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# Multidimensional Self-Concept and Its Association with Problematic Use of Video Games in Spanish College Students

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**Abstract:** Background: At present, new technologies provide numerous benefits in their correct use, while the need arises to study the consumption of some technologies, in this case, videogames, due to the negative consequences that they can cause in those subjects who have not yet consolidated their personality due to their excessive use. The study aimed to determine and establish associations between the dimensions of self-concept and the problematic use of videogames and their gender differences. Methods: A total of 525 university students participated in this study, representing 44.7% of the male gender and 55.3% of the female gender, with an average age of  $M = 20.80$   $SD = 3.12$  years old. The instruments used were the CESR and AF-5 questionnaires. Results: The results reveal the association ( $p \leq 0.05$ ) between the problematic use of videogames and the dimensions of self-concept, showing that students with severe or potential problems have lower levels of self-concept. In addition, it has been found that men have more problems associated with the use of video games than women. Men have a greater physical and emotional self-concept, while women have better social self-concept. Conclusions: This study highlights the inverse association between self-concept and problematic use of video games, a fact that shows the need to develop intervention programs aimed at improving self-concept and to reduce the problematic use of video games. Likewise, the levels of self-concept reveal that men have higher scores in the emotional and physical dimension, while women stand out in the social dimension.

**Keywords:** self-concept; video games; addictive behaviors; university

## 1. Introduction

The university stage is characterized by that period in which young adults begin their higher education with the goal of obtaining an academic degree that will allow them to enter the labor market [1]. In addition, when speaking of this stage, reference is made to the abandonment of the family environment, generating with it a substantial change in the student's life habits, where subjects are also molded and differences between peers are accentuated [2–4]. Among the most outstanding changes are food, greater freedom of leisure and free time, cognitive, psychological, social and physical stability that has been developed throughout adolescence which will be perfected until adulthood, so it is considered necessary to study those factors that may influence the quality of life of the student. Likewise, low levels of physical activity in the university population have turned on the alarms, mainly because of the little time devoted to it, causing an increase in the risk of suffering from diseases, which raises the promotion of healthy habits of physical life.

Along with the low levels of physical activity at this stage, the pathological use of screen devices aimed at digital leisure has gained much strength in the 21st century, especially among the youngest in the population. The use of screen devices has been increasing and spread among young adults, where these stages are characterized by a low level of social restrictions on these devices [5,6]. Among the best known are traditional videogames, which consist of a console, a wired or wireless controller and a screen, which means little mobility for the user [6]. Traditional videogames are known as a platform or interactive application that simulates various experiences, where the player, through a peripheral or controller interacts with the device, thus producing high levels of satisfaction and entertainment [7,8]. Research such as [9,10] have determined that the expansion of these platforms in all sectors has deepened more in those subjects under 30 years. In addition, it was specified that addiction to videogames takes place during adolescence, thus constituting a practice that will be repeated in adulthood [11–14].

Due to the increase in the use of this type of technology, several types of research have focused on the psychosocial effects produced by the abuse of this type of technology, finding that they can cause a series of benefits and damages to users, both at the cognitive, social, and behavioral level [15]. For instance, it has been found that the learning that occurs when playing a video game causes an improvement in attention, since it generates an increase in the activation of the brain at the prefrontal and frontal level, associating this to a shorter reaction time in tasks relating to search and visual attention, also improving the discrimination of shapes and colors and the tracking of multiple objects [16].

Although there are beneficial effects derived from the use of video games, abusive use of this type of technology can become an addiction [17]. The problem of addiction is compounded when it comes to online video games because there are types of games that have no end and are never interrupted. Thus, younger users are at risk of creating an addiction due to the fact that the user has the feeling that when they are not playing, their teammates and rivals of the game continue to progress while they do not [18–20].

Moreover, the problematic use of video games is usually associated with attention problems in younger users, which can be continue into adulthood if they do not work to solve these problems [21]. This is due to video games being very intense and stimulating, causing increased exposure to stress hormones, such as norepinephrine and cortisol [22]. In fact, some studies associate the use of this type of technology with the increase in young people suffering from attention and hyperactivity disorder [23,24]. The abusive use of technology is associated with worse academic performance [25], finding that regular video game users read 30% less and spend 34% less time doing their homework and studying than subjects who do not use this technology on a regular basis [26].

