

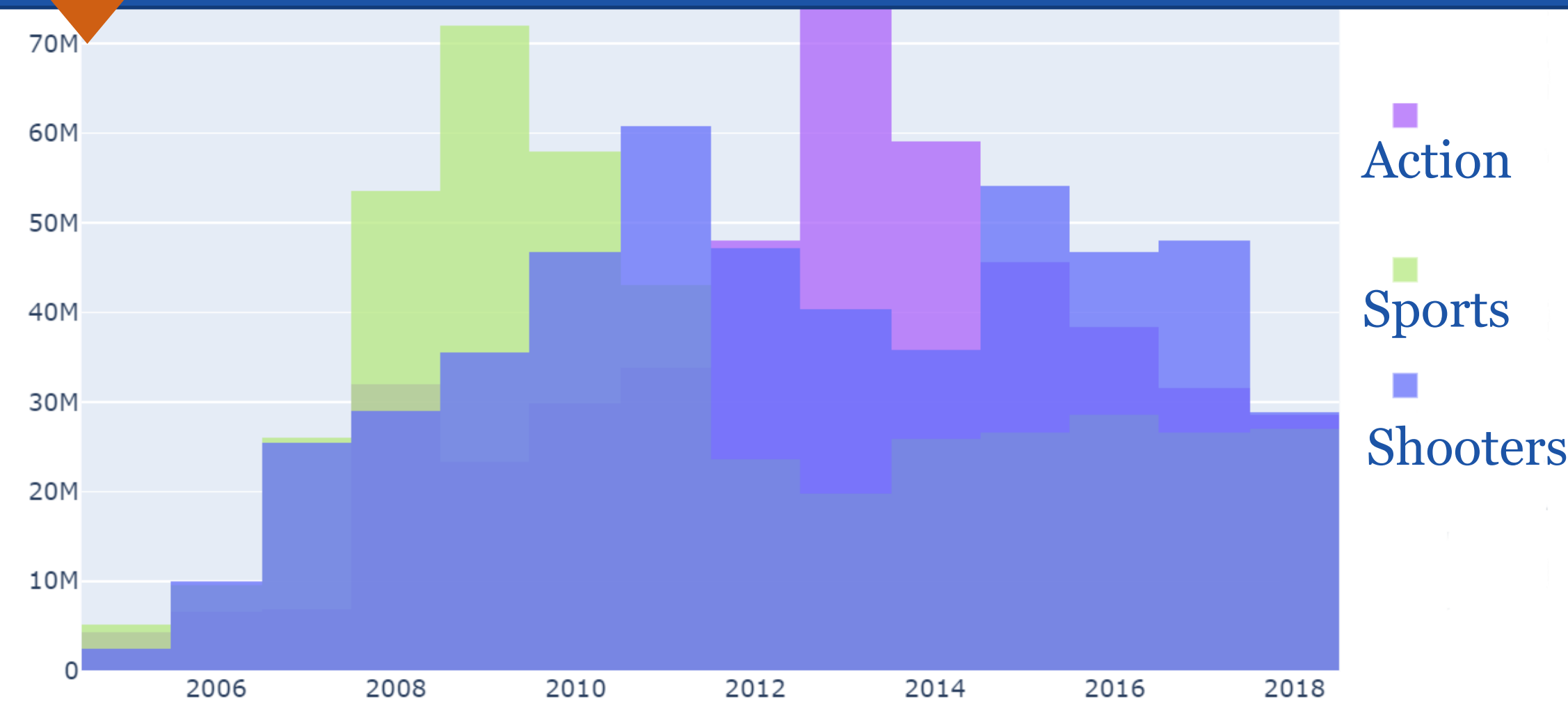
Do video games cause aggression and what is their impact at all?

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Introduction

1

This research aims to observe a correlation between school shootings and video games, and the impact of video games on those who play them. I don't know whether every point of my plan will be done since I'll use free access data, which provides not all info that is needed.



