney U-test = 716.08 p-value = 0.012) and shame, with a mean age of 26.25 (Mann-Whitney U-test = 237606.5 and p-value = 0.000). (Figure 5).

Finally, we also sought to investigate which emotions exhibited by young people are more common on the basis of their online activities and whether there is a statistical relationship (Table 6).

The main results of the emotions may be summarized as follows:

- There is no evidence of association of young people's participation in video games with the different emotions analysed.
- Young people's participation in betting is associated with feelings of fear (OR = 1.71), anxiety (OR = 1.43)), disrespect (OR = 1.27), social pressure (OR = 1.34) and shame (OR = 1.39).
- There is a statistical relationship between participating in eGames and feelings of fear (OR = 1.86), disrespect (OR = 1.43), insecurity (OR = 1.27), feeling empty (OR = 1.50), loss of control over information (OR = 1.31), and shame (OR = 1.60).

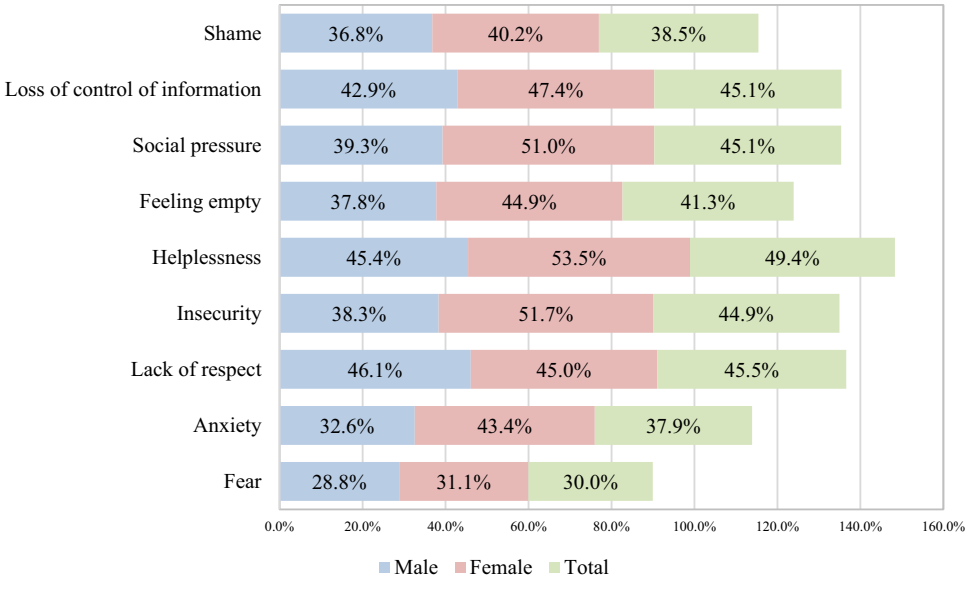

Figure 4. Distribution of emotions in young people's online environment according to gender.

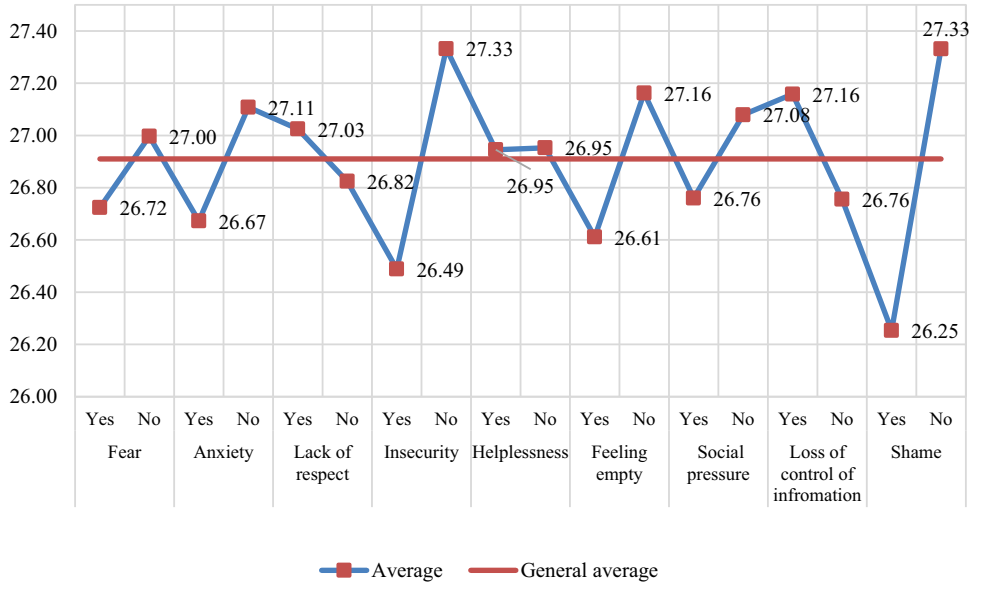

Figure 5. Distribution of emotions in young people's online environment according to age.