An association has also been found between the development of antisocial behaviors and the use of video games due to the fact that a large proportion of video games can be violent, which can cause tolerance to violence. Furthermore, it has been observed that there is a greater activation of the tonsil in subjects who play violent video games on a regular basis and less activity in the orbitofrontal areas of the brain, which is related to a decrease in the capacity for self-control and greater impulsivity [27,28]. In addition, the abusive use of video games can cause social isolation, both in relationships with your peer group and in family relationships, ultimately causing weak emotional relationships, in addition to strengthening social stereotypes of a racial or sexual nature. [29].

Following this line, several studies have shown how the excessive use of these devices can be associated with problems and negative consequences at the physiological level, hormonal changes, cognitive problems, states of depression, anxiety, socio-affective problems related to the loss of social skills [30–32]. It has even been determined that the problematic use of videogames is that the pathological use implies non-social behaviors, which harmfully affects the psychosocial level of the subject or player [9,33].

However, the use of video games is not only associated with negative consequences but can also be considered beneficial, such as with the reduction of overweight indices [8] or the improvement of social skills in the case of devices involving teamwork [9]. Even so, the positive effects are not only related to the healthy aspects but may also involve cognitive improvements. Baldia et al. [34] and

Chacón-Cuberos et al. [35] highlight their didactic potential since they contribute to the improvement of the health of the population, fine motor coordination, and the ability to solve problems. Pérez et al. [36] rely on the use of augmented reality-based video games to improve school violence and academic performance in adolescents.

One of the primary factors previously mentioned that can influence the quality of life of the university student is self-concept, a term pointed out as the construct that is formed by diverse elements and experiences of each one of the people [37]. Other authors consider this concept as a mental image, composed of diverse factors, of what the individual thinks of himself [38–40]. In turn, this construct is associated with the psychological well-being of the person. Not to be confused with self-esteem, for this reason, several authors show the difference between one and the other, relating the former with cognitive and descriptive elements of oneself (self-image), while the latter refers to evaluative and affective aspects [41].

Developing a review of the evolution of the term “self-concept”, a variety of existing definitions is appreciated. During the 1970s, Shavelson et al. [42] defined it as the “*perceptions of the individual about himself, which are based on his experiences with others and on the attributions that a subject makes of his own behavior*” or “*the perception that a person has of himself, that is formed from experiences and relationships with the environment, where both environmental reinforcements and significant others play an important role*”. For Rosemberg [43] it was defined as “*the totality of thoughts and feelings that refer to the self as an object*”. For his part, Wylie [44] emphasized the importance of “*personal cognitions and evaluations*”, while Harter [45] considers that the term self-concept refers to the “*perceptions that the individual has of himself*”.

Shavelson et al. [42] proposed the multidimensional model of hierarchical factors, indicating that the self-concept is made up of several hierarchically organized dimensions. Shavelson et al. [42] marks the line followed by most researchers today, understanding the general self-concept as the sum of several structured multidimensional perceptions [46]. The self-concept would be divided into academic and non-academic dimensions [42], with the non-academic subdivided into emotional, social, and physical [47]. This model is the basis of this research, understanding that people create a global self-assessment, and different specific self-assessments.

Although there are not many studies considering the relationship between self-concept and the problematic use of video games, the research done by Chacón et al. [48] on a sample of university students showed a negative association between the problematic use of videogames and social and academic self-concept, as well as a positive relationship between the physical dimension of self-concept and this addictive behavior. Moreover, the research conducted by Espejo et al. [49] found that users, who are more attracted to the use of video game use, have a higher academic and physical self-concept than users who show less attraction to such devices. On the other hand, the research conducted by Sánchez-Zafra et al. [50] with a sample of schoolchildren, showed that subjects who do not have problems with the use of video games have higher scores in the academic and social dimensions, while the subjects that present potential problems with the use of video games are what present the highest scores in the physical dimension.

Current research has found few studies that analyze the relationship between self-concept and the problematic use of video games and those that have there is little unanimity in the results. Therefore, it is proposed to analyze the possible association between these two variables to complement the existing literature, providing data on these associations in a sample of university students. Thus, the main objective of this study was analyzing the association between the five dimensions of self-concept (academic self-concept, social self-concept, emotional self-concept, family self-concept, and physical self-concept) and the use of videogames. The secondary objective was to understand the levels of self-concept and problematic use of videogames in a population of university students, checking if there are differences according to gender.

## 2. Materials and Methods

### 2.1. Participants

A total of 525 university students from the University of Almería, of both sexes ( $n = 247$ , 44.7% of men and  $n = 305$ , 55.3% of women), with an age range between 18 and 44 years old ( $M = 20.80$  years;  $SD = 3.12$  years) and enrolled in the degree of primary education teaching, participated in this research. The selection of the sample was carried out by means of convenience sampling, using as an inclusion criterion, the degree of primary education at the University of Almería. It should be pointed out that of the initial sample, made up of a total of 583 students, a total of 58 questionnaires were discarded because they were poorly completed.

