Playing Computer Games and Playing Sports in the Light of Personal Background Variables

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Abstract: The eighties of the last century, saw significant an acceleration in the development and improvement of computer games. In this study, the sports habits of the people sampled, were examined, to see whether these habits are related to their attitudes towards video game use. The extent to which time spent playing active sports, affects the amount of time spent playing video games, was also analyzed. During all three hypothesis tests, it was, therefore, possible to establish, that based on personal background variables, differences can be observed, regarding sports habits and time spent playing video games. At the same time, the time spent on video games, does not come at the expense of playing sports. Those who play more video games do not do less sport, neither in terms of gender, age group or even place of residence.

Keywords: sports; computer games; personal background variables

1 Introduction

The eighties of the last century saw significant acceleration in the development and improvement of computer games. This development has now grown into an industry we call eSports. In addition to institutionalized e-sports, where there are teams, fans, sponsors, a large number of international competitions and live broadcasts, there is of course another type of video gaming that primarily meets individual needs [7]. The de-regulation of the broadcasting sector has decisively determined the development and popularization of online video games [17], while eSport found an

ally in streaming [4]. In addition to existing social media networks and video sharing platforms, streaming platforms, such as Twitch, also started to appear.

The worldwide coronavirus pandemic significantly reduced the attendance of traditional eSports events; however, the popularity of online games remained unbroken. These facts are well supported by the sales statistics of the hardware (primarily video cards) required for online games [14].

It is important to highlight that communities built around an online game create a real subculture, which is different from the mainstream. It is characterized by two essential things: verbal expression and ritual elements of subculture [7]. The unique language associated with each game is primarily related to the environment/world where the game takes place, but it also has its own abbreviations for situations, tactics and strategy, and various commands.

In the case of online games, we can define a number of different genres, the most popular of which are Multiplayer Online Battle Arena, First Person Shooter and Real Time Strategy. In general, it can be said that communication, cooperation, creativity, teamwork and choosing the right strategy appear in each genre. This is because each player has their own role within the team, which they consciously develop, while they also try to get into a situation where they can give as much as possible to the team, as well as to the development of their own character.

"The physical element and social function of sport which have come to the forefront in case law and academic debates are relevant to the question of eSport's status as a sport" [2] [18].

It is not difficult to observe the same terminology appearing in eSports and traditional sports, such as player, tactic, team, strategy, game, match, offense, defense, practice, skill, and others that are frequently in use. Moreover, "competitive video gamers start to demonstrate the same athletic properties as traditional sports athletes" [4].

When it comes to computer games, people's first association is passive and relaxing activity, which greatly contributes to the fact that eSports are recognized as a real sport. Contrary to popular opinion, there is evidence that eSports athletes exhibit signs that could be considered physical exertion [8]. In [1] Aadahl, Kjaer and Jorgensen state that "absolute intensity may also be expressed as a multiple of an individual's basal metabolic rate (MET=metabolic equivalent)".

Although the players do not perform any spectacular movements while playing online games, the movements of the fingers on the mouse and keyboard are significant. Nowadays, everyone can use online tools to test how many mouse clicks they can do in a minute or a second. In the case of computer games, this process does not consist only of clicking, but is aimed at carrying out real actions and commands, so the mechanical functions are complemented by cognitive functions as well. The unit for measuring this skill is called Actions Per Minute (APM). For example, a prepared player performs around 400 APM, while the highest ever

measured is 818, which is more than 13 commands issued in a second, using a keyboard and mouse. Pimenta [10] points out that the whole process is asymmetric, since players use both hands (keyboard + mouse) which means that different parts of the brain are active. These values are several times what can be measured among average people, but they are also higher than the values of elite athletes. For example, these values are higher than those of professional table tennis players, who have the highest values for hand-eye coordination.

The German Sports University tests the levels of the hormone, cortisol produced in the players' bodies, and has found that the amount of cortisol produced is roughly the same as that of a race car driver. In addition, the players' heart rate is often 160-180, which is the same as the heart rate measured in marathon runners. Considering these empirical data, it cannot be said that the body of e-athletes is not exposed to the same effects as traditional athletes [11] [12].

We are witnessing the transformation of a significant part of casual gaming into a serious industry characterized by prize money, sponsors, strict rules, teams, referees, live streams and huge arenas. Of course, this also has psychological effects, which are primarily experienced by eSports athletes.