- The activity of online shopping is associated with feelings and emotions of anxiety (OR = 2.09), disrespect (OR = 2.13), insecurity (OR = 2.66), helplessness (OR = 4.03), emptiness (OR = 2.67) and social pressure (OR = 2.67).
- Finally, young people's participation in gambling is statistically related to the highest number of upsetting emotions: fear (OR = 2.01), anxiety (OR = 1.71), lack of respect (OR = 1.56), insecurity (OR = 1.25), helplessness (OR = 1.26), feeling empty (OR = 1.42), social pressure (OR = 1.51), loss of control of information (OR = 1.45) and shame (OR = 1.48), i.e. with all negative emotions.

In addition to the above analysis, we have examined the risk perception of those activities that reflect statistically significant upsetting emotions when misused. For this purpose, the categories of 1 and 2 points have been grouped into a classification indicating the absence of risk perception, while the others have been grouped together to indicate the presence of risk perception (as it has been explained above). It can be seen that young people's perception of risk, from lowest to highest risk, is in regards to eGaming (58%), followed by betting (71.6%), gambling (71%) and, lastly, the perception of the danger of compulsive shopping (73.8%). In other words, in the activities in which most young people participate, such as online shopping (96.4%) and eGames (74.3%), the percentage of young people who perceive danger is lower than the percentage who participate, perhaps because they are more common activities; while the opposite is true for the less common activities such as betting (56.5% participation) and gambling (53.4%), where danger is perceived by a higher percentage of young people, and they are even considered dangerous for a significant proportion of those who say they do not participate in them.

While analysing the possible existence of gender differences in risk perception, a statistical relationship (χ^2 (4) = 16.349; $p = 0.003$) using the original coding (score 1 to 5 points) was found for eGames. Boys perceive quite a lot of risk significantly (21.4% compared with 19% of the total with this rating), while girls perceive it only regularly (30.6% compared with 27.5% of the total). Gender is also found to be related to the perception of risk in betting (χ^2 (4) = 16.681; $p = 0.006$) in that young men perceive quite a lot of risk (29.6% with this assessment above the average percentage of the total of 26.4%) while young women do not perceive any risk (18.9% compared with an average of 16%). Finally, for gambling, the results are in line with those of the prior activity (χ^2 (1) = 5.062; $p =$ 0.024), with females more likely to not perceive any risk (17.3% compared with an average of 15.2%

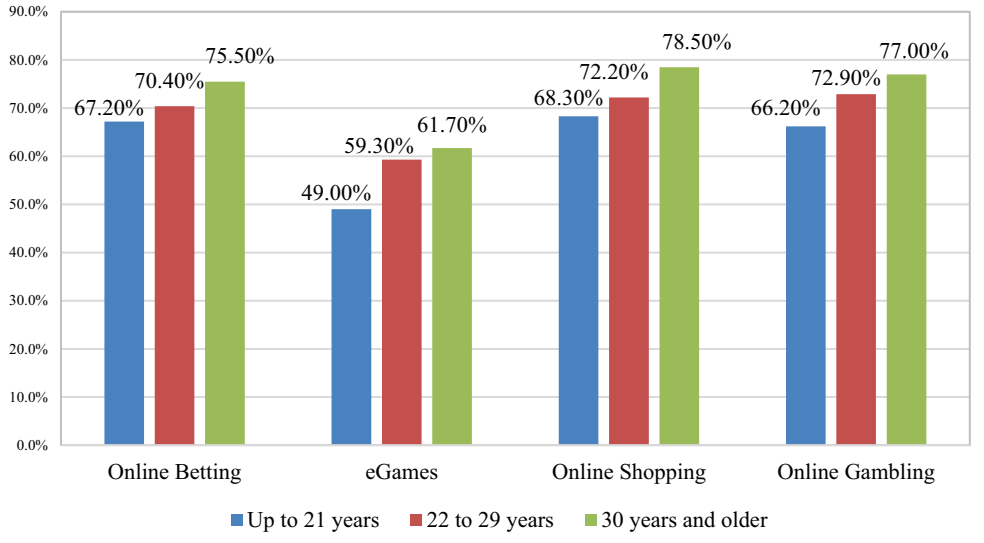

Figure 6. Perception of risk in activities by age of young people.

of the total). This could stem from their lack of experience in these activities. Males are more likely to perceive risk (OR = 1.37) (adding scores 2, 3, 4, and 5 points in the same modality) with a figure of 86.9% compared with the total average of 84.8%.