### 2.2. Variables and Instruments

In this research, the following variables and instruments were used as a reference:

- Sex, collected through an ad-hoc questionnaire, categorized as male or female.
- Self-concept, is collected from the original questionnaire “Autoconcepto Forma-5 (AF-5)” from García and Musitu [51], and measures the dimensions of academic self-concept (AS), social self-concept (SS), emotional self-concept (ES), family self-concept (FS), and physical self-concept (PS). This test consists of 30 questions, which are valued with a Likert scale of five options, where 1 is Never and 5 is Always; for each dimension the sum of the following items is established (AS: items 1, 6, 11, 16, 21, 26; SS: items 2, 7, 12, 17, 22, 27; ES: items 3, 8, 13, 18, 23, 28; FS: items 4, 9, 14, 19, 24, 29; PS: items 5, 10, 15, 20, 25, 30). In the study of [51], a reliability of  $\alpha = 0.810$  was determined, a value similar to that detected in the present investigation (Cronbach’s alpha of  $\alpha = 0.86$ ); by dimensions (AA:  $\alpha = 0.86$ ; AS:  $\alpha = 0.80$ ; AE:  $\alpha = 0.70$ ; AFM:  $\alpha = 0.79$ ; AF:  $\alpha = 0.76$ ), values in all groups were satisfactory as were those found in the investigations of Estévez et al. [52] and Cava et al. [53].
- Problematic use of videogames is collected from the original instrument “Questionnaire of Experiences related to Videogames (CESR)” [9], which has been validated in a sample of Spanish adolescents. The CESR questionnaire is made up of 17 items formulated in a negative sense, valued using a Likert scale of 4 options (1 = Never; 2 = Sometimes; 3 = Quite a few times; 4 = Always). A summation of the items is established to describe the behavior of the user in relation to the use of videogames, establishing a classification in terciles to categorize the variable in: “No problems”, “Potential problems” and “Serious problems”. The reliability of the original instrument [9], was from  $\alpha = 0.87$ , while in the present study  $\alpha = 0.92$  has been obtained.

### 2.3. Procedure

From the Faculty of Education of University of Almería, the collaboration of the groups of the degree of Master in Primary Education of the University of Almería was requested, selected from the sample previously mentioned; for this purpose, the subjects were informed about the nature of the investigation and their collaboration was requested; they were also given a model of authorization asking for their informed consent, guaranteeing at all times the anonymity of their information. The researchers were present during the collection of the data where they did not detect any abnormality to be reported. The study complied with the ethical standards of the 1975 Research Committee and the Declaration of Helsinki.

### 2.4. Data Analysis

For the analysis of the data, IBM SPSS 23.0 statistical software was used. The basic descriptions were analyzed through frequencies and means. On the other hand, the differences between categorical variables were determined through contingency tables. Likewise, the differences between variables

of categorical and interval type were analyzed using ANOVA and Student's *t*-test. Likewise, the Bonferroni test has been applied to verify inter-group differences.

### 3. Results

Regarding the analysis of the data and observing the descriptions shown in Table 1, the 525 university students presented similar proportions by gender, the majority (70.7%;  $n = 390$ ) had no problems with the use of videogames, while 22.3% ( $n = 123$ ) had potential problems, and only the remaining 7.1% ( $n = 39$ ) presented severe problems regarding the use of videogames.

**Table 1.** Descriptive analysis of the variables.

<b>Sex</b>	Men	44.7% ( $n = 247$ )	
	Woman	55.3% ( $n = 305$ )	
<b>Video games</b>	Without problems	70.7% ( $n = 390$ )	
	Potential problems	22.3% ( $n = 123$ )	
	Serious problems	7.1% ( $n = 39$ )	
		<b>M</b>	<b>SD</b>
<b>Self-concept</b>	Academic	3.61	0.58
	Social	4.04	0.61
	Family	3.24	0.80
	Physical	4.24	0.66
	Emotional	3.53	0.76

With respect to self-concept (AF-5), the most valued dimension was physical self-concept ( $M = 4.24$ ;  $SD = 0.66$ ), followed by the social dimension ( $M = 4.04$ ;  $SD = 0.61$ ) and the academic dimension ( $M = 3.61$ ;  $SD = 0.58$ ), while the dimensions worst valued by university students were the emotional dimension ( $M = 3.53$ ;  $SD = 0.76$ ) and the family dimension ( $M = 3.24$ ;  $SD = 0.80$ ).