Perhaps the most remarkable of these are the beneficial effects on health from a physiological point of view: taking part in sports improves the functioning of the heart and circulatory system (blood vessels become more flexible and the heart muscles become more stable), and the heart rate also decreases; the oxygen absorption capacity of the respiratory system increases; movement coordination improves; while sports also have a beneficial effect on the nervous system and the immune system; as well as helping to achieve and maintain an appropriate body weight, which are only some of the most important benefits [3] [5].

From a psychological perspective, the increase in self-awareness (for example, motivation, endurance and fighting ability) and self-confidence, the reduction of feelings of anxiety and tension, and the improvement of focus and concentration are worth highlighting. At the same time, it also helps in achieving emotional balance, improves the quality of sleep and general well-being, and results in a sense of joy and feelings of success [3] [5].

In terms of self-evaluation, it can be said that the athlete is able to at least partially utilize the experiences gained during sports in other areas of their life as well. Sports activities contribute to the development of the individual, the strengthening of their health, the development of their physical abilities and movement sets and patters, as well as to a meaningful and productive use of free time [16].

Mahoney believed that the role of sports in children's lives is significant in terms of their personality development, because the activities that build a child's competence are particularly critical in shaping their development, since children at a young age monitor their own performance and competence with increased focus [6] [13]. Research has established that physically active young people eat healthier

and smoke less, watch less TV, spend their free time more usefully, and their risk of becoming overweight also decreases. [8] [15].

It can be concluded that their well-being is also better, and an improved state of fitness and health can be seen during the various measurements, so sportsmanship can also be paralleled with a better quality of life. Those who play sports are also more satisfied with their lives and report fewer depressive symptoms. Attitudes towards values can also differ between children who play sports and those who do not: adolescents who regularly play sports prefer internal value orientation methods (e.g., self-acceptance, belonging to a group, sense of community, physical health), while young people with low activity levels value external value orientation methods. (e.g., financial success, good looks, reputation) [9] [12]. Some researchers have already started studies using humanoid robots to help students adopt healthy lifestyles [19] [20].

2 The Aim of the Research

Computer games and sports are both types of activity that involve different personal background variables, and individuals' preferences may vary depending on their individual preferences, interests, health and other factors. We define some key background variables that may affect the propensity to play computer games and sports. Examples include interests and preferences, time and flexibility, health, community and peer relationships, or goals and motivation.

In this study, the sports habits of the people in the sample were examined, to see whether these habits are related to their attitudes towards video game use. The extent to which time spent playing active sports affects the amount of time spent playing video games, was also analyzed.

During the data analysis, the gender, age and place of residence of the participants was also taken into account, examining whether a correlation can be demonstrated with regard to the personal background factors, as well as physical sports activities or habits related to video games.

2.1 Hypotheses

H1: The intensity of playing sports is inversely proportional to the frequency of time spent playing computer games.

H2: A distinction can be made in the sample on the basis of the individual background variables in terms of whether the examined persons choose active sports or video games as a free time activity.

H2/a: Women spend significantly more time playing active sports, compared to men, who prefer to spend more time on computer games.

H2/b: Among the younger age group, it is more common to spend their free time with online video games, in contrast to the older age group, who choose active sports more often.

H2/c: Being in a city provides more opportunities for sports, so people living in the city spend more time playing active sports, as opposed to people living in the countryside, who prefer to spend more time on computer games.

3 Method

The quantitative questionnaire survey received a total of N=485 evaluable responses. Simple random sampling was used to reach our target group using the snowball method.. The survey was conducted using a questionnaire method, and the questionnaires were published online. The questionnaire contained 14 questions, 3 of which related to the personal background information of the participants in the survey, examining the composition according to gender, age and place of residence.

Another 5 questions asked about sports habits, and 5 asked about habits related to video games and online games.

3.1 Sample of Research

A total of 485 people participated in the research. Gender: 46% of survey participants are male (N = 224) and 54% are female (N = 261). Age: The average age of the survey participants is 20 years old. Participants were divided into three groups based on their age (Table 1).

Table 1
Distribution of the age groups

	N	**%**
Younger than 14 years	154	32
15-20 years old	185	38
Older than 21 years	146	30
Total	**485**	**100**

Country: The vast majority of respondents, 98% (N = 475), are from Serbia. Another 2% (N = 10) live in Hungary. Residence: Regarding their municipality of origin, 62% (N = 300) of the sample come from cities and 38% (N = 185) are from villages.