Methodology

2

The methodology implies the use of statistical tools for hypothesis testing and data processing approaches:
1st : Collect and rebuild data for further analysis
2nd: Analyze data about games sales, school shootings, impact of game industry on economy using chi-squared test and linear fit

Experiment Setup

3

The experiment setup involves:

- **Data** from the real world:
 - Number of games sold from 2005 to 2018 (includes game genre and region of the world where it was sold)
 - Data gathered surveying students in the high schools of the State of Connecticut anonymously
 - Number of a school shooting cases in the USA from 1970 to 2019 (specifies the number of killed and wounded persons)
 - Employment rate growth of different industries in the USA from 2013 to 2015
- Analyzing correlations

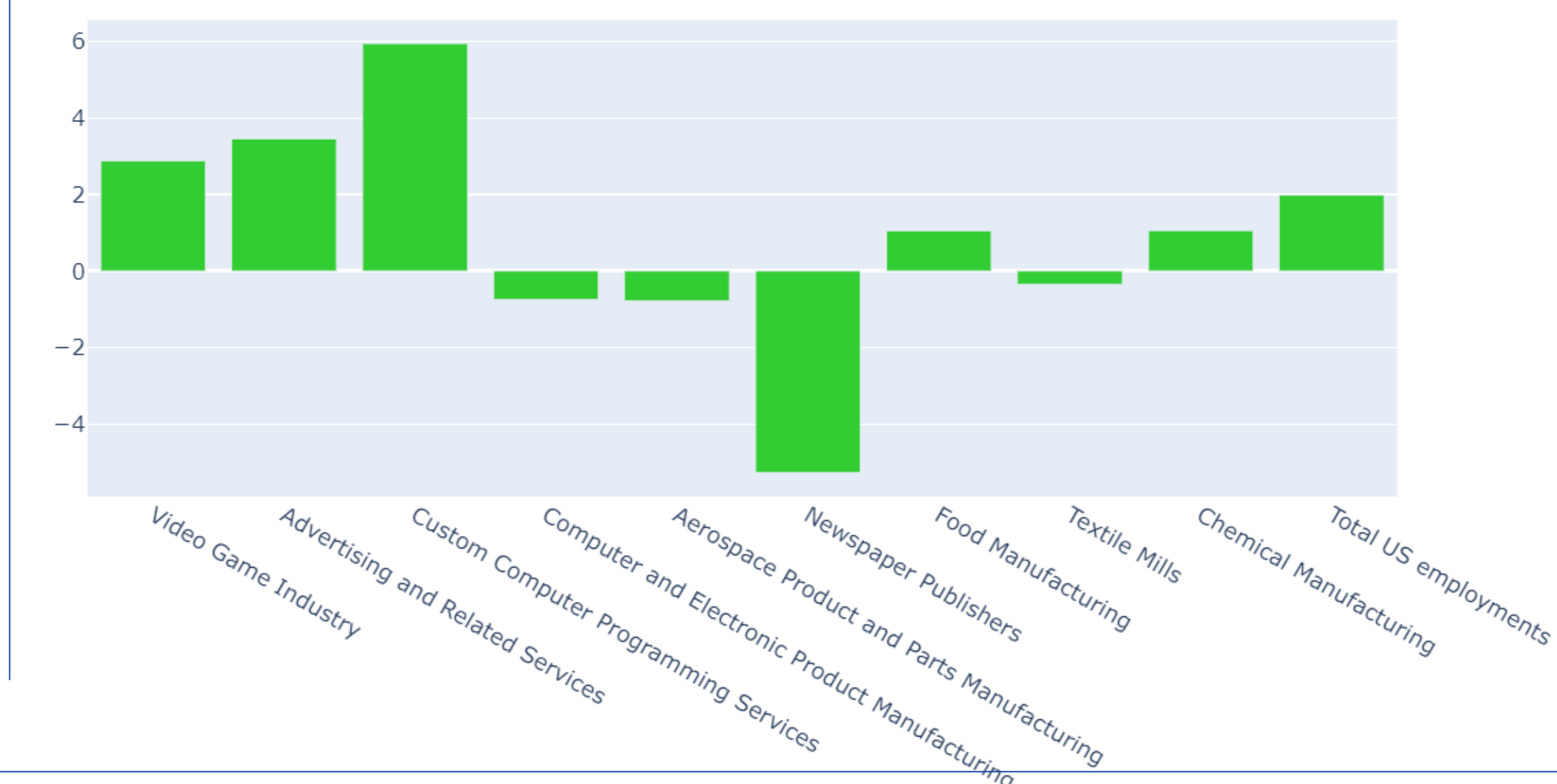
The **purpose** of the experiment is to determine what computer games affect on.