When the problematic use of videogames was analyzed according to the sex of the participants in the study (Table 2), statistically significant differences were detected ( $p \leq 0.05$ ). These differences are motivated because most of the women do not have problems with the use of videogames (86.5%;  $n = 264$ ) and only 1.0% ( $n = 3$ ) of them have severe problems, while in men the situation changes, finding that 14.6% ( $n = 36$ ) of them have severe problems and 34.4% ( $n = 85$ ) potential problems. It is proven that men have more problems with the use of videogames than women.

**Table 2.** Problematic use of videogames according to sex.

	<b>Sex</b>		<b>Sig.</b>	
	<b>Men</b>	<b>Woman</b>		
<b>Videogames</b>	Without problems	51.0% ( $n = 126$ )	86.5% ( $n = 264$ )	0.000
	Potential problems	34.4% ( $n = 85$ )	12.5% ( $n = 38$ )	
	Serious problems	14.6% ( $n = 36$ )	1.0% ( $n = 3$ )	

When relating self-concept according to the sex of university students (Table 3), statistical association has been found ( $p \leq 0.05$ ) in the social, physical, and emotional dimensions, finding that men obtain higher scores than women in the physical ( $\sigma M = 3.85$ ;  $\varphi M = 3.26$ ) and emotional dimensions ( $\sigma M = 3.52$ ;  $\varphi M = 3.00$ ), while this situation is inverted in the case of the social dimension, with women obtaining higher figures than men ( $\sigma M = 4.17$ ;  $\varphi M = 4.94$ ).

**Table 3.** Self-concept dimensions according to sex.

	Sex				Levene's Test		Test T Sig. (Bilateral)
	Men		Woman		F	Sig.	
	M	SD	M	SD			
<b>Academic</b>	3.61	0.45	3.62	0.67	31.404	0.000	0.851
<b>Social</b>	4.17	0.50	4.94	0.67	25.789	0.000	0.000
<b>Family</b>	4.45	0.60	4.40	0.70	0.249	0.083	0.339
<b>Physical</b>	3.85	0.69	3.26	0.71	3.017	0.658	0.000
<b>Emotional</b>	3.52	0.73	3.00	0.78	0.196	0.618	0.000

Regarding the analysis of the problematic use of videogames in terms of the five dimensions of self-concept, the data showed a statistically significant relationship in all cases ( $p \leq 0.05$ ), as shown in Table 4. These differences are motivated because university students who do not have problems with the use of videogames are those who have the highest values of self-concept in the five dimensions, followed by those who have potential problems, and students who have severe problems are those who have the worst self-concept. University students analyzed who had no problems or who only presented potential problems with the use of video games have higher scores than those with severe problems. From these data it can be inferred that there is an inverse relationship between the problematic use of videogames and the self-concept of university students.

**Table 4.** Relationship between self-concept and problematic use of videogames.

	Videogames						F	Sig.
	Without Problems		Potential Problems		Serious Problems			
	M	SD	M	SD	M	SD		
<b>Academic</b>	3.73 *	0.60	3.61 *	0.50	3.29	0.51	8.342	0.000
<b>Social</b>	4.07 *	0.63	4.02 *	0.55	3.80	0.59	3.411	0.034
<b>Family</b>	4.53 *	0.67	4.45 *	0.49	3.82	0.73	13.838	0.000
<b>Physical</b>	3.68 *	0.90	3.60 *	0.76	3.49	0.74	4.516	0.026
<b>Emotional</b>	3.33 *	0.75	3.22	0.84	3.20	0.55	3.705	0.032

Note: \* = Differences with Serious problems.

#### 4. Discussion

Based on the results given in this study, a comparison will be made with different data provided by other authors, in order to support this study. Regarding the problematic use of videogames, we found that seven out of ten students do not have problems with the use of these platforms, with only 22% expressing potential problems and the remaining 7% severe problems regarding their use, data that coincide with the studies of [54,55].

On the other hand, with regard to self-concept, the results of this research reflect that the dimension with the highest score is that of the physical dimension, this being the one most highly valued by the students, followed by the social and academic dimensions, with the emotional and family dimensions being the least valued. These results are similar with those found in the study done by Sánchez-Zafra et al. [50], finding that the most valued dimensions have been physical and social, while the worst value has been the emotional self-concept. In the case of the research of Sánchez-Zafra et al. [50], the family dimension has not been the worst valued because this research has been carried out with schoolchildren, while in the present investigation the family dimension was worse valued because the study sample was university students. Thus, young adults usually live outside the family home, having

fewer family relationships due to distancing that occurs when leaving the family nucleus. In the case of the research done by Espejo et al. [49], it was found that the most valued dimension of self-concept was the family dimension for adolescents. In fact, Salum-Fares et al. [56] indicated that the self-concept that should present a higher assessment is the family as it is the most basic social organization.