The statistical association with respect to age is observed by recoding the variable into three age groups: aged up to 21, aged 22 to 29 and aged 30 and older. The youngest (18–21 year olds) are the most vulnerable, perceiving significantly less risk or danger from the online activities analysed than those aged over 29 (Figure 6). It is therefore corroborated that in all cases it is the highest age group that is most aware of the dangers in the online environment: betting (χ^2 (2) = 7.334; $p = 0.023$), eGames (χ^2 (2) = 13.282; $p = 0.001$), online shopping (χ^2 (2) = 11.841; $p = 0.003$) and gambling (χ^2 (2) = 11.243; $p = 0.003$).

Representation of the relationships between internet and social media behaviour, online activities and emotions, and socio-demographic factors

In order to complete and simplify the above analyses, a correspondence analysis has been applied, allowing two factors to be obtained that explain 92% of the total variance contained in the data. This analysis, given its complexity and the high number of interactions between the categories, has been presented visually in Figure 7, which provide a holistic overview of the relationship of digital risk behaviour activities of youth and their profiles.

Figure 7 illustrates the two dimensions: factor 1 differentiates the time of daily social media use, with categories of longer duration (4 hours, 4 hours or more) on the negative side, and sporadic or less frequent use on the positive side. Gender contributes to the formation of factor 2: men on the positive part of the axis and women on the negative part of the axis (corresponding to the 4th quadrant). With regard to the activities, they carry out the absence of participation in online shopping activities is determined in the positive part, while in the negative part, the absence of participation in video games is determined. While gender does not contribute to the formation of dimension 1, it has, however, been well represented by this dimension as an illustrative element, with both genders scoring high on both factors.

The first quadrant (upper right region) represents younger people up to 19 years of age with sporadic use of social media and usage time of 1 hour or less per day, belonging to the lower-