Following hypothesis was tested:

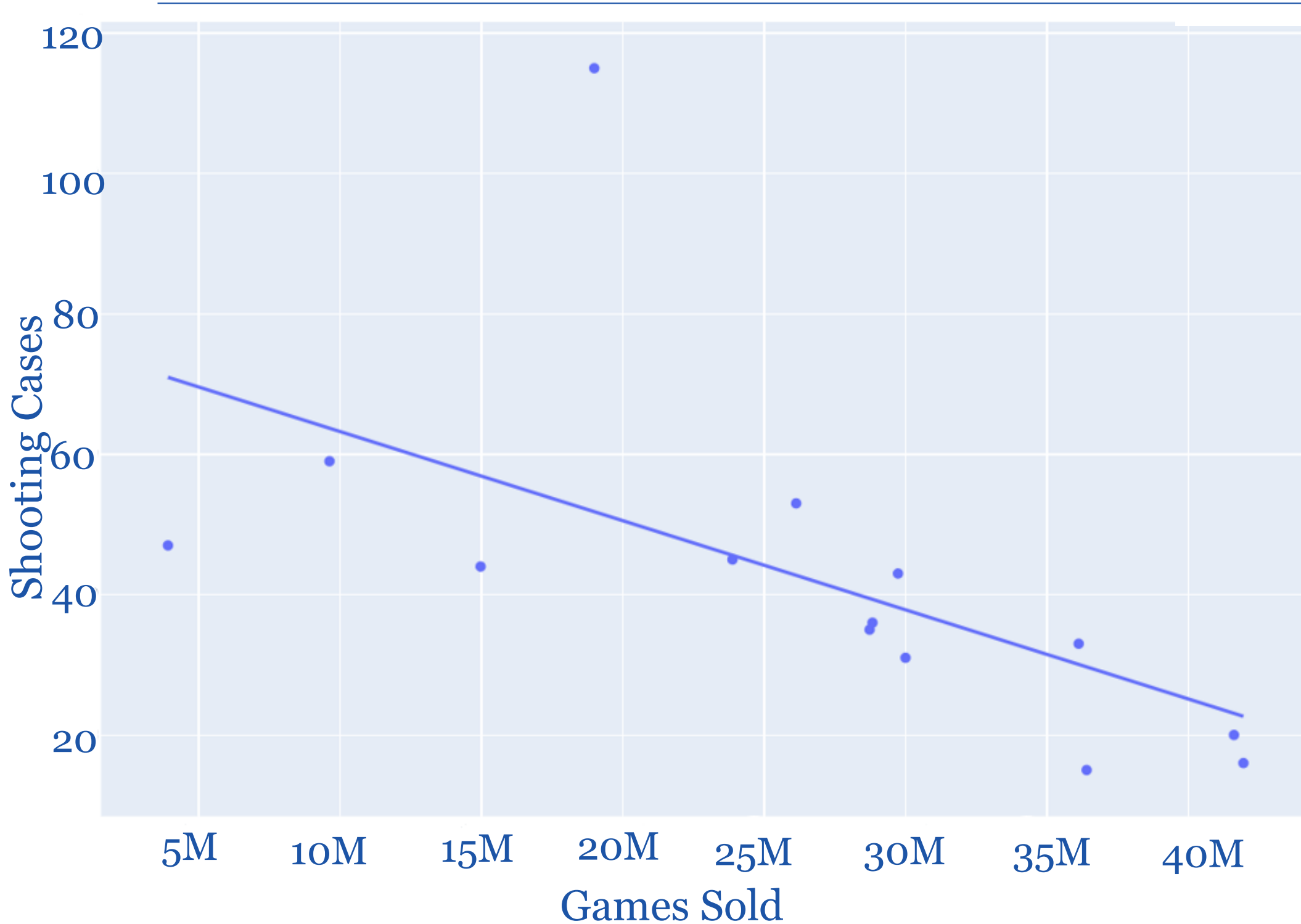
$H_0 : \mu_1 = \mu_2$, $H_1 : \mu_2 > \mu_1$ for specific aspect of student's life (for example, grades) for gamers and non-gamers.