4 Results

4.1 Correlations between Time Spent Playing Sports and Playing Online Video Games

82% of the sample (N=400) answered that they do sports regularly, with varying intensities. Only 18% of the sample (N=85) indicated that they do not partake in sports at all. Regarding the intensity of playing sports, the majority of the participants, 33% (N=160), enjoy sports on a daily basis for at least 1 hour. 28% (N=137) exercise for less than an hour per day, and 21% (N=103) exercise for more than 1 hour every day (Table 1).

Table 2
Frequency of doing sports

	N	**%**
Do no sports	85	18
Do sports less than 1 hour a day	137	28
Do sports 1 hour a day	160	33
Do sports more than 1 hour a day	103	21
Total	**485**	**100**

The time spent by the sample participants playing online or offline video games shows the following: the majority of the respondents, 39% (N=189), simply do not play online games. 14% of them (N=68) play monthly and 18% (N=88) play on a weekly basis. The remaining respondents, 29% of the sample (N=140), on the other hand, play online or offline video games on a daily basis (Table 2).

Table 3
Time spent playing video games

	N	**%**
Do not play video games	189	39
Plays on a monthly basis	68	14
Plays on a weekly basis	88	18
Plays on a daily basis	140	29
Total	**485**	**100**

Most of the participants in the study who play video games frequently (N=277), 45% (N=89) have been playing regularly for 1-5 years. 45% of the respondents (N=89) have been playing video games for less than a year, and 23% (N=63) have been playing for more than 5 years (Table 3).

Sports habits were also compared with the frequency of time spent playing video games (Table 4).

Table 4
How long have you been playing video games?

	N	%
Less than 1 year ago	89	32
1-5 years ago	125	45
More than 5 years ago	63	23
Total	**277**	**100**

The data show that, contrary to the initial assumption, a little over a half of the non-athletes, 52% (N=44), do not regularly play video games; while this proportion for athletes is 56% (N=41), which, on the other hand, is less than half for this group. The proportion of non-athletes who play daily is 26% (N=22), while for athletes this proportion is roughly the same, 24% (N=32).

Table 5 shows the amount of time spent playing video games by athletes and non-athletes. Out of the total sample, athletes accounted for N=137, which means that they play more than one hour of sport per day. The number of non-athletes was 263, who play less than one hour of sport per day.

Table 5
Time spent playing video games among athletes and non-athletes

	Athlete		Not an athlete	
	N	%		
Do not play	56	41	44	52
Plays on a monthly basis	24	17	7	8
Plays on a weekly basis	25	18	12	14
Plays on a daily basis	32	24	22	26
Total	**137**	**100**	**85**	**100**

Comparing the data, it can be observed that there is no difference between the data for athletes and non-athletes regarding the time spent on computer games (Fig. 1).

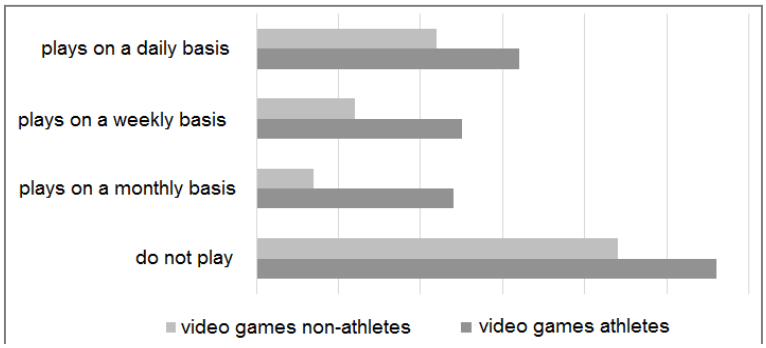

Figure 1
Time spent playing video games by athletes and non-athletes

An additional study was conducted, using a two-sample t-test, which also supported the above results, according to which, there is no significant difference between athletes and non-athlete in terms of time spent playing video games (t=1.29 p=0.02).