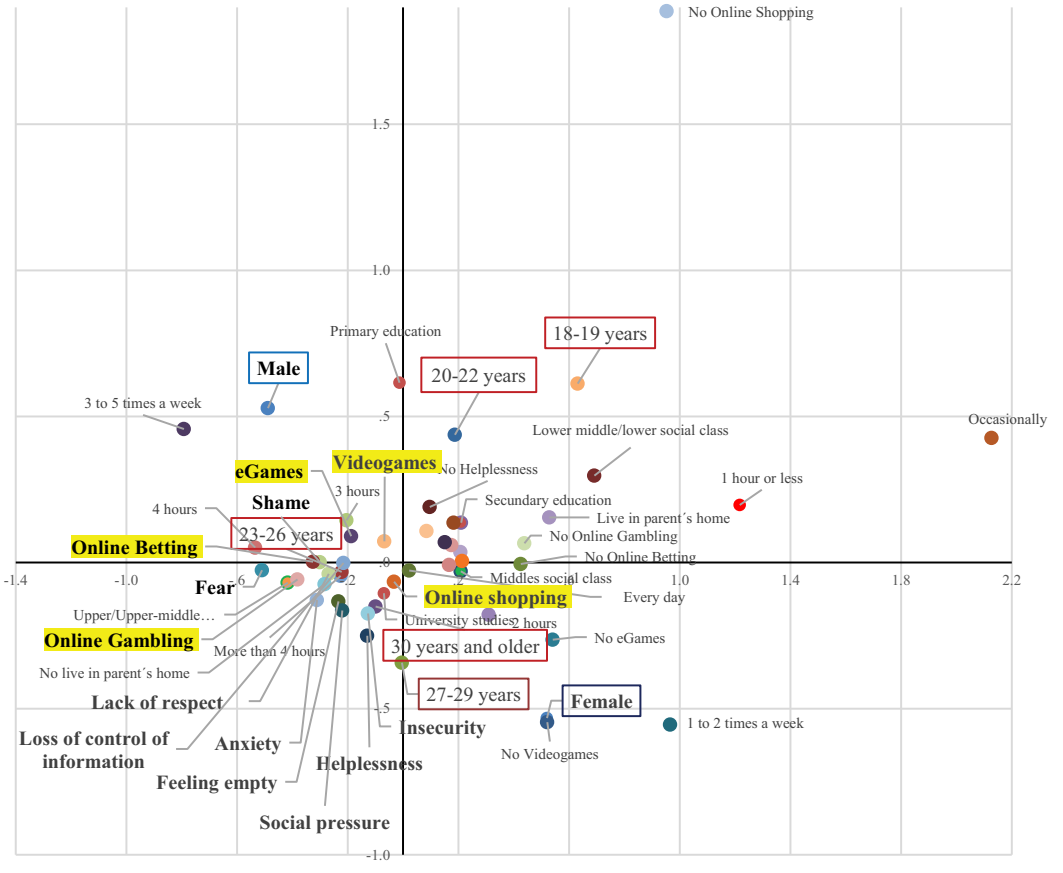

Figure 7. Map of the simultaneous relationships between the demographic characteristics of young people, usage habits, activities performed and emotions experienced in the online environment.

middle or lower classes, with primary and secondary education and living with their parents, who do not have or are not aware of experiencing negative emotions and do not participate in gambling or online gambling compared with the other groups, nor do they make online purchases. In the second quadrant (top left region) are men aged 20–22 and 23–26, who use social media 3 or 4 hours a day, 3 to 5 times a week and participate in video games and eGames. In the third quadrant (lower left region), we observe young people aged 30 and over who spend more than 4 hours a day using social media, do not live with their parents and participate in gambling and betting, which are activities, together with participation in eGames, that are related to awareness of practically all the negative emotions analysed: anxiety, insecurity, fear, lack of respect, shame, etc. Finally, in the fourth quadrant (bottom right region), the analysis has highlighted women who do not play video games or eGames and have a low frequency of use of social media. At the centre of gravity of the cloud, common to both genders, are 27–29 year old university graduates who shop online and use social media every day or almost every day.

Discussion

In light of the results obtained, it is possible to respond to the objectives set and confirm the research hypotheses formulated.

With regard to H1, it can be seen that young people's Internet use and habits are differentiated by gender and age. Both men and women have a very high frequency and daily use time, but the participation of women is higher than the average profile with statistically significant differences. With regard to daily use, it is observed that there is a higher percentage of women in the interval of 4 hours or more (6.4% and 12.2%) than in the interval of lowest use (less than 1 hour), where 23.6% more men can be found. In terms of daily frequency, both men and women are above 85%, with a slight increase in the case of women (89%). In relation to age, 37% of young people up to the age of 26 spend more than 4 hours a day on the Internet, which is 6.5 points above the average percentage of the sample. Finally, it can be seen that the young people with the highest frequency of participation in social media and the Internet per week have a higher social class profile and university studies, and those with the highest daily intensity are young people who continue to live with their parents.

This hypothesis (H1) is also confirmed with gender and age differences regarding the type of activities in which young people participate on the Internet. Video games and eGames are statistically related to the male gender (4.66 y 3.08 times more likely, respectively, than in females) and to being younger than 26 years old (in our study, 38% and 43% more likely, respectively, in this age bracket), as already found in other studies (Andreassen et al., 2016; Van Deursen et al., 2015). In addition, being male aged over 29 is found to be a factor associated with betting (2.19 times more likely) and gambling (91% more likely). In contrast, online shopping is more associated with the female gender (2.72 times more likely). This data confirms that there are certain risky activities in the online environment that are more related to one gender than the other (Rial et al., 2015), with the type of danger they face being different (Villanueva Blasco & Serrano Bernal, 2019).

Belonging to the upper and upper-middle social classes is also found to be a factor associated with betting and gambling. This idea is associated with the fact that young people with higher incomes can afford to engage in this activity in a more normalized way in their social environment. In this regard, Reith and Dobbie (2011) studied the importance of the social context in the initiation of the activity of betting and gambling and concluded that its initiation was associated, in many cases, with greater financial independence and with the development of new networks of work friendships.

Gender and age also differentiate young Spaniards' self-perception of risk linked to the activities analysed. Females do not perceive risk in activities in which they do not usually participate, such as betting and gambling, while men are more aware of them (37% more likely), and this perception is higher for the highest-age group, with those under 21 years of age being the most exposed. In turn, it has been confirmed that when young people participate regularly in an activity, they tend to lose their fear of it (Byrne et al., 2016). In general, boys tend to adopt a riskier online behaviour than girls, partly due to their constant search for new sensations, consequently exposing them more to dangers compared to girls (Piccardi et al., 2023).

The analysis of risk perception shows that the activities in which young people participate most frequently, such as online shopping and eGames, are those in which there are the greatest differences with respect to risk perception, which is at lower levels (16.3% and 23.4% differences, respectively). Young people may therefore be more vulnerable to these activities, as they are not vigilant and consequently do not develop mechanisms to control and protect themselves from the dangers involved. In contrast, in the stereotypically more problematic activities of betting and gambling, the differences lean towards a higher perception of risk versus participation (15.1% and 19.1% in favour of the former).