Example of data gathered surveying students. Based on their answers about smoking experience we have:

Annual employment rate growth in %



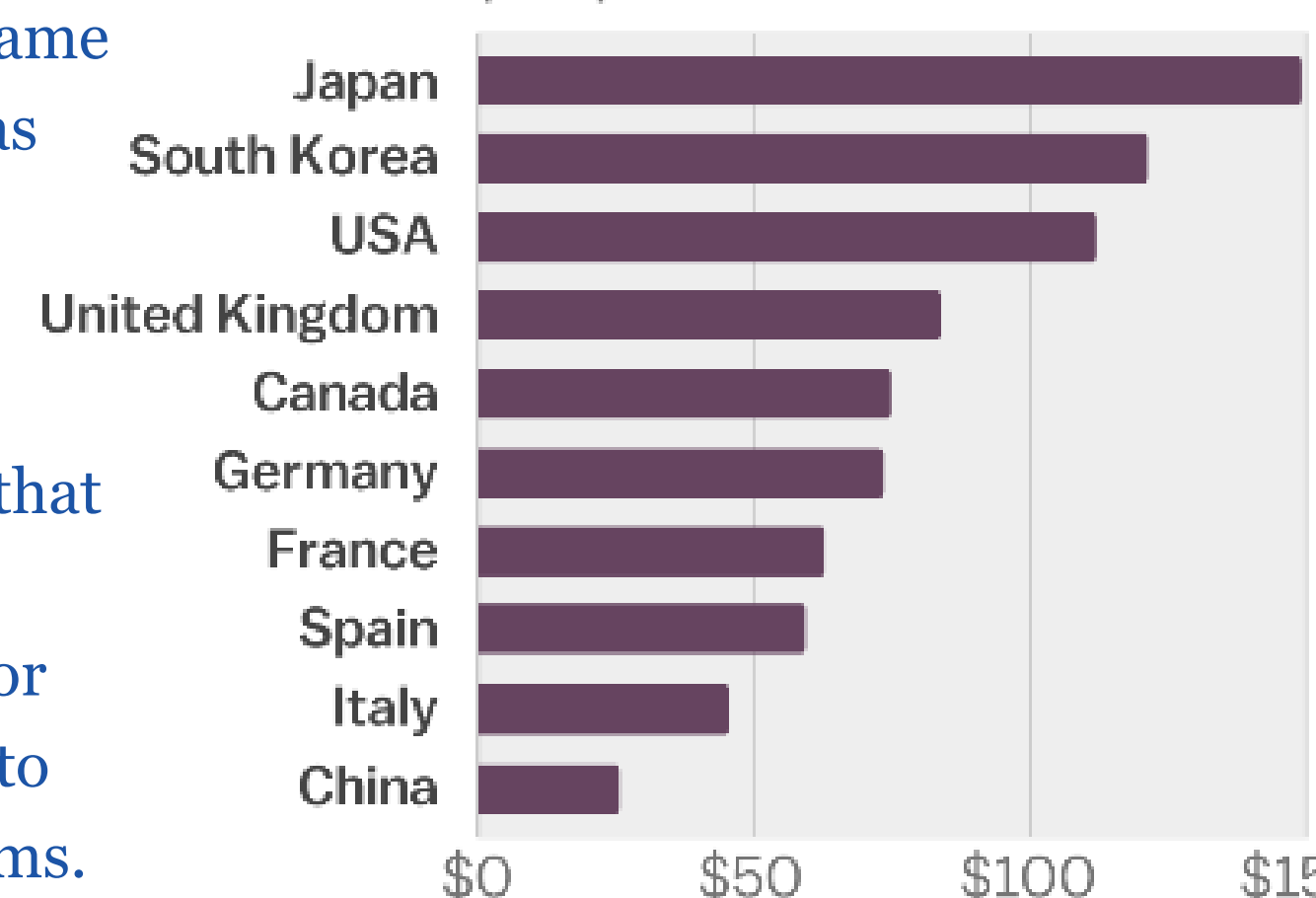
The game industry pays a **considerable tax** to the US national budget and gives a lot of **working places** for Americans. Comparing to the most popular industries in the USA, the game industry is one of the fastest-growing. Having this fact, we can suppose that games positively affect the welfare of citizens in general.
Unfortunately, I didn't found enough data to test this hypothesis.



From countries which give the biggest profit to the game industry, the only USA has such a problem with fun deaths (including school shootings). Very likely, the reason is that the USA is one of the two countries where permits or licenses are not required to obtain and possess firearms. The second one is Yemen.