This may be due to the fact that the physical appearance of students significantly influences the formation of the general self-concept, much more than the rest of the sub-dimensions. Various studies show the positive relationship between physical self-concept and psychological well-being on a personal and social level [57,58].

Considering the results obtained on the problem of videogames as a function of the sex of the participants, it should be noted that problematic use seems to be a phenomenon mostly associated with the male gender; this is observed in this study and in other studies such as [59–61]. Likewise, previous studies such as those of [9,62] showed that males were more likely than females to be frequent users and online gamblers, which can lead to greater addiction [63].

With respect to the data provided by the relational study, it was obtained in relation to the problematic use of videogames according to sex, that eight out of ten women do not present problems when using this type of digital leisure. Only 1% of the female sample show severe problems, in comparison to the men who had a higher level, where a third of the male cases showed potential problems and 14% of them, severe problems. Studies such as [64] try to explain this by pointing out that the reason why women play less than men, and therefore their problematic use is more limited, is because these games have been designed for males by trying to respond to their desires and affinities. In female students, due to the platforms they usually use (Wii, tablet, and smartphone, especially), the competitive aspect is less and causes computer game use to be more sporadic, which is in line with the results of [60]. Authors such as [65,66], showed the relationship between problematic use and the number of hours of use (either the number of hours played in total or interrupted consumption), which explained why females were less vulnerable than males. Likewise, our data coincide with that of [67], in which women habitually used these videogames in half of the cases, as opposed to men who played nine out of ten times.

Finally, the association between the problematic use of videogames and the five dimensions of self-concept has also been analyzed. University students who do not have problems associated with the use of video games have higher scores in all dimensions of the self-concept than subjects with severe problems. The results found partially agree with those found by Sánchez-Zafra et al. [50] who observed how users who do not have problems with video game usage are the ones with the highest scores in the academic and social dimensions. In the research conducted by Espejo et al. [49], it was shown that the subjects less assiduous to the use of videogames are those that have the greatest academic self-concept, while the most frequent users of videogames are those that have a lower academic self-concept. The data obtained in the present research can be explained because the subjects who do not have problems with the use of video games have a better general self-concept because they spent less time with these devices and they can dedicate it to academic aspects, spending time with their group of equals and the practice physical activity, so they will improve these dimensions of self-concept [34]. Excessive use of this type of digital leisure can lead to low levels of self-esteem or confidence and poor academic performance [68]. In addition, the literature corroborates that students who make excessive use of videogames show poor social skills and interpersonal relationships, inferences in activities, and cognitive problems that may require specific psychological assistance [40,69].

The main limitation of the study is that it would have more ideal to have made a longitudinal study with access to a larger sample. This limitation means that the results are associations between the dimensions of self-concept and the problematic use of videogames. In addition, the sample could have been extended to the national context to make it representative, and as such, future research should focus on extending the study throughout the Spanish context.

## 5. Conclusions

As main conclusions, it has been possible to determine that 7 out of 10 university students do not present problems related to the use of videogames, while very few show severe problems. Similarly, it was found that females make less use of these devices than males. Regarding the general levels of self-concept, this study concludes that the lowest level in university students is the family level, while the social and physical levels are the dimensions that have obtained the highest score.

On the other hand, differences in gender indicate that men have a greater tendency of problematic use of videogames than women, showing higher percentages in their use in both potential and severe problems. In the same way, the self-concept levels of the students according to gender show how the men present better scores in the physical and emotional dimension, while women obtain a higher score in the social dimension, for other categories the figures are similar.

Finally, students with problems with the use of videogames show low levels of self-concept. In this sense, self-concept in young people can act as a risk factor with excessive and abusive use of videogames.

**Author Contributions:** M.C.-S., M.R.-J., F.Z.-O. and R.C.-C. conceived the hypothesis of this study. M.C.-S., M.R.-J., F.Z.-O. and R.C.-C. participated in data collection. M.C.-S., M.R.-J. and R.C.-C. analysed the data. All authors contributed to data interpretation of statistical analysis. M.C.-S., M.R.-J., F.Z.-O. and R.C.-C. wrote the paper with significant input from M.C.-S. All authors read and approved the final manuscript.

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