According to the statement formulated in the first hypothesis, the intensity of sports is inversely proportional to the frequency of time spent with computer games. The acquired results were compared using the Pearson's correlation test. The obtained values show that there is a correlation between the two variables, but they are directly proportional to each other, meaning that the frequency of playing sports increases or decreases with the frequency of time spent playing video games. At the same time, the value of the correlation coefficient is r=0.13 (p=0.003), which indicates a negligible relationship between the variables.

Based on the results obtained, in the case of H1, the statement included in the hypothesis is to be rejected.

4.2 Sports Habits and Video Gaming in The Light of Personal Background Variables

4.2.1 Gender Characteristics of Time Spent Playing Active Sports and Playing Video Games

In this study, the amount of time spent by men and women playing sports and using video games was compared, as well as the intensity of sports and the use of online video games. Based on the results, 64% of the men in the sample partake in sports for at least one hour a day, while 46% of women answered that they spend at least 1 hour a day doing sports activities (Table 6). The difference in the time spent on non-sports shows a significant difference based on the values of the two-sample t-test (t=4.81 p=0.001). The data supports the idea that men spend significantly more time doing sports than women. The obtained results alone, however, do not support the H2/a hypothesis.

Table 6

How much time do you spend doing sports? (by gender)

	Men		**Women**	
	N	**%**	**N**	**%**
Do not doing sports	31	13	54	21
Less than 1 hour per day	51	23	86	33
1 hour per day	71	32	89	34
More than 1 hour per day	71	32	32	12
Total	**224**	**100**	**261**	**100**

In terms of time spent using video games, a significantly lower proportion of women, 61%, do not play video games at all, compared to only 14% of men who do not play video games. Only 1% of women play more than one hour a day, and 13% of men belong to the same category (Table 7). Regarding the frequency of playing video games, there is a significant difference between men and women, also based on the results of the two-sample t-test (t=14.9 p=0.001). According to this, women spend significantly less time playing video games than men. This result, on the other hand, supports the statement contained in the H2/a hypothesis.

Table 7
How much time do you spend playing video games? (by gender)

	Men		**Women**	
	N	**%**	**N**	**%**
Do not play	31	14	158	61
Less than 1 hour per day	100	44	92	35
1 hour per day	64	29	7	3
More than 1 hour per day	29	13	4	1
Total	**224**	**100**	**261**	**100**

Examining the data from the perspective of age groups, the results indicate that non-athletes are more common among older age groups. A significantly higher proportion of those younger than 15, and the 15-20 age group take part in sports regularly, 1 or more hours a day, than those older than 21 (Table 8, Figure 2).

Table 8
Characteristics of the time spent doing sports and playing video games in terms of the examined age groups

	Under 15 years of Age		**Between 15-20 Years**		**Over 21 years of Age**	
	N	**%**	**N**	**%**	**N**	**%**
Do not play	21	13	32	17	32	22
Less than 1 hour per day	38	25	51	28	48	33
1 hour per day	57	37	52	28	51	35
More than 1 hour per day	38	25	50	27	15	10
Total	**154**	**100**	**185**	**100**	**146**	**100**

The obtained results were checked with a one-way ANOVA test, the values of which (F=6.47 p=0.002) show that the age group older than 21 years plays sports significantly less than the younger ones: [younger than 15 years; 15–20-year-olds] > [over 21 years old]. These results refute the H2/b hypothesis, which claims that the older age group spends more time on active sports.

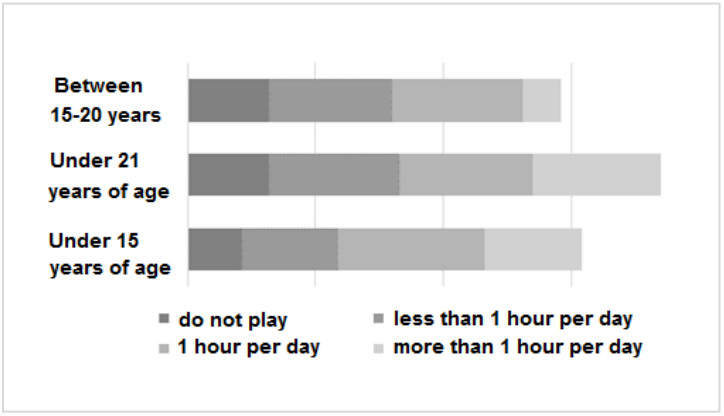

Figure 2
Sports habits by age group

Regarding the frequency of time spent with video games in each age group, the youngest age group appears to be the one who spends the most time playing games (Table 9). Those younger than 15 spend an average of 2.14 hours a day playing video games, those between 15 and 20 play 1.68 hours, and those over 20 play 1.11 hours a day. The obtained results are also supported by the one-way ANOVA test (F=14.64 p=0.001), based on the values of which, the following relationship can be determined in regards to time spent on video games: [under 15 years old]>[between 15-20 years old]> [Those over 21].