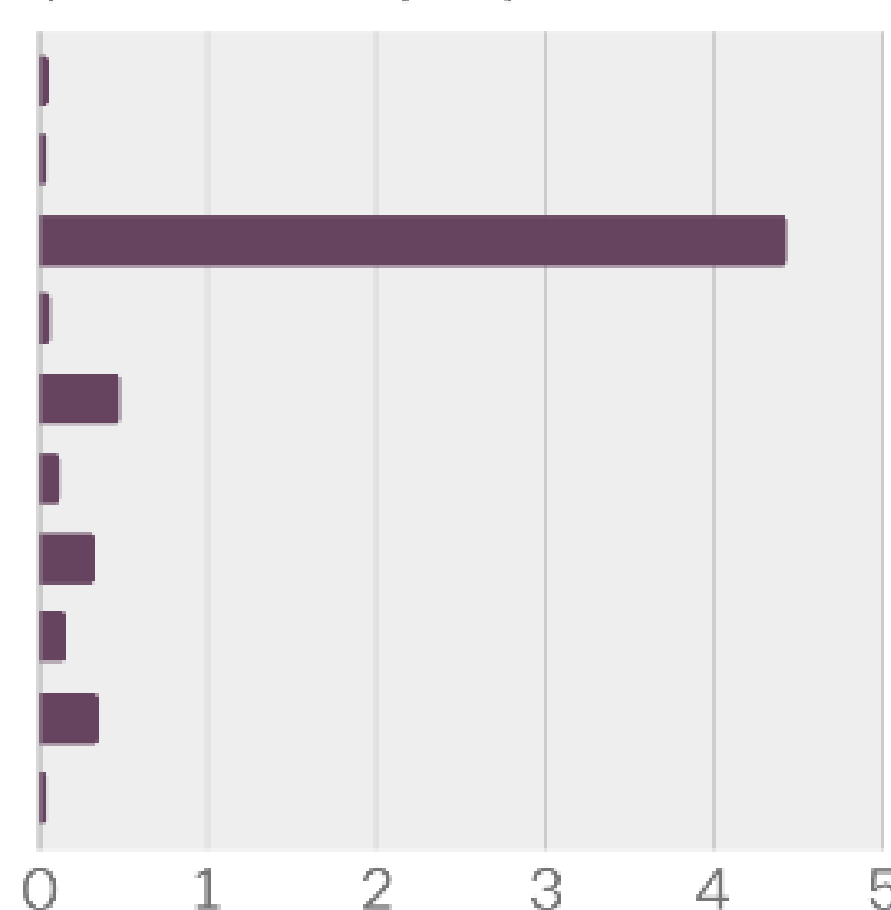
Video game revenue

per-person estimate for 2019



Violent gun deaths

per 100,000 people in 2017



Violent gun death data from the Institute for Health Metrics and Evaluation; video game revenue data (which does not include hardware sales) from Newzoo, a gaming analytics company

Vox

4

Results

We cannot unambiguously say how computer games influence our minds, but there are some things that we can say.

Things that are definitely associated with video games.

- higher grades among boys
- lower alcohol consumption, no history of depression, getting into serious fights and carrying a weapon among girls
- lower smoking and marijuana usage
- higher caffeine consumption
- lower school shootings rate (keeping in mind that it's not totally clear result, because we didn't have enough data for this)
- growth of employment rate (2013-2015)
- high contribution in GDP (2013-2015)

Received χ^2 value and p -value after the chi-squared test of H_0 : the number of persons in each category depends on the number of players. (Example of observed data is above.) Here are some of the aspects of student's life (separately for boys and girls) which are influenced by games. That is if we accept the null hypothesis for "Smoking", it means that the more students play, the less they smoke (based on numbers in table).

Girls

	χ^2	p		χ^2	p
Sip of alcohol, lifetime	7.8700	0.005	Grades Average	6.7393	0.0344
Serious fights	4.9700	0.0258	Smoking, lifetime	29.9100	<0.0001
Sad or hopeless 2+weeks	7.8500	0.0051	Marijuana, lifetime	16.8500	<0.0001

Boys

The conclusions and a **short summary** of results:

- Video games can be related to girls' aggression (or even cause it).
- + They don't cause raise of school shootings and even have negative correlation with its amount.
- + Games are associated with higher grades in school and healthier lifestyle.
- + They also positively affect on economy