H2 is also verified, showing that the negative emotions experienced by young people in the digital environment are not the same according to gender. Females reported experiencing a higher percentage of almost all the emotions studied. The study shows the existence of emotions in which gender differences are much more striking and statistically significant in the case of females, such as having felt 'social pressure' (12% more than men and 61% more likely), 'insecurity' (difference of 13.4% and 72% more likely), 'anxiety' (10.8% and 58% more likely in females), 'helplessness' (8.1% difference between the genders and 38% more likely in females), or 'feeling empty' (7.1% and 34% more likely). It is possible that females' high intensity of use and exposure to social media may be related to having felt greater social

pressure and experienced more anxiety and insecurity, which are negative emotions that other authors have also identified in previous studies (Carvalho et al., 2018; De la Villa Moral & Suárez, 2016; Moreno et al., 2011; Twenge et al., 2018).

When we relate emotions and the activities that young people carry out in the online environment, we observe that H3 is confirmed. The more upsetting or negative emotions were found to be associated with activities of the highest possible risk, despite being of a recreational nature, such as betting or gambling. The fact that young people who participate in betting or gambling feel the emotions of fear and anxiety (in our study, 2.01 and 1.71 times more likely, respectively) is closely related to the nature of these activities (Reith & Dobbie, 2011).

Likewise, the statistical relationship between eGames and emotions such as fear, disrespect or insecurity (86%, 56% and 25% more likely, respectively) may be due to excessive and uncontrolled participation among young people (Kelly et al., 2021). Finally, online shopping is an activity associated with the emotions of helplessness, anxiety or social pressure (4,03, 2.09 and 2.67 times more likely, respectively), closely linked to the idea of compulsive and not sensible behaviour (Zheng et al., 2020). These results suggest that more studies should be conducted focused on the risk factors associated with the emotions that they generate with the aim of further analysing their impact on young people's daily lives, thus enabling preventive measures to be formulated.

Conclusion

One of the main contributions of the study is the idea that young people are feeling negative emotions when they participate online, and that these emotional patterns are different mainly based on gender, and other socio-demographic factors such as age, together with the type of online activity in which they participate.

This starting point has led to the conclusion that digital vulnerability is different depending on gender. Females are more exposed to online risks than males because they go online longer and more frequently than the latter. In addition, the main activities carried out are also marked by gender, with online shopping being more common among females, and e-Games, gambling and betting among males. This implies that the perception of the risks they face is different depending on the activity concerned.

Finally, the emotions felt also vary according to gender, with females being more sensitive to experiencing more negative emotions than males. In some of these emotions, the gender gap is much more marked, as in the case of social pressure, insecurity or anxiety, with a difference of more than 10 points between the two.

Study limitations and implications of the estudy

The study provides interesting theoretical implications by concluding that young people identify many negative emotions related to their online activities. Furthermore, the associations found between their usage habits, activities and emotions, together with other socio-demographic variables that explain their online participation, serve to identify differences in their digital experiences and in the negative feelings exhibited when surfing the net.

It would be of particular interest to continue working along these lines and to conduct qualitative studies on both the positive and negative emotions felt by young people, especially females, when they are carrying out a specific online activity.

After analysing the data, gender has emerged as a significant variable in this study; hence, it would be interesting to delve further into digital vulnerability among young people, encompassing alternative non-stereotypical classifications beyond the traditional male and female dichotomy. This would reflect gender identification using a more respectful measurement instrument that reflects the current social situation, beyond the gender binary.

In this regard, new studies could help to determine the emotional impact that these negative experiences have on young people in the online environment, helping them to seek tools for protection with regard to these risky activities and making them less vulnerable.

The idea of gendered patterns of vulnerability may have interesting practical implications for implementing media literacy projects tailored to young people according to their gender and age, assuming different online behaviour and emotional vulnerability. Furthermore, the study may mark an interesting avenue to work on formal and informal projects for the digital empowerment of children and young people, through self-identification of their emotional experiences whilst participating in social media and online activities of a different nature.

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Institutional review board statement

The study was conducted in accordance with the Declaration of Helsinki, the ICC/ESOMAR Code for the practice of Social and Market Research in Spain (https://iccwbo.org/publication/codigo-internacional-iccesomar-para-la-practica-de-la-investigacion-social-y-de-mercados/) and Norma ISO-20252.

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

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