Table 9
How much time do you spend playing video games? (by age group)

	Under 15 years of age		**Between 15-20 years**		**Between 15-20 years**	
	N	**%**	**N**	**%**	**N**	**%**
Do not play	40	26	68	37	81	55
Less than 1 hour per day	74	48	76	41	42	29
1 hour per day	28	18	24	13	19	13
More than 1 hour per day	12	8	17	9	4	3
Total	**154**	**100**	**185**	**100**	**146**	**100**

The obtained results support a part of the statement contained in the H2/b hypothesis, according to which it is more common among the younger generation to spend their free time with online video games.

4.2.2 Characteristics of Time Spent Playing Active Sports and Playing Video Games in Terms of Place of Residence

The study examined whether participants living in the city or from villages do sports activities more often. The assumption was that there are more opportunities for sports in the cities, so the people living there spend most of their free time partaking in some kind of sports activity. Based on the data, 35% of the participants living in the city exercise for at least one hour a day, and 25% of them do so for more than one hour. Among the people living in villages, 30% of the respondents do sports for at least one hour a day, and 15% of them do so for several hours a day (Table 10). The differences were also supported by the two-sample t-test based on the two groups (t=3.28 p=0.001). This means that people living in cities spend significantly more time playing sports than people living in villages. This result confirms the statement contained in the H2/c hypothesis.

Table 10
How much time do you spend playing sports? (by place of residence)

	City		Village	
	N	**%**	**N**	**%**
Do not do sport	47	16	38	20
Less than 1 hour per day	73	24	64	35
1 hour per day	104	35	56	30
More than 1 hour per day	76	25	27	15
Total	**300**	**100**	**185**	**100**

In terms of time spent playing video games, 16% of city dwellers play at least one hour a day, and 7% play more than one hour. 42% play less than an hour a day, and 35% do not play at all. 12% of the people living in villages play for one hour a day, while 6% of them play more than one hour. 37% play less than one hour a day, and 45% do not play video games at all (Table 11). Looking at the average of the results obtained, city dwellers spend 1.8 hours a day playing video games, as opposed to village residents, who spend 1.4 hours a day playing video games. Based on the results of the two-sample t-test (t=2.42 p=0.01), this difference can be considered significant. These results refute a part of the hypothesis H2/c, according to which people living in villages spend more time on computer games.

Table 11
How much time do you spend playing video games? (by place of residence)

	Men		Women	
	N	**%**	**N**	**%**
Do not play	105	35	84	45
Less than 1 hour per day	125	42	67	37
1 hour per day	49	16	22	12
More than 1 hour per day	21	7	12	6
Total	**300**	**100**	**185**	**100**

Conclusions

The first hypothesis stated that the intensity of sports is inversely proportional to the frequency of time spent on computer games. The results do show a correlation between the two variables; however, it is a direct correlation instead, meaning that the frequency of playing sports increases or decreases with the frequency of time spent playing video games. Therefore, the obtained results do not support the statement contained in the H1 hypothesis.

Based on individual background variables, the sample was examined to see if the participants prefer sports or video games as free time activities.

Based on the results of the gender survey, it can be said that men spend significantly more time playing sports than women, which refutes the first half of the statement included in the H2/a hypothesis. At the same time, women actually spend significantly less time using video games than men, which confirms the other part of the hypothesis.

The tests carried out based on age groups also confirmed only the part of the H2/b hypothesis, according to which it is more common among the younger generation to spend their free time with online video games. Older people really do play less, but also do less sports activities than young people.

According to the study based on place of residence, people living in cities spend significantly more time playing sports than people living in villages. However, it is also those living in the city, who play video games more often.

During all three hypothesis tests, it was, therefore, possible to establish that based on personal background variables, differences can be observed regarding sports habits and time spent playing video games. At the same time, the time spent on video games, does not come at the expense of playing sports. Those who play more games do not play less sports, neither in terms of gender, age group or place of residence.

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